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UPDATING SUPPRESSION OF ENEMY AIR DEFENCE IN AUSTRALIAN AIR POWER DOCTRINE

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UPDATING SUPPRESSION OF ENEMY AIR DEFENCE IN AUSTRALIAN AIR POWER DOCTRINE

AIM

1. The Royal Australian Air Force will acquire a potent Suppression of Enemy Air Defence (SEAD) capability with the EA-18G *Growler* aircraft. Air Force doctrine *The Air Power Manual* and *The Operational Air Doctrine Manual* require updating to effectively capture the new capability. The aim of this paper is to address the doctrinal shortfall and present an option for the inclusion of SEAD into the core air power roles in future editions.

INTRODUCTION

2. The EA-18G is based on the F/A-18F Super Hornet with advanced avionics specialising in Electronic Warfare (EW). The United States Navy (USN) received the first Growler from the manufacturer, Boeing, in 2012 and will continue to operate the aircraft as the primary EW platform for the foreseeable future.¹ The first of twelve Growler aircraft for the Australian Air Force completed its first flight in July 2015. The aircraft and associated systems are being procured by the Australian Defence Force (ADF) under project AIR 5349 Phase 3. The project was announced in 2012 with Initial Operational Capability expected in 2018. The three primary capabilities to be provided by the Australian Growler are land strike, maritime strike and counter Integrated Air Defence Systems (IADS).² The program represents a significant leap in Air Force operations within Force Level Electronic Warfare (FLEW) and its ability to cooperate with other services and government agencies through exploitation of the electromagnetic spectrum. To

¹ Boeing, "EA-18G Growler," accessed on 26 January 2016, <http://www.boeing.com/defense/ea-18g-growler/>.

² Royal Australian Air Force, Air 5349 Phase 3, *EA-18G Growler Capability Realisation Plan*, V3.0 (Canberra: Air Combat Transition Office, Department of Defence, 2014), 19.

maximise understanding and interoperability the primary roles of Growler must be effectively covered in Air Force doctrine.

3. Both Air Force philosophical level doctrine and the application level doctrine require updating to reflect the new unique capabilities that the Growler brings to Australian air power. *The Air Power Manual* 6th edition published in 2013, is the Air Force capstone doctrine which requires expansion of the sub-role of Offensive Counter Air (OCA) to capture the critical value of SEAD. There is also an absence of historical suppression operation lessons and an Air Force definition of SEAD in the glossary.³ At the application level, *The Operational Air Doctrine Manual* has only one paragraph dedicated to SEAD and is outdated in terminology.⁴ As the Air Force continues to rapidly develop in the information age it is essential that doctrine maintains pace with the advances. The organisation must change its perspective of SEAD from a customer to one of a key deliverer of the capability.

4. The role of the Australian Growler will be analysed with regard to plans for a network centric Air Force. The doctrine of key allies, in particular the United States (US), will be referenced for content and uniformity. Recommendations will be provided for future editions of Air Force doctrine to effectively capture the role of SEAD. Australia is venturing into a niche capability with the Growler, the key to maximising the potential begins with doctrine.

DISCUSSION

5. The Growler will provide the ADF with a potent FLEW capability. The project is the only Foreign Military Sales of the Growler by the US and is significant for the level of

³ Royal Australian Air Force, AAP 1000-D, *The Air Power Manual*, 6th ed. (Canberra: Air Power Development Centre, Department of Defence, 2013), 53, 233.

⁴ Royal Australian Air Force, AAP 1002, *The Operational Air Doctrine Manual*, 2nd ed. (Canberra: Air Power Development Centre, Department of Defence, 2006), 4-18.

cooperation required between the two allies to develop and maintain the capability. The exchange of information, tactics and personnel with our key military ally will further strengthen the defence relationship. The new EW will significantly enhance the ADF's contribution to coalition operations. These capabilities are in demand throughout the entire spectrum of conflict and even amongst US forces such potent EW assets are considered "Low Density/High Demand."⁵ A noteworthy example was the 2011 Libya air campaign in which the US provided all EW aircraft operating over Libyan territory. The ability for Australia to support coalition operations with the latest technology is significant.

6. The Growler is the most advanced airborne electronic attack aircraft available, capable of operating autonomously or part of a greater strike package against air, land and sea targets. The key roles of the Growler are Electronic Support (ES) and Electronic Attack (EA) against adversary communications and radar systems. The Growler will enhance the ADF ability to detect, analyse and identify electronic emissions through ES. A significant increase in ADF capability will be the ability to employ EA by disrupting, deterring or destroying an adversary's electromagnetic systems. Anti-radiation missiles (ARMs) will be carried by the Growler enabling kinetic destruction of certain radars.⁶ With such an array of kinetic and non-kinetic applications, the Growler is expected to support multiple government agencies and spearhead the network centric future Air Force.

7. Growler will be an integral part of the Air Force's Plan Jericho. The plan is currently being implemented and provides the vision "to develop a future force that is agile and adaptive,

⁵ United States, Report to Congress, *Kosovo / Operation Allied Force After-action Report* (Washington, DC: U.S. Government Printing Office, January 31, 2000), 66.

⁶ Royal Australian Air Force, Air 5349 Phase 3, *EA-18G Growler Capability Realisation Plan*, V3.0 (Canberra: Air Combat Transition Office, Department of Defence, 2014), 19.

fully immersed in the information age and truly joint.”⁷ Growler provides an initial look at the future opportunities and delivers cross-domain capabilities for both military and other government agencies. It also provides the ADF a means to support military partners within the region and beyond with a niche capability. The USN’s plan for 2025 incorporates the Australian capability into the future Growler network.⁸ Correct doctrine is an important part of not only integration with allies, but also a joint and networked Air Force. It must be accurate and current “to assist Air Force personnel, members of other Services, and our partners in national security to gain the understanding necessary to generate, employ and sustain military air power.”⁹ Several changes are required to the doctrine in order to maximise this understanding.

8. *The Air Power Manual* requires a change in philosophy. This is based on the notion that the capstone doctrine is itself philosophical and “explains broad fundamental principles.”¹⁰ The emergence of FLEW is effectively captured and incorporated through previous amendments. The concepts of ES and EA are sufficiently defined and explained under the air power sub-role of electronic warfare.¹¹ When combined with the sub-role of information operations, the Growler operational capabilities of land and maritime strike in the electromagnetic spectrum are adequately covered. The deficiency is in the third primary role of Growler; counter IADS. The sole mention of SEAD in the entire manual is “OCA missions can involve fighter sweep and the suppression of enemy air defences.”¹² Considering Australia is well into the process of acquiring

⁷ Royal Australian Air Force, *Plan Jericho Booklet* (Department of Defence, 2014), 4.

⁸ United States Navy, *Naval Aviation Vision 2014-2025* (Naval Aviation Enterprise, 2014), 27.

⁹ Royal Australian Air Force, AAP 1000-D, *The Air Power Manual*, 6th ed. (Canberra: Air Power Development Centre, Department of Defence, 2013), 3.

¹⁰ *Ibid.*, 5.

¹¹ *Ibid.*, 61.

¹² Royal Australian Air Force, AAP 1000-D, *The Air Power Manual*, 6th ed. (Canberra: Air Power Development Centre, Department of Defence, 2013), 53.

one of the most capable platforms for SEAD a philosophical change is required to ensure the new capability receives the recognition it demands.

9. *The Operational Air Doctrine Manual* was last updated in 2006, several years prior to the Growler announcement. The publication is the keystone doctrine of the Air Force and “explains the use of fundamental air power principles.”¹³ Long standing roles of the Air Force are explained in some detail and each sub-role is broken down further into base components. The coverage of SEAD is contained within one paragraph and lacks a formal definition.¹⁴ The perspective of the paragraph is biased toward a legacy force requiring SEAD support rather than one employing SEAD capability. This is a function of time since the last publication amendment. It is also noticeable that the concept of FLEW is not addressed at the application level in the electronic warfare section; however this is outside the scope of this paper.¹⁵ Ten years have passed since operational doctrine was last updated and revision is required in order to incorporate the SEAD component. An analysis of overseas doctrine is required to ensure Air Force application reflects contemporary practices.

10. US Joint Publication 3-01 *Countering Air and Missile Threats* is the US doctrinal authority on SEAD and dedicates over four pages to the subject. It defines SEAD as “activity that neutralizes, destroys, or temporarily degrades surface-based enemy air defenses by destructive and/or disruptive means.”¹⁶ The importance of SEAD is explained, the threats it is countering are listed and explanations of the different execution categories of SEAD are given. The consolidated, detailed operational knowledge of SEAD is the result of employing the

¹³ *Ibid.*, 7.

¹⁴ Royal Australian Air Force, AAP 1002, *The Operational Air Doctrine Manual*, 2nd ed. (Canberra: Air Power Development Centre, Department of Defence, 2006), 4-18.

¹⁵ *Ibid.*, 4-8. The EW section highlights the need for electronic self-protection, but does not effectively cover the offensive capabilities of electronic attack or the ability to provide force level protection.

¹⁶ Joint Chiefs of Staff, *Countering Air and Missile Threats*, JP 3-01 (Washington, D.C.: Joint Chiefs of Staff, 2012), IV-12.

principles over many decades. The US Navy first operated the EA-6B Prowler, predecessor to the Growler, in 1971 and the US Air Force has employed the F-16CJ as its primary SEAD aircraft since the early 1990's.¹⁷ Interestingly, the Royal Canadian Air Force which does not have dedicated SEAD aircraft in its inventory has three pages of aerospace doctrine dedicated to SEAD.¹⁸ Air Force doctrine has fallen behind allies in effectively capturing the SEAD operational capability.

11. Expansion on SEAD concepts is required in both capstone and keystone doctrine of the Air Force. Suppressing air defence has been essential in modern air campaigns against credible air threats in order to employ offensive air power. On the first day of the 1991 Gulf War EA-6 Prowlers lead the penetration of air defences for coalition strikes into southern Iraq, twenty years later they did the same for the first wave of strikers into Libya.¹⁹ US, British and Canadian doctrine place SEAD within Offensive Counter Air (OCA) operations Control of the Air.²⁰ This is consistent with Air Force doctrine and should be maintained. The placement is correct, the content requires updating. The following paragraphs contain the recommendations for future editions of Air Force doctrine.

¹⁷ United States Navy, "Fact File: EA-6B Prowler Electronic Warfare Aircraft," last modified 5 February 2009, http://www.navy.mil/navydata/fact_display.asp?cid=1100&tid=900&ct=1. United States Air Force, "Fact Sheets: F-16 Fighting Falcon," last modified 23 September 2015, <http://www.af.mil/AboutUs/FactSheets/Display/tabid/224/Article/104505/f-16-fighting-falcon.aspx>.

¹⁸ Canada, Department of National Defence, B-GA-403-000/FP-001, *Canadian Forces Aerospace Shape Doctrine*, 1st ed. (Trenton: Canadian Forces Aerospace Warfare Centre, 2014), 28-30.

¹⁹ United States, Report to Congress, *Conduct of the Persian Gulf War* (Washington, DC: U.S. Government Printing Office, April 1992), 159. United States Navy, *Naval Aviation Vision 2014-2025* (Naval Aviation Enterprise, 2014), 26.

²⁰ Joint Chiefs of Staff, *Countering Air and Missile Threats*, JP 3-01 (Washington, D.C.: Joint Chiefs of Staff, 2012), IV-12. United Kingdom, Royal Air Force, AP 3000, *British Air and Space Power Doctrine*, 4th ed. (Shrivenham: Centre for Air Power Studies, 2009), 39. Canada, Department of National Defence, B-GA-403-000/FP-001, *Canadian Forces Aerospace Shape Doctrine*, 1st ed. (Trenton: Canadian Forces Aerospace Warfare Centre, 2014), 27.

RECOMMENDATIONS

12. A specific definition for Suppression of Enemy Air Defence should be included in the glossary of *The Air Power Manual*. *The Operational Air Doctrine Manual* discusses the concept of D/SEAD, which it defines as “operations that aim to destroy or temporary degrade enemy ground-based air defence in a specified area or for a specified time, normally in support of an attack force.”²¹ The ‘D’ stands for destruction and should be removed; it is not utilised in partner doctrine and a new definition of SEAD encompasses the destruction aspect. The time and area component should be removed as these concepts are inherent in Control of the Air missions. The new definition should maintain its Air Force identity by being consistent with OCA concepts; however it must also remain relevant to a joint environment. The new definition should be; ‘Suppression of Enemy Air Defence (SEAD): an activity conducted to destroy, degrade, neutralise or disrupt adversary surface-based air defences’.

13. *The Air Power Manual* should list the four primary OCA missions. These are OCA attack, sweep, force protection and SEAD.²² The current publication mentions only two by stating “OCA missions can involve fighter sweep and SEAD.”²³ Listing all four will bring it in line with subsequent sections in the manual such as ‘Air Campaigning’ under ‘Command and Control’.²⁴ US doctrine also lists all four and consideration should also be given to aligning the

²¹ Royal Australian Air Force, AAP 1002, *The Operational Air Doctrine Manual*, 2nd ed. (Canberra: Air Power Development Centre, Department of Defence, 2006), 4-18.

²² Royal Australian Air Force, AAP 1002, *The Operational Air Doctrine Manual*, 2nd ed. (Canberra: Air Power Development Centre, Department of Defence, 2006), 4-17.

²³ Royal Australian Air Force, AAP 1000-D, *The Air Power Manual*, 6th ed. (Canberra: Air Power Development Centre, Department of Defence, 2013), 53.

²⁴ *Ibid.*, 82.

four missions' nomenclature exactly with US doctrine; attack, fighter sweep, fighter escort and SEAD.²⁵

14. *The Air Power Manual* should include an account of historical SEAD operations. The difference in SEAD success during Operations Desert Storm and Allied Force could be utilised as follows; 'Desert Storm and Allied Force SEAD contrast. Desert Storm aircraft striking Baghdad were penetrating an IADS second only in complexity to the one around Moscow. Coalition planners had the advantage of known Iraqi IADS locations and doctrine allowing air defence assets to be attacked with jammers, anti-radiation missiles and bombs. By the end of the fourth day air defence radar emissions were reduced by 95 per cent and coalition aircraft were able to operate with almost complete freedom of action. During Operation Allied Force, NATO faced a smaller, but much more resilient IADS with Serbian forces well versed in US SEAD tactics. Serbian IADS remained intact and a credible threat throughout the 78 day campaign by employing defensive dispersion and emission control tactics. Bombing missions could continue, however SEAD aircraft made up 30 per cent of strike packages. NATO lost only two aircraft from over 800 surface-to-air missiles launched. Despite an inability to destroy the Serbian IADS, when comparing combat losses to sorties, NATO aircrew were six times less likely to be shot down than aircrew in Desert Storm.'²⁶ These are just two campaigns where SEAD was vital for control of the air.

15. *The Operational Air Power Doctrine Manual* requires significant expansion to effectively encompass the SEAD role. All reference to Destruction of Enemy Air Defence should be

²⁵ Joint Chiefs of Staff, *Countering Air and Missile Threats*, JP 3-01 (Washington, D.C.: Joint Chiefs of Staff, 2012), IV-9.

²⁶ Canada, Department of National Defence, B-GA-403-000/FP-001, *Canadian Forces Aerospace Shape Doctrine*, 1st ed. (Trenton: Canadian Forces Aerospace Warfare Centre, 2014), 30. United States, Report to Congress, *Conduct of the Persian Gulf War* (Washington, DC: U.S. Government Printing Office, April 1992), 158-160. United States, Report to Congress, *Kosovo / Operation Allied Force After-action Report* (Washington, DC: U.S. Government Printing Office, January 31, 2000), 65.

removed as stated previously. The following paragraphs are a recommendation for updating SEAD in the application level Air Force doctrine. The sources used for reference are US Joint doctrine and Canadian Forces Aerospace doctrine.

16. SEAD encompasses operations conducted to destroy, degrade, neutralise or disrupt adversary surface-based air defences. Specialised weapons and systems are employed, often in conjunction with other air operations in an air defence environment (i.e. OCA attack, air interdiction). Options for SEAD include passive measures such as emission detectors and reduced signature technology, active measures such as Electronic Attack (EA) and Electronic Counter Measures (ECM), and destructive means such as Anti-Radiation Missiles (ARMs) and precision weapons. In joint operations, SEAD may be conducted by Special Operations Forces (SOF), direct and indirect fire from land or sea based forces and surface based EW assets. A high level of coordination is required with regard to ISR, planning, package integration and targeting information. Additionally, EA operations should not conflict with friendly use of the electromagnetic spectrum.²⁷

17. SEAD operations can be divided into three categories.
- a. Area Suppression. Suppression of specific systems throughout the Area of Responsibility (AO). Critical nodes, such as C2, are targeted using kinetic or non-kinetic means to maximise suppression.
 - b. Localised suppression. Operations confined to geographic areas for specific times often associated with transit routes or target locations. SEAD aircraft may operate

²⁷ Joint Chiefs of Staff, *Countering Air and Missile Threats*, JP 3-01 (Washington, D.C.: Joint Chiefs of Staff, 2012), IV-12, 15. Canada, Department of National Defence, B-GA-403-000/FP-001, *Canadian Forces Aerospace Shape Doctrine*, 1st ed. (Trenton: Canadian Forces Aerospace Warfare Centre, 2014), 28.

as attached or detached escorts in close proximity to the strike package and is further defined by adversary detection and engagement capabilities.

- c. Opportune suppression. Any unplanned suppression in self or package defence or on targets of opportunity. Mobile threats are the most likely targets of opportune suppression. Due to the short timeframe associated with ‘pop up’ surface-to-air threats, identification and ROE procedures must be robust to prevent fratricide and ensure the commander’s priorities are met.²⁸

CONCLUSION

18. The recommendations provided in this paper ensure SEAD is effectively encompassed within Australian air power doctrine. The ADF has acquired the most advanced SEAD platform with the Growler, yet doctrine lags behind. The capstone philosophical doctrine and the keystone application level doctrine should be amended to attain uniformity with allies and maximise the lessons from partners employing SEAD over several decades. The most notable gaps are the lack of an Australian definition for SEAD and more detailed operational level information to further develop knowledge of the role. The Growler will provide an opportunity for the Air Force to contribute a high demand asset to coalition and whole of government operations, a situation that is likely to remain for some time. Clear and comprehensive doctrine is the first step in maximising its employment.

²⁸ Joint Chiefs of Staff, *Countering Air and Missile Threats*, JP 3-01 (Washington, D.C.: Joint Chiefs of Staff, 2012), IV-13-15. Canada, Department of National Defence, B-GA-403-000/FP-001, *Canadian Forces Aerospace Shape Doctrine*, 1st ed. (Trenton: Canadian Forces Aerospace Warfare Centre, 2014), 29.

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