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EXERCISE/EXERCICE NEW HORIZONS

**OPERATIONAL LEVEL AEROSPACE POWER:
A MATTER OF PROFESSIONAL MASTERY FOR THE
ROYAL AUSTRALIAN AIR FORCE**

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ABSTRACT

Air forces have traditionally been focused on aircraft and aircrew rather than the development of a holistic air power capability to support the joint campaign. Specifically, air forces do not have a 'combined arms' focus but instead are 'a community of communities', that is, fighter pilots, maritime aircrew, intelligence officers and technicians, etc. In the current operational level construct, Headquarters Australian Theatre has an air component commanded by a Joint Force Air Component Commander (JFACC) who is supported by a Joint Air Operations Centre (JAOC). This situation is replicated at Joint Task Force (JTF) level with a Commander JTF and JTF JFACC and JAOC. Therefore, there are many opportunities for Royal Australian Air Force (RAAF) officers to function at the operational level of war and apply the Operational Art. However, the RAAF's ability to adequately operate within this construct, and provide professional aerospace focused support to the joint campaign is limited as the RAAF has no JFACC or JAOC education and training, and its officers are not instilled with an aerospace oriented Operational Art.

The intent of the paper is to show that the RAAF is not capable of achieving *professional mastery* at the operational level of war, until it establishes an appropriate infrastructure to develop aerospace doctrine, conduct aerospace warfare training and education, and instil the Operational Art in its officers. This paper therefore proposes that the RAAF develop an institution that would be the equivalent of the Royal Air Force Air Warfare Centre, the United States Air Force College of Aerospace Doctrine, Research and Education or the Command and Control Warrior School. This institution would be called the RAAF Centre for Aerospace Warfare (CAW).

INTRODUCTION

War is a matter of vital importance to the State, the province of life or death, the road to survival or ruin. It is therefore mandatory that it be thoroughly studied.

Sun Tzu

Noted Royal Australian Air Force (RAAF) Official Historian, Dr Alan Stephens, in his paper titled 'Command, Leadership and Aerospace Power', stated that:

According to the Australian Army's web site, in comparison to their Air Force and Navy counterparts, Army officers have a greater depth of understanding of the relationship between strategy and tactics, especially at the operational level of war, and they are probably more predisposed towards joint operations. Noting in passing my admiration for the boldness of that statement in an era of grim, omnipotent joint thought-police, I believe it raises some important and legitimate issues, albeit perhaps unintentionally. Put simply, I infer from that passage that the authors believe army officers make better joint force commanders than air force and navy officers.¹

This raises interesting debate over the ability of air forces in general, but specifically the Royal Australian Air Force (RAAF), to operate with skill and vision at the operational level of war. The operational level of war is defined as the 'level of conflict [that] is concerned with the planning and conduct of campaigns. It is at the level that military strategy is implemented by assigning forces, tasks and resources to tactical operations.'² Additionally, the design and prosecution of campaigns and operations is dependent upon how commanders apply Operational

¹ Stephens, Dr Alan, 'Command, Leadership and Aerospace Power', in Brent, Wing Commander Keith (eds), Air Power and Joint Forces - 2000 Air Power Conference, RAAF Aerospace Centre, RAAF Base Fairbairn, ACT, 2600, August 2000, p 171. (Dr Stephens took this information from the Project Opera (Officer Professional Effectiveness Review for the Army), Submission 1 – Review Report, paragraph 34, <http://www.army.gov.au/>, May 2000).

² Australia, Australian Defence Force Publication 6 - Operations, Australian Defence Warfare Centre, RAAF Williamstown, NSW, 11 November 1998, Glossary, p 3.

Art, which is defined as ‘the skilful employment of military forces to attain strategic goals through the design, organisation, sequencing and direction of campaigns and major operations.’³

To understand how air forces function, it is important to address the concept of *professional mastery*. Professional mastery is defined in *The Air Power Manual* as ‘the discipline of striving continually to achieve the most appropriate, effective and efficient air power for Australia’s security.’⁴ Professional mastery ‘requires a comprehensive understanding of a profession’s body of knowledge and the recognised ability to apply that knowledge in the pursuit of a mission.’⁵ Professional mastery therefore relies on education and training in formal and informal environments, private study, and experience. Of note, *The Air Power Manual* stresses the understanding of aerospace doctrine within the joint environment but qualifies this by stating that the ‘development of specialist single Service war-fighting skills remains a prerequisite to the conduct of joint operations’ in the Australian Defence Force (ADF).⁶ It is therefore acknowledged that the first task of the Service is to develop professional mastery of its own environment before developing professional mastery in a joint one.

How then do air forces instil operational level professional mastery in their officer corps? Air forces have traditionally been focused on aircraft and aircrew rather than the development of a holistic air power capability to support the joint campaign. Air force commanders, for example, are invariably pilots, but always aircrew, and on average constitute approximately 15

³ Ibid, p 3-1.

⁴ Australia, AAP 1000, The Air Power Manual (Third Edition), RAAF Aerospace Centre, RAAF Base Fairbairn, ACT, 2600, 1998, p 5.

⁵ Ibid, p 5.

⁶ Ibid, p 6.

percent of an average modern air force.⁷ An interesting difference between air force and army commanders, as observed by Dr Alan Stephens, is that while army commanders write their memoirs concentrating on their command decisions and leadership challenges, air force commanders concentrate on the flying exploits of their youth.⁸ Additionally, unlike armies, air forces do not have a 'combined arms' or 'all arms' focus, but are instead 'a community of communities' that often operate independently of one another for much of the time. These communities include fighter pilots, maritime and transport aircrew, intelligence officers, airspace surveillance and control officers, logisticians and technicians to name only a few. It should be noted that the 2000 Australian Defence White Paper recently emphasised that:

Capability is much more than just a piece of equipment. It includes everything that contributes to the ADF's ability to achieve a particular result at a particular time. That means it encompasses personnel and their training, support and maintenance, logistics, intelligence, doctrine, and many other contributing elements.⁹

Despite the *Air Power Manual's* statement that single Service doctrine must be mastered before joint doctrine, the RAAF relies totally on joint institutions to provide its operational level education and training. The RAAF's ability to operate with skill and vision at the operational level of war is limited as the Service provides no formal Joint Force Air Component Commander (JFACC) or Joint Air Operations Centre (JAOC) training. The JFACC is the operational level aerospace commander and the JAOC contains the JFACC's key logistics, plans, operations, communications and intelligence staffs. The JAOC is therefore where aerospace Operational Art is applied by the JFACC.

⁷ Stephens, Dr Alan, 'Command, Leadership and Aerospace Power', p 181.

⁸ Ibid, pp 181-182.

⁹ Australia, Defence 2000: Our Future Defence Force. Commonwealth of Australia, December 2000, p 54.

‘An organisation can only be as good as its ideas, which themselves must be formalised, codified, and widely understood.’¹⁰ Learning institutions are therefore key to the intellectual strength of military organisations. This paper will show that in order to develop the level of professionalism required of modern war fighting at the operational level of war, the RAAF should create an institution devoted to such doctrine, training and education. This organisation would be akin to the Royal Air Force (RAF) Air Warfare Centre (AWC), the United States Air Force (USAF) College of Aerospace Doctrine, Research and Education (CADRE) or the USAF Command and Control Warrior School (C2WS). To do this, the paper will analyse why the RAAF requires such an institution, describe the current RAAF and ADF operational level education and training structures, describe the way in which the US and UK have addressed similar issues, and lastly, recommend a way ahead for the RAAF to achieve what should be its operational level end state.

PROFESSIONAL MASTERY – THE PAST AND PRESENT

War is not an affair of chance. A great deal of knowledge, study, and meditation is necessary to conduct it well.

Frederick the Great

When the RAAF was created 80 years ago in 1921, its first Chief of Air Staff, Sir Richard Williams, faced the problem of how to establish his young service as an equal, or ‘third brother’, to the army and navy. A key aspect of this work was the establishment of a training and education system to produce officers, pilots, and technicians. While this work stood the

¹⁰ Stephens, Alan, Power Plus Attitude, Brisbane, 1992, p 182.

RAAF in great stead for the forthcoming Second World War at the tactical level, it did not prepare its leaders for their roles as operational level commanders in complex and dynamic theatres of war. Of note, the only RAAF officer to hold command at the operational level during Second World War was Air Vice Marshal W.H. Bostock, Commander of RAAF Command, who in turn was under the command of General George Kenney, a US officer, in his capacity as Commander Allied Air Forces in the Southwest Pacific Theatre. Few RAAF officers have achieved operational level command since, particularly during combat operations. Further, perhaps the only air campaign plan that has ever been developed by the RAAF during wartime was that used in Operation OBOE against Japanese forces on the island of Borneo in 1945.¹¹

In the current ADF operational level construct, Headquarters Australian Theatre (HQAST), in addition to having a two star joint commander and staff, has an air component commanded by a two star Joint Force Air Component Commander (JFACC) who is supported by a Joint Air Operations Centre (JAOC).¹² This situation is replicated at Joint Task Force (JTF) level where there would also be a JFACC and JAOC. Therefore, many opportunities now exist for RAAF officers to function at the operational level of war and practice the Operational Art. As a result, the RAAF must develop personnel skilled both in the Operational Art and in the use of air battle planning and management systems. These personnel and systems must be managed as a complete 'weapon system' just the fighter weapon system comprises F/A-18 Hornet aircraft, weapons, fighter pilots, technicians, etc. Of note, the USAF announced on 8 September 2000

¹¹ For further information see, Waters, Gary. OBOE - Air Operations Over Borneo 1945. Air Power Studies Centre, Canberra, ACT, 1995.

¹² Treloar, Air Vice Marshal Robert, 'The Australian Theatre', in Brent, Wing Commander Keith (eds). Air Power and Joint Forces - 2000 Air Power Conference. Aerospace Centre, RAAF Base Fairbairn, ACT, 2600, August 2000, pp 137-146.

that the JAOC was now an official weapon system, technically equal in status to the B2 Stealth Bomber or F-22 Air Dominance Fighter.¹³ Additionally, '[s]pecial emphasis is being placed [by the USAF] on giving the officers who will serve as air component commanders during future conflicts the education and training they'll need to make the most effective use of the equipment that will be at their disposal...in order to maximise the war fighting contribution of aerospace forces.'¹⁴

The 2000 Australian Defence White Paper states that Australia's most important long term strategic objective is the defence of Australian territory from attack.¹⁵ The White Paper also states that Australia must be self-reliant, adhere to a maritime strategy, retain the ability to undertake proactive operations, and contribute to regional and international coalitions.¹⁶ This strategy emphasises the ability to control the air and sea approaches to Australia, to strike the adversary even if distant from Australian shores, to conduct joint operations in Australia's near region, and, if required, to take the lead in regional coalitions. Additionally, the White Paper states that any Australian commitment to an international coalition in high intensity operations will be by committing sophisticated and interoperable air or naval forces.¹⁷ Aerospace power is key to all of these requirements and therefore RAAF personnel may be required to not only fill positions in Australian JAOCs, but also in coalition ones. As coalition JAOCs will almost certainly rely heavily on USAF personnel, who are now in receipt of special training and

¹³ Alford, Technical Sergeant Stefan. 'AOC declared official weapons system' Air Force News, 12 Sep 2000.

¹⁴ Roos, John, 'Effects Based Operations: US Air Force Chief Assesses A Decade of Transformation', Armed Forces Journal International, March 2001, p 70.

¹⁵ Defence 2000: Our Future Defence Force, pp 29-32.

¹⁶ *Ibid*, pp 46-52.

¹⁷ *Ibid*, p 52.

education in JAOC procedures, it stands to reason that RAAF personnel must be similarly trained if they are to be provided as part of the Australian commitment. To provide untrained or poorly trained personnel would have a detrimental effect on Australia's prestige. Furthermore, if Australia provides tactical forces to serve under coalition command, then Australia will require representation at the operational level of war so as to ensure that its forces are operating within the intent and direction of the Australian Government, and also to ensure that they are not being misapplied.

The way in which the RAAF contributes to joint and combined campaigns and operations is key to the Service's success at the operational level of war. This contribution is not only predicated on platforms and weapons, but on holistic capability with an emphasis on how the RAAF fights as a whole, as against individual units or personnel. The command and control capabilities of the JFACC/JAOC mix are integral components of this capability. Too often the RAAF has had a technocratic or platform-centric view of aerospace power. For example, Alan Stephens, when describing the establishment of the RAAF College, later to be named the RAAF Academy, states that:

it seems extraordinary that [in a four year course] there was no formal, discrete course on the history of aerospace power: apparently any knowledge of the RAAF's fundamental business was to be acquired by intensive study of its technical components rather than its history and ideas. The RAAF was identifying itself as a narrow technocracy.¹⁸

Although the RAAF College/Academy was never designed to produce operational level commanders, it is clear that the technical aspect to its curriculum overrode the requirement to

instil a sense of Service and aerospace history. The corollary of this is that the RAAF has for the majority of its existence valued technical competence over skill at employing the Operational Art.

Throughout its history, and in spite of significant combat experience and liaison with other modern air forces, it seems that there has been no thought given to establishing a single RAAF institution responsible for the gamut of aerospace doctrine, training and education. Instead, the RAAF, over time, has developed a conglomeration of centres, schools and operational units, each with a mixed ability to conduct training and develop doctrine. Additionally, the RAAF has relied on joint, non-aerospace, focused warfare institutions such as the Australian Defence Force Warfare Centre (ADFWC),¹⁹ and command and staff colleges such as the Australian Command and Staff College (ACSC),²⁰ to instil Operational Art and educate officers in the operational level of war. Despite its doctrine, the RAAF has therefore almost completely abrogated its responsibility to train its personnel beyond the technical or basic level. As a result, the RAAF's ability to adequately operate within the operational level of war and provide professional aerospace focused support to the joint campaign is limited as the Service

¹⁸ Stephens, Alan, Going Solo: Royal Australian Air Force 1946-1973, Australian Government Publishing Service, Canberra, ACT, 2600, 1995, p 122.

¹⁹ The ADFWC is a joint service unit established to study, develop, teach, promulgate and provide advice on joint warfare doctrine, procedures and tactics. The Centre produces Australian Defence Force Publications (ADFP) to promulgate strategic and operational level, joint and combined warfare, doctrine. The ADFWC also conducts general education and job specific training in the concepts of joint warfare. Approximately forty courses, seminars or study periods are conducted each year with a total of more than two thousand participants. Key ADFWC courses are the Joint Operations Planning Course (JOPC), Joint Information Operations Planning Course (JIOPC) and the Joint Targeting Course (JTC). (Information taken from the Australian Defence Force Warfare Centre web site at <http://www.adfwc.org.au/> on 30 January 2001).

²⁰ In 2001 the Army, Navy and RAAF Command and Staff Colleges amalgamated to form the Australian Command and Staff College (ACSC) in Canberra. The ACSC course is joint in nature and is structured into three terms; term one will be a 21 week common component; term two will be a 13 week single Service component; and, term three will be an eight week joint operations component. The course is aimed at mid-seniority squadron leaders and their army and Navy equivalents. (Information taken from the Australian Command and Staff College web site at <http://www.defence.gov.au/acsc/> on 23 March 2001).

has no formal JFACC or JAOC training and its commanders are not instilled with an aerospace oriented Operational Art. Whilst the RAAF lacks appropriate courseware, it does have a sound doctrinal basis for air campaigning.

General Curtis LeMay once stated that ‘at the very heart of warfare lies doctrine. It represents the central beliefs for waging war in order to achieve victory.’²¹ The RAAF defines military doctrine as ‘the fundamental principles by which military forces guide their actions in support of national objectives.’²² Military doctrine is derived from: ‘the lessons of the history of war; theory, which is the outcome of strategic thought; and, demonstrated or desired technological developments.’²³ Like most modern air forces, the RAAF recognises three levels of aerospace power doctrine, strategic or basic, operational, and, tactical. ‘Basic air power doctrine establishes the fundamental philosophies for the employment of air power,’²⁴ operational level doctrine describes how the RAAF will plan and conduct air campaigns and operations, and tactical air power doctrine provides the tactics, techniques and procedures for the actual conduct of flying operations.²⁵ Whilst the RAAF has embraced these concepts, there is in reality no effect on the ability of the RAAF to conduct an aerospace campaign, other than in purely theoretical terms, as there has never been an institution responsible for aerospace doctrine, training and education. Whilst doctrine exists, there is no institutional mechanism for

²¹ Quoted in Fedorchak, Major Scott A, ‘Air Operations Must Be Joint’, [Aerospace Power Journal](#), Air University, Maxwell Air Force Base, Alabama, Spring 1995, p 4.

²² [The Air Power Manual \(Third Edition\)](#), p 2.

²³ Ibid, p 2.

²⁴ Ibid, p 4.

²⁵ The Aerospace Centre at RAAF Base Fairbairn, Canberra, is charged with the development of strategic aerospace doctrine. This has been done principally through the *AAP 1000, The Air Power Manual*, which is now in its third edition in 12 years. Operational level doctrine is the responsibility of Headquarters Air Command (HQAC), the HQAST Air Component. In 1999, HQAC published the RAAF’s first operational air power doctrine titled *AAP 1002, Operational Air Power Manual*. Tactical air power doctrine is the responsibility of the various Force Element

translating the theoretical into the practical. ‘How does one plan an aerospace campaign?’ ‘How does one participate in an JAOC?’ ‘How does one be a JFACC?’ ‘How does one use RAAF specific planning systems such as the Theatre Battle Management Core System (TBMCS)?’²⁶ ‘How does one write an air tasking order?’ ‘How does one employ RAAF specific weapons systems to achieve an operational level effect?’ ‘How does one undertake targeting?’²⁷ At present, these questions do not have standard answers, as all too often the RAAF relies on the experiences of those participating individuals and not their RAAF provided training and education.

To ensure success at the operational level of war, the RAAF requires ‘[a] broad range of functional expertise to support the operations planning and operations management functions. Functional expertise is required in such diverse fields as intelligence, airspace management, logistics, communications, meteorology, oceanography, public information, law of armed conflict and rules of engagement, aeromedical evacuation, joint and single service doctrines, etc.’²⁸ Additionally, the RAAF requires: ‘role specialists in such areas as strike and interdiction in the land and maritime environments, air-to-air and air-to-ground combat, air-to-air refuelling, airborne early warning and control, reconnaissance, maritime patrol, airlift, combat search and rescue, etc.’²⁹ Whilst such broad range experience is required, and in many respects the success

Groups: Tactical Fighter Group (TFG), Strike Reconnaissance Group (SRG), Maritime Patrol Group (MPG), Airlift Group (ALG), Surveillance and Control Group (SCG) and Combat Support Group (CSG).

²⁶ TBMCS is a command and control system that provides a JAOC with shared operations and intelligence databases to facilitate airspace control, air tasking order development, targeting, and battle damage assessment to name only some of its many functions. TBMCS is replacing CTAPS – Contingency Theatre Air Planning System.

²⁷ At present, the only targeting course in the ADF is the Joint Targeting Course (JTC) at ADFWC. The JTC is two weeks long and teaches the joint targeting process in general terms to a joint operations and intelligence audience.

²⁸ Tramoundanis, Wing Commander Despina, Aerospace Centre Paper Number 63: Operational Air Power Doctrine - A Proposal, Aerospace Centre, RAAF Base Fairbairn, ACT, 2600, April 1998, p 12.

²⁹ Ibid, p 12.

of the air campaign will be dependent on it, there is no attempt made by the RAAF to give these personnel a common training thread on how to conduct warfare at the operational level of war.

The one RAAF organisation, however, that has both developed aerospace doctrine and undertaken an aerospace warfare education program, is the Aerospace Centre in Canberra. The Aerospace Centre was formed in August 1989, as the Air Power Studies Centre (APSC), to promote a greater understanding of the proper application of aerospace power within the ADF.³⁰ This it has done through the publication of *The Air Power Manual*, the sponsoring of the biennial Air Power Conference, annual RAAF History Conferences and various regional air power forums. In addition to its doctrine role, the Centre administers the RAAF Historical Section and provides several Chief of Air Force (CAF) Fellowships per year for further studies into aerospace power. Of note, the CAF Fellowship program was recently upgraded to a formal academic research standard where Fellows will be awarded academic qualifications on completion of a short university quality program on aerospace power and a research project of relevance to the RAAF. On completion of the program, the Fellows will be posted to a position where their research will be applied by the RAAF. The intent is to ‘make a difference at the strategic level and develop some thinkers who have an abiding knowledge of air power.’³¹ The Aerospace Centre is, however, generally viewed by the wider RAAF as an academically focused strategic oriented think tank, and the recent refocusing tends to support this thesis. Whilst a think tank is a requirement for any modern military, its product must be tangible and effect the war fighting ability of the Service.

³⁰ The APSC became the Aerospace Centre in June 2000.

The RAAF also conducts a number of aircraft systems courses at the School of Air Navigation (SAN) and Aircraft Research and Development Unit Electronic Warfare Squadron (ARDU EWSQN) which provide tactical level systems training to operations related personnel (aircrew, intelligence and air defence). SAN is primarily responsible for training navigators but also conducts two systems courses: the Weapons Employment Course (WEC) and the Aircraft Integrated Systems Course (AISC). The WEC is a five week course, conducted three times per year, which teaches weapons guidance and delivery theory, and Joint Munitions Effectiveness Manual (JMEM) weaponeering. The AISC is a year long course, with a mix of attendance and correspondence phases culminating in a major paper, and covers such topics as aircraft avionics, electronic warfare and weapon systems. ARDU EWSQN is an operational electronic warfare unit with operational test and evaluation, and threat analysis and library responsibilities. In addition to the aforementioned roles, the Squadron conducts a four week Electronic Warfare Course (EWC) five times per year, which is aimed at producing personnel capable of performing duties in support of EW operations. Most importantly, however, these courses are not the reason for the existence of either unit, as SAN is responsible for navigator training and ARDU EWSQN is a tactical level electronic warfare unit with 'real world' responsibilities. Of note, the SAN and EWSQN systems courses are often mistaken for operational level training in the current void of such training.

Remembering the opening statement of this essay by Mr Alan Stephens, it is pertinent to discuss the Australian Army's approach to combined arms officer training and education. In addition to the joint ACSC, the Army has a progression of courses to develop the combined arms

³¹ MacFarling, Ian, Group Captain, 'New Style Fellowships at the Aerospace Centre', [Air Force News](#), Volume 43,

understanding of its officers. These courses include the Combined Arms Advanced Course (CAOC), Intermediate Staff Course (ISC), Intermediate Operations Course (IOC), and Advanced Operations Course (AOC). Officers of the rank of senior captain/junior major attend the CAOC, ISC and IOC courses, while the AOC is attended by lieutenant colonels. The Army also has the Combined Arms Training and Development Centre (CATDC) at Puckapunyal, Victoria, where land warfare specific capability development, doctrine and battlefield simulation are undertaken, and the Land Warfare Studies Centre (LWSC) in Canberra, which is akin to the Aerospace Centre.³²

The Australian Army therefore has a suite of courses which emphasise the ‘combined arms battle’. While these courses are, with the exception of ACSC, focused on the tactical level of war, they do provide army officers with the professional mastery of their own force and its tactics before they go on to develop professional mastery in the joint environment. Additionally, the Army has doctrine and research facilities of its own to develop Australian land warfare doctrine and procedures. The RAAF on the other hand has no such equivalent of the LWC or CATDC, and instead relies on joint education and systems training to provide the necessary skill base for planning and conducting air operations.

As was noted in the 2000 Defence White Paper, people and their training constitute an important element of capability. Whilst the RAAF provides excellent specialist training to its personnel, it lags behind in the conduct of combined arms operational level training. The Australian Army, on the other hand, has managed to achieve this task. One of the key factors

that has militated against the recognition of the requirement for a RAAF institution to instil Operational Art is the reality that ‘the RAAF has not been involved in war or war like operations for over 25 years.’³³ Operations such as Operation Stabilise in East Timor from 1999 to the present, while a Chapter 7 United Nations (UN) operation, do not constitute the sort of operational level environment where complex air campaign plans are developed and executed. Whilst a JAOC was established at Darwin to control, and a RAAF air commodore appointed to command, combined air operations, the level of complexity was not the same as that which would be expected during a war, even though airlift and photographic reconnaissance operations were conducted.³⁴ The RAAF cannot afford to wait for a war to recognise the importance of developing an institution to develop the aerospace Operational Art in its personnel as an air force the size of the RAAF must fight and think smart. This is because there is little operational depth in such a small force and poor operational level decisions or inefficiencies may waste precious resources that cannot be easily replaced.³⁵ Professional mastery must therefore be institutionalised if it is to develop further, and key to this is the establishment of an educational institution devoted to this task.

PROFESSIONAL MASTERY - THE WAY AHEAD

The organisation of men and machines into military forces does not necessarily mean that they are equipped and trained for the accomplishment, if necessary, of

³² Interview with Lieutenant Colonel Steven Salmon (Australian Army Armoured Corps), Canadian Forces College, Toronto, Canada of 3 April 2001.

³³ Millar, Squadron Leader David, Aerospace Centre Paper Number 73: Requirement for a RAAF Tactical Doctrine System, Aerospace Centre, RAAF Base Fairbairn, ACT, 2600, 1999.

³⁴ Operation Stabilise saw the first operational use of the RF-111C reconnaissance variant of the F-111 strike aircraft. In addition to hundreds of C-130 Hercules airlift sorties into and out of East Timor, Caribou tactical transport aircraft are currently deployed to East Timor.

³⁵ The RAAF presently has a personnel establishment of 13,555 and operates 266 fixed wing aircraft of 16 types. It should be noted that the RAAF does not operate helicopters but that the Army and Navy operate approximately 170 between them.

decisive action in war. For this, the discipline of a coherent body of thought appears to be indispensable.

Eugene Emme

Two air forces that stand out as being relevant role models for the RAAF with regard to their acceptance of the requirement to establish institutions to educate officers in aerospace oriented Operational Art are the United Kingdom's Royal Air Force (RAF) and the United States Air Force (USAF). Both air forces provide significant training in the operational level of war for its officers which includes air campaign leadership, air campaign planning, air targeting, and air battle management. In particular, the RAF Air Warfare Centre (AWC), the USAF College of Aerospace Doctrine, Research and Education (CADRE) and the Command and Control Warrior School (C2WS) will be briefly discussed.

The mission of the RAF AWC is to 'contribute to the military capability of Strike Command by developing and implementing operational and tactical doctrine and providing essential and timely integrated mission support to Royal Air Force operational units in peace and in war.'³⁶ The AWC was formed in October 1993 as an amalgamation of the Central Tactics and Trials Organisation, Electronic Warfare Operations Support Establishment, Operations Research Branch and the Department of Air Warfare. This was a result of lessons learned during the 1991 Gulf War, with the intention being to form an integrated and coherent organisation that would be able to provide timely and integrated mission support to combat forces, and to develop and disseminate operational and tactical air power doctrine. The AWC can trace its lineage back to

³⁶ Royal Air Force Air Warfare Centre, <http://www.raf.mod.uk/awc/asd/awc/awc.html>, 30 January 2001.

before the Second World War, but it is only since the late 1950s that its predecessors have emphasised air doctrine and operations rather than flying skills.³⁷

The AWC is a very large organisation that is split between several bases, two of which are RAF Stations Waddington and Cranwell. Commandant AWC is an air commodore who reports to the Air Officer in Command of Strike Command.³⁸ The AWC is organised into five functional departments, but the key department for the purposes of this paper is the Operational Division. The Operational Division ‘encompasses operational-level doctrine and development, the provision of operational support to air and joint headquarters and training staffs, [and] the administration and instruction of all air warfare courses.’³⁹ The categories of courses offered by the Operational Division include aerosystems, electronic warfare, weapons employment, targeting, and operational courses such as the two week Air Battle Combat Support Course (ABCSC) and the four week Air Battle Staff Course (ABSC). The ABCSC and ABSC are aimed at training officers in such areas as air campaign planning and air battle management for employment in operational level headquarters. The AWC also provides JFACC training to one star officers attending the UK’s Higher Command and Staff Course (HCSC), a three month course conducted by the Joint Services Staff College (JSSC).⁴⁰

The USAF College of Aerospace Doctrine, Research and Education (CADRE) is the successor to the Air Corps Tactical School of the 1930s and is a unit of the Air University at Maxwell Air Force Base, Alabama. The mission of CADRE is ‘to assist in the wargaming,

³⁷ E-mail from RAF Air Warfare Centre, OC Training Management, Squadron Leader David Freak (OCTrgMgt@od-t.demon.co.uk), 29 March 2001.

³⁸ Ibid.

³⁹ Royal Air Force Air Warfare Centre, <http://www.raf.mod.uk/awc/asd/awc/awc.html>, 30 January 2001.

development and analysis of the concepts, doctrine, and strategy of aerospace power; to educate Air Force and Joint communities on warfighting at the operational and strategic level through research, wargaming and military education courses.’⁴¹ CADRE also publishes the acclaimed *Aerospace Power Journal* and conducts courses in aerospace doctrine and air campaign planning. For example, the Joint Doctrine Air Campaign Course (JDACC) is a two week course designed to teach officers how to serve on the staff of a JFACC. The course includes the fundamental concepts, principles and doctrine required in air campaign planning. The JDACC was created as a direct result of the 1991 Gulf War when it was decided that the existing training of air force officers in air campaign planning was inadequate. The one week JFACC and CFACC courses are conducted for one and two star officers, and are designed to prepare potential JFACCs and CFACCs for theatre level air power leadership responsibilities.⁴²

The USAF Command and Control Warrior School (C2WS) at Hurlbert Field, Florida, conducts JAOC training with an emphasis on current doctrine, tactics, techniques and procedures. The C2WS provides seven courses, using the latest command and control technology, to personnel from the most junior airmen to lieutenant generals. Of special note to the RAAF, the School also conducts TBMCS (which is being introduced into RAAF service in the next several years) and Air Tasking Order (ATO) production training.⁴³ There is considerable synergy between CADRE and C2WS as CADRE’s JFACC and CFACC courses undertake practical training in C2WS’ facilities.

⁴⁰ United Kingdom Joint Services Command and Staff College, <http://www.jscsc.org.uk/>, 5 April 2001.

⁴¹ United States Air Force College of Aerospace Doctrine, Research and Education, <http://www.cadre.maxwell.af.mil/>, 29 January 2001.

⁴² CADRE, <http://www.cadre.maxwell.af.mil/>, 29 January 2001.

⁴³ United States Air Force Command and Control Warrior School, <http://c2tic.hurlbert.af.mil/c2ws/>, 30 January 2001.

The RAAF made considerable headway in the arena of doctrine development and air power education in the early 1990s. This was almost entirely due to the establishment of the Aerospace Centre. Whilst doctrine and debate are important, however, the RAAF must now develop the practical skills required at the operational level of war. To develop the Operational Art in its people and place the systems training in its proper context, the RAAF requires the equivalent of the AWC, CADRE or C2WS. In this way the RAAF will develop its air campaigning capability and provide formal links between doctrine, development, training, education and operational capability. Of the three allied organisations detailed, none could be copied directly into the RAAF environment. What is required is an institution that incorporates the most relevant components of each. It is proposed to name the new RAAF institution the 'Centre for Aerospace Warfare' or CAW.

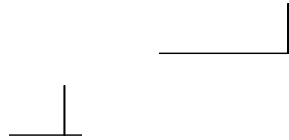
To achieve the RAAF CAW, it is proposed that the Aerospace Centre and the systems training elements of SAN and EWSQN be amalgamated. This will have the immediate benefit of streamlining the RAAF's systems training and focusing the courses better towards operational and tactical requirements. As a matter of the highest priority, it is proposed that the RAAF develop JFACC and JAOC Courses to teach aerospace power planning and aerospace battle management skills. Further, it is recommended that the RAAF develop its own Air Targeting Course to ensure that the RAAF has quality and 'effects based' focused targeting personnel. It is clear, however, that the RAAF will not be able to develop these new courses without first establishing a reasonably wide knowledge base. To achieve this, the Service will have to expend

significant funds on sending selected personnel to US and UK JFACC, air campaigning, battle management, and targeting courses. These personnel would then form a cadre from which RAAF specific courses would be developed and conducted.

Conceptually, the proposed organisation of the RAAF CAW is shown in Figure 1 below. A commandant of group captain rank would command the CAW and he would be supported by an executive officer that would control the institution's support and intelligence branches, as

would be a sound historical basis for future development work that could then be put into doctrine or drive capability development and acquisition.

The Training and Education Wing would have two branches: Operational Training Branch, and Weapons Systems Training Branch. The main focus of the Operational Training Branch would be air campaign planning, air battle management and air targeting. The Branch would be responsible for at least three courses; the Joint Forces Air Component Commander's Course, the Joint Air Operations Centre Course, and the Air Targeting Course. This branch



resources. This training would draw heavily from the aerospace doctrine development being conducted elsewhere within the CAW, and the added availability of weapons and electronic warfare systems instructors transferred from SAN and EWSQN would make for the seamless inclusion of aerospace systems theory and tactics.

The JFACC Course would teach wing commanders, group captains and air commodores, how to command air operations and manage the air campaign planning process. This course would concentrate on the command aspects of aerospace warfare, particularly air strategy development, air doctrine, coalition air warfare, objectives and guidance development, apportionment and allocation, and the relationship between the strategic and operational levels of war.

The JAOC Course would train flight lieutenants, squadron leaders and wing commanders for appointments at operational and tactical level headquarters to conduct air battle planning and management. The course would concentrate on air doctrine, air campaign planning, historical analysis, master air attack plan development, command and control, logistics, apportionment, air tasking order and directive production, levels of force analysis, surveillance and reconnaissance planning, military applications of space, and the use of the TBMCS. Additionally, a course for the logistics, personnel and communications aspects of air campaign planning would be developed as the RAF AWC has done in its Air Battle Combat Support Course (ABCSC).

The Air Targeting Course would train personnel to undertake the art of targeting. This would include such subjects as air targeting theories, the formulation of measures of

performance linked to targeting objectives, target systems analysis, critical element analysis and selection, target list production, targeting related laws of armed conflict, weaponeering, master air attack planning, collateral damage assessment, battle damage assessment and weapons effectiveness assessment. Whilst the current ADFWC Joint Targeting Course (JTC) touches on all of these subjects, the joint focus of the course and its limit to two weeks detracts from the RAAF aim of developing competent targeting officers who can effectively undertake the detailed work of targeting, and not simply be exposed to the joint process.

Throughout the conduct of the Centre's courses, it is important that the future commanders and battle staffs of the RAAF be well briefed on regional aerospace warfare capabilities. The CAW will therefore require a robust Intelligence Branch. It is proposed that these briefings go well beyond the typical aircraft systems and tactics briefings generally conducted at flying units by squadron intelligence officers, and instead concentrate on how air forces actually fight. Briefings would therefore concentrate on the results of regional exercise and operations analysis, key regional air commanders and staff officers, basic, operational and tactical aerospace doctrine, command and control structures, and intelligence capabilities. These briefings would also serve to provide a yardstick by where RAAF officers could compare themselves with regional counterparts and ensure that RAAF professional mastery is maintained.

The conduct of CAW command post exercises will be key to validating the training of JFACCs and JAOC staffs. The USAF Air University conducts several exercises in the Air Force Command Exercise System (ACES) series. ACES PEGASUS for example, is an air campaign war game used by both the Canadian Forces College and UK Joint Services Command and Staff

College during the air force terms of their respective command and staff courses.⁴⁵ A suitable exercise could be acquired or developed to ensure that skills are tested and learning points emphasised for all CAW courses.

The Weapons Systems Training Branch would conduct the weapons systems training presently conducted by SAN and EWSQN. The Weapons Employment, Aircraft Integrated Systems and Electronic Warfare courses for which these institutions are presently responsible would simply be collocated. There would be many benefits from this collocation: economy of resources and instructors, cross-pollination of ideas and lecture packages, and a streamlining of the actual course syllabi.

In terms of operational level training, it should be possible to provide a system of interconnected single Service and joint training, so that courses such as the ADFWC Joint Operations Planning Course (JOPC) and Joint Targeting Course (JTC) are integrated into a RAAF officer's career scheme. A training strategy should be developed which interleaves joint training with single Service training so as to produce personnel who can perform both in joint headquarters, as well as air component ones, and provide high quality input into the joint arena on aerospace matters. For example, a RAAF officer posted to HQAST or the HQAST Air Component would attend the JAOC Course at the RAAF CAW and the JOPC at ADFWC. In this way, the CAW would maximise its orientation towards aerospace matters and in the process not duplicate what the ADFWC already provides. This will save the ADF resources whilst producing a high quality aerospace power focused 'joint' air force officer.

⁴⁵ USAF CADRE web page, <http://www.cadre.maxwell.af.mil/>, 29 January 2001.

Lastly, the CAW would continue the Aerospace Centre's publishing efforts and publish a professional journal to stimulate debate on aerospace issues at all levels of war. Whilst the *Australian Defence Force Journal* is a highly regarded publication, it is not aerospace focused and due to its joint nature, is often diluted in content. Internationally, the USAF publishes the *Aerospace Power Journal* and the RAF its *Air Power Review*, whilst within Australia, the Army's CATDC publishes the *Combined Arms Journal*. Since 1991, however, the Aerospace Centre has focused its publishing efforts on working papers, of which it has published 82 in 10 years, an average of eight per year.⁴⁶ Assuming that this rate of publishing continues, and when added to the number of publishable staff college papers on aerospace matters, not to mention other contributions, there is a sufficient RAAF writing effort in place to justify a quarterly journal. It is therefore proposed that the CAW sponsors and publishes a RAAF Aerospace Warfare Journal to further stimulate the Australian aerospace power debate and doctrine development.

CONCLUSION

In no other profession are the penalties for employing untrained personnel so appalling or so irrevocable as in the military.

General Douglas MacArthur

The RAAF has a creditable history and is an experienced combat force. Despite the advances made by the Australian Defence Force at the operational level of war, such as appointing Commander Australian Theatre, raising Headquarters Australian Theatre with an air

component, and adopting the joint task force concept, there are still critical weaknesses in the RAAF's current war fighting capability. One such weakness is the lack of an institution to instil aerospace oriented Operational Art in RAAF personnel. Key to the RAAF's professionalism as a war fighting Service is the concept of professional mastery: the discipline of striving to achieve the best use of air power in Australia's interests by ensuring a comprehensive understanding of a profession's body of knowledge through formal and informal education, training, private study and experience. Additionally, it is clear that the RAAF must develop professional mastery of its own environment before developing professional mastery in a joint one. Unfortunately, this truism has not been recognised, as the RAAF has no institution devoted to this task.

The RAAF relies on the Aerospace Centre to develop basic aerospace power doctrine, and the Australian Defence Force Warfare Centre and Command and Staff Colleges to teach the operational level of war to its officers. Aerospace systems courses are conducted, but they are not pitched at the operational level. The RAAF has therefore failed in its responsibility to instil aerospace operational level professional mastery in its officers prior to their exposure to joint doctrine and training. This paper has shown that in order to develop the level of professionalism required of modern war fighting at the operational level of war, the RAAF must create an institution devoted to such doctrine, training and education. This organisation would be called the RAAF Centre for Aerospace Warfare and be Australia's equivalent to such esteemed allied institutions as the RAF Air Warfare Centre, the USAF College of Aerospace Doctrine, Research and Education and the Command and Control Warfare School.

⁴⁶ According to its web site since 1991, the Aerospace Centre has also published 20 CAF and Fellowship papers, 19

The RAAF needs a Centre for Aerospace Warfare to focus on how the RAAF will fly and fight at the operational level of war. By amalgamating the present Aerospace Centre and the disparate aircraft integrated systems, electronic warfare and weapons employment courses, and developing JFACC, JAOC and Air Targeting Courses, the RAAF will be set to achieve a degree of operational level skill that it has never before attained. It is only through the combination of all the skills to be resident in the proposed Centre for Aerospace Warfare that the RAAF will maximise the quality of its air planners and ensure the Service's continued professional mastery. Without the Centre for Aerospace Warfare, the Service will not achieve the success it should, and must be capable of achieving, if it is to fight and win in any modern conflict. The RAAF is not too small to have a Centre for Aerospace Warfare; it is too small not to have one!

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