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**REQUIREMENTS FOR A RAAF TACTICAL DOCTRINE
SYSTEM**

By

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INTRODUCTION

There is considerable focus within the Australian Defence Force (ADF) on the development of operational doctrine and a suitable organisational structure to support operations. This focus begins by acknowledging a history of tactical excellence displayed by Australian sailors, soldiers and airmen. A salient feature is that Australia has never operated alone at the operational and strategic levels of war. Rather, Australia has served under British and later US strategic and operational command. The less obvious but important corollary is that by operating with British and US forces, using predominantly British and US weapons, the tactical doctrine of the ADF has in many areas been inherited rather than developed. This is particularly the case for contemporary RAAF flying operations.

RAAF flying operations combine advanced flying skills with the employment of airborne and air launched weapons and sensors. These advanced flying skills span such diverse specialisations as air-to-air refuelling, tactical formation flying, electronic warfare, and weapons delivery. An essential adjunct is the science of mission planning, targeting, and weapon matching. Air Forces of recognised excellence such as the RAF and the USAF have established post-graduate organisations that teach advanced air combat, and develop tactical doctrine for air warfare. Tactical leadership is developed in both cases at squadron level through respective weapons and fighter weapons instructors. Dedicated post-graduate training is provided at operational conversion units and schools. The entire process of tactical leadership, training, development and doctrine has command sponsorship. Some of the functions of tactical doctrine development exist within components of the RAAF Force Element Groups (FEGs), but the only dedicated program and unit is the Fighter Combat Instructor program within No 2 Operational Conversion Unit (2OCU). Of greater importance, there is no comparable command organisation in the RAAF. Tactical doctrine within the RAAF is sponsored within each Force Element Group and there is no command visibility or coordination of the process.¹

In contrast, the Royal Australian Navy has a coordinated service-wide sponsorship and coordination of tactical doctrine. This is outlined in DI (N) 46-3, 'Tactics - Evolution and Promulgation', which states in its introduction, 'RAN tactical doctrine is drawn from allied sources supplemented and amended where necessary by unique tactics designed for RAN use'.² This process recognises that most of our maritime tactics involve the employment of assets from more than one Service and that threats to Australian forces might be based on enemy capabilities quite different from those faced by our major allies.

¹ The warfighting components of the ADF are divided into Force Element Groups comprising a common platform or platforms. eg. the Tactical Fighter Group comprises the three operational F/A-18 squadrons, the training units and the Macchi 326H, and an operational wing and group headquarters. Within the RAN the six Guided Missile Frigates (FFGs) form a Force Element Group.

² Defence Instruction (Navy) 46-3 dated 17 June 1996.

To date the RAAF has survived without a service-wide tactical doctrine organisation. There are now a number of factors which necessitate change to the management of tactical doctrine and a reduction in reliance on imported doctrine, as follows:

- a. Australia is now the sole operator of a number of weapon/platform combinations, most notably the F-111, and current foreign sourced doctrine is either non-existent or no longer available.
- b. Along with an increasing dependence on software is a growing reluctance on the part of the US to release source code, while much of the tactical doctrine of weapons and particularly Electronic Warfare systems is classified 'NOFORN' or 'not for foreign release'.
- c. The complexity of the platform/weapon systems is increasing to the level that weapon specific, specialist expertise is required for system operation and employment doctrine.
- d. As DI(N) OPS 46-3 states, increasingly tactics involve combined operations, and coordination and visibility are required above Force Element Group level.
- e. As tactical doctrine also influences the development of operational doctrine, visibility across the Force Element Groups is essential to the development of air campaigns.

One factor which may have lessened the focus of management on tactical doctrine is that the RAAF has not been involved in war or war-like operations for over 25 years. Aid to the Civil Community, such as Search and Rescue, various air transport evacuations and fisheries patrols, has only exercised two of the five Force Element Groups in operations that test tactical doctrine, outside of exercise activity against allies. The RAN, which has a mature tactical doctrine organisation, coincidentally was the only ADF service represented in any major capacity in the Gulf War.

The RAAF is not well placed to exploit the knowledge edge associated with the new generation of weapons that form part of the revolution in military affairs without a structural change within Air Command. Change is required in four areas: command sponsorship, organisation, documentation and training. Discussion will be grouped under these four headings.

The objectives of this paper will be to:

- a. review air-weapon tactical doctrine management within the RAAF, and to establish the need for a change to a more rigorous process;
- b. describe those organisations within the RAF, USAF and RAN which manage tactical doctrine;
- c. propose a tactical doctrine organisation;
- d. highlight the documentation involved and documentation management required;

- e. describe the proposed training regime; and
- f. identify the scope and source of the constrained establishment and workforce.³

RAAF AIR TRAINING AND TACTICAL DEVELOPMENT

RAAF air training, documentation and command visibility are well established up to the awarding of ‘wings’ and conversion onto specific aircraft types. This is largely due to the active sponsorship provided by Training Command and its subordinate air-training wing. However, once aircrew proceed to advanced air training involving the tactics associated with respective weapon systems and tactical employment, training and doctrine is managed within individual Force Element Groups, and in some cases within individual squadrons. With the exception of some activities that require coordinating due to their obvious joint nature, there is little service-wide management of tactical doctrine development.⁴ This is in contrast to the RAF, the USAF and, within the ADF, and in the Australian context, the RAN. There is an argument that economies of scale in a force the size of the RAAF do not allow such organisations. The uncomfortable reality is that as with logistics management, and in particular software management, the increasing complexity of weapon systems no longer allows informal or discrete non-systematic management. This is further compounded by the necessity to interface with other services and forces for joint operations. It is interesting to note that despite downsizing, the RAF, which has been reduced to three Jaguar squadrons and three Tornado F3 squadrons, still retains dedicated training and tactics units.

The acceleration in weapons ‘knowledge edge’ is a relatively recent event, with the focus of development changing from airframes and engines to avionics and weapon systems.⁵ For the first 60 odd years, the RAAF employed weapons falling into the broad categories of gunnery, free-fall ballistic weapons, rocketry, and torpedoes. The introduction of the Sabre and later the Mirage saw the introduction of short-range, rear-hemisphere, air-to-air missiles such as the AIM-9B and the Matra. In both cases the weapons were employed within a single Force Element Group, and employment did not require complication such as third party targeting. Both were effectively line-of-sight, rear-hemisphere weapons, and therefore utilised extensions of extant gunnery tactics.

Since 1985, however, the RAAF has introduced four major air launched weapons, all involving a major increase in complexity. These are the AIM-7M (semi-active radar missile), the AIM-9M (off-boresite Infra-Red missile), the Paveway II series GBU-10 & 12 (laser guided bombs), and the AGM-84 Harpoon (anti-shiping missile). With

³ In commercial terms, Constrained Establishment (CE) identifies the positions or ‘vacancies’. Workforce identifies the actual personnel available to fill the positions.

⁴ An example is the Maritime Warfare Operations Committee or JMWOC which is jointly managed by the Chief Staff Officer of Maritime Headquarters and Directing Officer of Air Headquarters.

⁵ In the 15 years from 1951-1966, the RAAF saw no less than four front line fighters from the Mustang and Meteor, to the Sabre and Mirage. In the similar period 1991-2006, only one fighter and one strike aircraft are to be in service. The fundamental difference is due to the increasing cost of platform and operating costs, and the inherent ability to modify software driven avionics. Both of the latter platforms will have undergone a number of major avionics and weapons fit updates by 2006.

the exception of fitting the AGM-84 to the F-111 these were extant weapon/platform systems within the USAF or USN. Thus, RAAF Developmental Test and Evaluation for these systems was done either in toto by, or with considerable assistance from the US Weapons Test Center at Eglin AFB or the Naval Weapons Research Center at NAS China Lake. The majority of the development of flight envelope and employment has largely been externally sourced from the USAF or USN data. This is not to belittle the work of Aircraft Research and Development Unit (ARDU), but in the current climate of unique or domestically modified weapons systems, a considerable component of testing and system management is no longer available.

This reliance on borrowed development extends to most facets downstream in the processes associated with the introduction of new capability. Following Developmental Test and Evaluation (DT&E) is Operational Test and Evaluation, which is that component of weapons testing done by 'line' aircrew, and is the precursor to tactics development. The USAF has an entire unit dedicated to Operational Test and Evaluation at Albuquerque, New Mexico. Operational Test and Evaluation was not formally carried out by the RAAF prior to the F-111G Aircraft Acquisition Program,⁶ and tactics were largely borrowed en masse with the assistance and expertise of US and Australian exchange aircrew, both in Australia and the US. In addition, specific training for new systems was purchased from the manufacturer for selected aircrew, who were then responsible for introducing training and tactics to the squadrons. This placed enormous value on individuals who then became critical investments for the RAAF. In periods of posting turbulence and high resignation rates, the RAAF suffered 'corporate memory loss' as a result of this practice.⁷ Simply put, the RAAF does not have the infrastructure to manage the next generation of 'smart' and stand-off weapons.

Dependence on Exchange

One factor that has masked the need for indigenous dedicated tactical training and doctrine development has been the extent of the expertise supplied by the exchange programs with the RAF and USAF since the mid-1980s. The influence of the exchange program has been well recognised in generic terms, but the level to which it has masked the need for indigenous tactical training may not have been recognised at command and policy development level. By way of example, 20 per cent of strike crews in No 1 Squadron during the period 1985-1991 were exchange officers, who furthermore represented around half of the senior, or supervisory, and training aircrew. This contributed a significant but hidden input into tactics development. At the same time and from the same squadron, four Australian aircrew were on exchange with the USAF and RAF gaining similar experience overseas. Of the three USAF exchange Weapons Systems Officers in the period 1988-1994, all were Fighter Weapons Instructor qualified, and two had recent F-111 combat experience, one from the Eldorado Canyon Libyan raid and the other as a result of operations in the Gulf

⁶ The author, as F-111G Project Aircrew Liaison Officer, along with SQNLDR W. Lawrence, approached ARDU to obtain the methodology for the conduct of OT&E, to provide assurances to the Air Worthiness Board as to the safety and efficacy of some USAF F-111 tactics, not conducted in RAAF F-111 operations. CO Flight Test Squadron advised us that at the time (mid-1993) there were no RAAF procedures for conducting OT&E within the RAAF.

⁷ The training of the F-111G aircrew was a case in point. In the period between training and delivery completion, two of the four trained aircrew were no longer available. A similar situation occurred in 1985 following the delivery of the first F/A-18 Hornets from the US to Australia.

War. As Australia is now the sole operator of the F-111, this direct exchange experience has ceased.

With the introduction of the F/A-18, the RAAF had its first opportunity to develop tactics for and against Beyond-Visual-Range (BVR) missiles and a 'Look-Down, Shoot-Down' fighter. During 1985-1990, much of RAAF fighter and strike tactical development for this capability came through the exchange program. This is hardly surprising as the flow of tactical knowledge is in fact one of the objectives of the exchange program. Aircrew exchanges are aimed at experienced junior aircrew, of Flight Lieutenant rank with around 500 hours on fast jet aircraft. During the same period, foreign exchange officers by virtue of the fixed tenure of their exchange often provided the continuity of experience within some RAAF squadrons due to the high resignation rate of their Australian peers. Exchange positions generally have tenure of two years on completion of conversion or refresher course. At the time this often exceeded Australian pilot tour lengths due to resignation rates of this cohort, and the need for short tours due to the requirement to man ab initio flying training schools.

Loss rates reached a pinnacle in 1986 through 1988 where large-scale recruitment by the airlines saw a serious loss of experience from the RAAF. Pilot separation rates were 119 (14.8 per cent) for 1987 and 102 (13.9 per cent) for 1988.⁸ This represents just under one-third of all active pilots in the RAAF, but was drawn almost entirely from the experienced junior officer group. Unfortunately this is the very group who largely 'own' the professional mastery of RAAF flying operations. The ability of exchange officers to bolster this cohort has lessened over the past five years due to the same reasons cited in the introduction; namely, the increasing use of unique systems and lack of foreign release of data. In the case of future aircrew exchanges at 82 Wing, the exchange officers will be from dissimilar aircraft types. And for 92 Wing, following the RAAF P-3 upgrade, the AP-3C will be a distinct variant from the USN P-3.

Failures Attributable to Tactical Documentation

Any shortfall associated with investing in individuals without a similar investment in process and documentation should come as no surprise.⁹ What has been well known to engineers, has for a variety of reasons not yet become common practice for aircrew. The fundamental principle of the ISO 9000 style quality management, whereby all process is documented, was largely rejected by the war-fighting elements of the Air Force. The lack of a system designed to capture tactical doctrine has exposed knowledge gaps in the recent past. The 1990 live firing of an AGM-84 Harpoon by a P-3 crew resulted in a miss that was due to a fundamental misunderstanding of weapon/system interface knowledge by the crew, and in fact the entire wing.¹⁰ The

⁸ Data provided by DWPC-AF - FLTLT Whelan, June 1995.

⁹ In fact, a look through history would indicate that all the great cultural and technology revolutions were associated with a change or breakthrough in the use of the written or recorded media. There is no reason why the Revolution in Military Affairs should be any different. The first use of written characters provided (in the current lexicon) a 'knowledge edge'. The printing press heralded the end of the dark ages, and in recent times, configuration management practices and audit trails have differentiated good software development from bad.

¹⁰ 'Live Firing of AGM-84 missile RIMPAC' in *Summary of Weapon Practices FY90* Volume 5, RAU Technical Notes WAU 1/90.

obvious limitation is that due to cost, live firings of Harpoon missiles are a biannual event on a rotation between the three air platforms. Therefore it is highly unlikely that there is continuity in personnel between firings, but it is the lack of a capture mechanism for tactical doctrine and lessons learnt that is highlighted in this case. Concern over lack of system knowledge led to the postponement of a 1996 planned live firing of an AIM-9M from an F-111C. A similar lack of documented tactical doctrine and formal post-graduate weapons training also occurred with the introduction of high angle bombing for the F-111G following a posting cycle.¹¹

The future will see the acquisition of more complex weapons such as the AGM-142, Anti-Radiation Missiles (ARM), future extreme range Beyond-Visual-Range (BVR) missiles, and stand-off systems such as the Joint Direct Attack Munition (JDAM) and Joint Stand-Off Weapon (JSOW). In the author's opinion, the development of tactics for these weapons will be well beyond the ability of a single wing weapons officer and selected (and transitory) aircrew from within an operational squadron. At the time of writing, the need for additional effort associated with the introduction of new systems appears to be finally recognised. Air Lift Group is in the initial process of attempting to establish an Operational Test and Evaluation Cell to assist in the introduction of the C-130J Hercules.

Documentation

The issue of coordinated and standardised documentation is at the heart of the need for reform of tactical doctrine management. The current process is in contrast to the management of non-tactical RAAF flying operations where the characteristics of every aircraft type in the RAAF are laid out in the relevant flight manual and associated publications. RAAF flight manuals are generally of high quality, in a mature form, standardised throughout the RAAF, and are regularly amended and checked for compliance. When this was not the case, as highlighted during the B-707 accident inquiry, poor documentation contributed to disaster.¹² Part of a flight manual includes stores (weapons) carriage and release (Section Five), and they have subordinate weapons employment and ballistics manuals (the 'Dash 34' series), but these do not include tactics.

Tactical doctrine manuals are currently of diverse source and with little standardisation or commonality between the various publications. The 1996-97 Defence Instruction Review Program (DIRP) standardised orders and instructions, and whilst instigating a review of tactical doctrine for compliance in titling and hierarchy, did not address the fundamental management of tactical doctrine. Strike Reconnaissance Tactical Instructions are in the process of becoming a two-volume document titled Strike Reconnaissance Tactical Procedures (SRTPs), and Tactical Fighter Group's Standard Operating Procedures have become Tactical Fighter Tactical Procedures (TAC PROCS). However, both documents lack commonality and a coherent relationship to a command-sponsored document such as Air Staff Instructions. Another issue was when tactical doctrine was foreign-sourced, such as the COMBEXAG V for maritime operations, the Defence Instruction Review Program was unable to influence either nomenclature or structure of the document.

¹¹ Both of these events occurred during the author's tenure as Executive Officer of 6 Squadron.

¹² DFS-AF Accident Review Boeing 707 Accident 29 October 1991.

Apart from the issue of standardisation, development of doctrine publications has at times been spasmodic within some Force Element Groups due to the lack of dedicated doctrine developers. For the Strike Reconnaissance Group, difficulties associated with documentation have been compounded by the inability to access USAF F-111 doctrine following the retirement of the USAF fleet. Strike Reconnaissance Tactical Instructions were revived in 1991 by the then Officer Commanding,¹³ but have constantly lagged current practice since. On three occasions since, reserve officers have been used to supervise a collective effort to bring this document into line with current doctrine, imposing a considerable load on squadron aircrew on each occasion. The failure to achieve a 'living/breathing' status of the prime source of F-111 tactical doctrine is attributed by the author to a lack of ownership of the document, in contrast with the FCI 'ownership' of F/A-18 Tactical Procedures.

A major area that will need increased attention is the operator input into software management. The introduction of the C-130J will bring Air Lift Group into line with the other Force Element Groups, in the need to provide coherent and definitive operator advice to the engineering management of software such as operational flight programs (OFPs). Maritime Patrol Group has had the greatest experience with this issue with the management of the sensor suites in the P-3C by 292 Squadron. However, the author's experience in attempting to coordinate mission planning requirements both within and across Force Element Groups would indicate that this aspect of the changes in military technology are far from well understood. The ability to change a planning program or even the way in which information is displayed and processed in the cockpit is one that requires rigorous investigation, oversight and documentation.¹⁴ Where a single character change on a display can cost \$10,000 and many hours of regression testing, change management is an area requiring further education and supervision, for no other reason than budgetary restraint.

Training

Tactical training suffers from the same problem as tactical doctrine. There is no service-wide organisation responsible and accountable for coordination and standardisation of tactical training. Whilst ab initio and conversion air training through the Qualified Flying Instructor stream is a formal and well understood process accountable to Central Flying School, the same cannot be said of weapons qualifications and tactical training. The Tactical Fighter Group is the exception with its Fighter Combat Instructor program. In this practice, the RAAF is at marked odds with both the RAF and the USAF, with their respective Qualified Weapons Instructors and Fighter Weapons Instructors. The Weapons Employment Course run by the School of Air Navigation might be surmised to fulfil this function, but the title is in fact a misnomer. The Weapons Employment Course is an academic targeting, weapons effect and weaponeering course. There are significant advantages in having a

¹³ (Then) Group Captain Peter Criss re-issued SRTIs in 1991, after nearly a decade of being out of circulation.

¹⁴ A review of Software Change Proposals (SCPs) for the F-111 Mission Planning Preparation Equipment (MPPE) and the F/A-18 Mission Planning System (MPS), exhibit numerous examples of cyclic proposal, counter-proposal and unnecessary or even nugatory change, because of a lack of appropriate review and consultation. There has also been evidence of duplication of contractual change due to the lack of consultation between Force Element Groups operating similar systems from the same contractor.

codified post-graduate flying course. Formal training provides a known standard and tactics development can be progressive rather than cyclic, as has been the case in the past where lessons have had to be relearned, even though the knowledge existed previously; a point also highlighted in the B-707 accident inquiry.¹⁵

The need for formal training to parallel Fighter Combat Instructor training has been recognised by some within Strike Reconnaissance Group with several attempts over the past ten years for crews to participate in components of a Fighter Combat Instructor course.¹⁶ A combination of exercise tempo, workload and aircraft availability has prevented participation. Conjoint training, a necessary precursor to conjoint tactics development, has depended on individual relationships between fighter and strike commanders. This should be a directed activity through a formal program. Considerable gains were made in the late 1980s, but progress has been fitful to the present day without a formal program.

To ignore the need for post-graduate tactical schooling is to ignore significant lessons from history. The most highly publicised post-graduate school in the United States Navy is the 'Top Gun' school which was formed to counteract a declining kill ratio in the South-East Asian war. This was where actual combat highlighted deficiencies in combat air training and led to the formation of the Naval Fighter Weapons School at Miramar Naval Air Station. The lesson was not new, however, as the Royal Air Force had the same initiation in World War II. At the start of the war, pilots arrived at squadrons with little or no tactical training. On first contact with hostilities there were high loss rates of junior aircrew, who never had the opportunity to learn tactical competence before being committed to combat. By the end of the war, pilots had not only graduated from an Operational Conversion Unit, but also were coached by the graduates of the Central Gunnery School.

Apart from professional mastery with its obvious outcome of higher success and aircrew survival rates, there are cultural and motivational advantages to formal post-graduate tactical training. One senior maritime Tactical Coordination Officer (TACCO) gave the opinion that there was little enthusiasm to attain higher than 'C' category amongst non-pilot aircrew within MPG.¹⁷ 'C' category is the minimum standard required to be considered 'operational', and there was no incentive or recognition to attain higher. This is in stark contrast to the Fighter Combat Instructor (FCI) qualification, which is seen as a significant achievement with special status accorded to FCI badge wearers. The same applies to RAF Qualified Weapons Instructors and USAF Fighter Weapons Instructors. These qualifications provide further goals to aspire to for aircrew. Apart from a more highly trained cadre, there is improved esprit de corps and morale, which could result in improved retention. In the light of Maslow's hierarchy this should come as no surprise, and in the current quest for both professional mastery, as well as improving morale and identification of non-salary remuneration, this could be a significant factor.

¹⁵ The handling characteristics of the B-707 in the accident configuration were apparently well-known by QANTAS training staff, but not apparently within 33 Squadron, a point made by former QANTAS staff in the media at the time.

¹⁶ 1991, 1995, 1997-1998, in all three cases the author was involved in the related staffwork within 82 Wing.

¹⁷ Wade, SQNLDR P., *Reynolds Essay 1998*, No 51 RAAF Command and Staff Course.

Post-graduate training also provides a cadre of aircrew with a known and quantified expertise in keeping with the intent of the introduction of the OA1 aircrew record,¹⁸ thus assisting in aircrew career management and selection for supervisory promotion and command. Another outcome of a formal course instead of using categorisation scheme 'mile-posts' for tactical training could be the application of a Return of Service Obligation, or ROSO, to the training.¹⁹ Whilst unlikely to be popular, this would increase the personnel management certainty currently sought by the payment of retention bonuses, but without the same divisive effects. Alternatively, a cash bonus could be paid on successful completion of the course and a suitable ROSO. This would also ensure that the retention benefit actually targeted superior performers.

ALLIED TACTICAL DOCTRINE ORGANISATIONS

There are three organisations that provide useful models for various components of the proposed system. These are the RAF QWI system; the USAF FWIC system for tactical training, doctrine development and documentation; and the RAN Surface Warfare Tactics Development Cell at HMAS Watson for command visibility, sponsorship and document control.

The Royal Air Force

The RAF has a formal structure for tactical doctrine development. Each fast jet squadron (Tornado GR4, F3, Jaguar and Harrier) has an establishment of two Qualified Weapons Instructors, who are graduates of an advanced flying and theoretical course run by the respective Operational Conversion Unit (OCU). Each OCU is also responsible for conversion onto the aircraft type (in this manner analogous to the RAAF's No 2 OCU). The course (using the Jaguar as an example) is six weeks long, involves 60 flying hours, and is run once per year with a quota of four students. The graduates (titled Qualified Weapons Instructors or QWIs) form a discrete stream from the Qualified Flying Instructors (QFIs), which again is the case with the RAAF Fighter Combat Instructors of the Tactical Fighter Group. A section of the applied phase of the course is Combined Air Operations (COMAO) conducted under the auspices of NATO. Qualified Weapons Instructors are responsible to the Squadron CO for weapons and tactics training, and are a conduit through the respective OCU for the development of tactics.

Tactics development can be initiated at any level and reviewed by the Qualified Weapons Instructors before being further reviewed by the respective OCU. New tactics or changes, after review by the OCU, are passed on to the Central Tactics and Trials Organisation (CTTO). The CTTO then writes and publishes the Tactics Manual for each aircraft type. The CTTO has recently been replaced by the Strike Attack Operational Evaluation Unit (SAOEU) for the ground attack platforms (Tornado GR1, Jaguar and Harrier), and the F3OEU for Tornado F3 fighter interceptor operations. Within each OCU is an Operational Standardisation and Evaluation Unit (OEU).²⁰

¹⁸ The OA1 is the record of aircrew training and competency with annotation by flying supervisors as to suitability for specialist training such as flying instruction, test pilot course or command.

¹⁹ A Return of Service Obligation (ROSO) is a period of prescribed service placed upon an individual following training or posting that is designed to allow the service to gain a 'return on investment'.

²⁰ Information supplied by SQNLDR N. Connell (RAF Jaguar QWI and exchange student No 51 CSC).

The United States Air Force

The USAF Air Combat Command (ACC) has a central tactics school at Nellis AFB. This is the central school and sponsor of tactical doctrine within ACC which commands all tactical air assets including fighter, strike, ground attack, 'strategic' bombers (B-1, B-2, F-117, and B-52) and the tactical transport fleet. Each platform has a subsidiary Fighter Weapons Instructor Course (FWIC) school within the respective wings, much like the QWI element of the RAF Operational Conversion Units. FWIC graduates provide a cadre of 'badged' Fighter Weapons Instructors who are analogous to the RAF Qualified Weapons Instructors, and the RAAF Fighter Combat Instructors. Within each wing the FWIC also provides specialist advice to the wing headquarters on tactical doctrine and weaponeering. The FWIC also maintains a tactical library for each type, and manages the type-specific volumes of the ACC sponsored Combat Aircraft Fundamentals ACCM 3. In the case of the now retired USAF F-111 fleet, the volume was the ACCM 3-3 Vol VI. Each aircraft type volume contains the tactical doctrine for the employment of that platform. The parent document contains command instructions and conjoint doctrine.²¹

Royal Australian Navy

The RAN provides a useful model for the command involvement of the proposed organisation, exhibiting sponsorship and coordination of tactical doctrine and publications. All RAN tactics are approved by the Maritime Commander Australia (MCAUST) following advice from the Maritime Warfare Operations Committee (MWOC). The MWOC has representatives from surface forces, submarines, mine warfare, maritime air warfare, the Tactics Development Cell and the ADF Warfare Centre. It is a representative and coordinating body covering all aspects of maritime warfare tactics. The Tactics Development cell has representatives from all the surface Force Element Groups for the development of surface warfare. Documentation of tactical doctrine is contained in the Allied Maritime Tactical Procedures (AMTP) series. Tactical training is conducted through a graduated series of formal courses leading up to the coveted Principal Warfare Officers (PWO) course. Whilst not all aspects of maritime warfare translate to air warfare, the RAN model has significant relevance to the RAAF. The concept of command visibility and responsibility through a cascade of specialist tactics development and doctrinal organisations, linked to the other services through the ADF Warfare Centre, is one that the RAAF should consider for conjoint, combined and coalition operations. The introduction to DI (N) OPS 46-3 would be an appropriate introduction to a RAAF DI (AF) covering tactical doctrine, with 'RAAF' vide 'RAN' and 'air tactics' vide 'maritime tactics'.²²

PROPOSED TACTICAL DOCTRINE SYSTEM

This paper argues that the present structure of the RAAF, in particular Air Command, is not suited to exploit the knowledge edge associated with the next generation of

²¹ The information on USAF doctrine management was supplied by LTCOL G. Mullen (formerly USAF 27th FW HQ OPSO), FLTLT T. Schneider (formerly CAPT USAF 27th FW Stan Eval), and MAJ T. Carlson (formerly USAF 27th FW FWIC Instructor).

²² LCDR P. Cook RAN TD Cell, RANSWARS, HMAS Watson.

‘smart’ and stand-off weapons associated with the revolution in military affairs. It further argues that a tactical doctrine organisation is required within the RAAF. Changes are proposed for the level of sponsorship, and change to organisation, documentation (publications) and training. The proposal is for an organisation based on the tactical development organisations within the Royal Australian Navy, Royal Air Force and United States Air Force. The proposed organisation is three tiered with representation in command, wing and squadron. Whilst it can be argued that the functions of the lower components already exist in some form within current RAAF flying units,²³ these organisations suffer from a lack of service-wide coordination. There is also a strong perception by the author (shared by many of his peers) that the current structures often lack continuity in documentation and personnel (in anthropological terms, exhibiting oral rather than written tradition). Consequently, squadrons have exhibited ‘corporate memory loss’ during periods of posting turbulence and high resignation rates.²⁴ Discussion of the proposal is dealt with in four parts: sponsorship; organisation required; documentation involved; and training required. Sources of additional personnel are dealt with separately under establishment and workforce.

Sponsorship

Air Command visibility and sponsorship of tactics is the least developed facet of tactical doctrine management, and one that this proposal seeks to rectify. Currently the only formal annual review of flying operations occurs during submission to the annual Air Worthiness Board. Rigorous independent review of tactical development outside of a Force Element Group occurs under extraordinary circumstances such as following an accident or serious incident when the Directorate of Flying Safety may recommend changes to procedures.²⁵ The preferred model for command sponsorship of tactical doctrine is one similar to the current process within the RAN. Maritime Commander Australia approves all RAN tactics following advice from the Maritime Warfare Operations Committee, which is chaired by the Chief Staff Officer (Operations) of Maritime Headquarters, with representations from all schools and centres such as the Mine Warfare Centre and fleet representatives. Proposals are forwarded to Maritime Headquarters and if selected forwarded to the Tactics Development Cell in a manner similar to the RAF Central Trials and Tactics Organisation.

Organisation

The proposed command organisation should exist within Headquarters Air Command as a committee, under the chairmanship of Chief of Operations Air Command. Representation should include role specialists from within Air Command, Force Element Group Wing staff, ARDU (in particular Electronic Warfare Squadron), the

²³ Tactical Flight 36 Squadron for tactical transport operations, Weapons Flight 1 Squadron for Strike Operations, elements of 292 Squadron and 92 Wing for Maritime Operations and No 2 Operational Conversion Unit for Tactical Fighter Operations.

²⁴ There is considerable anecdotal evidence, with numerous examples of ‘Re-inventions of the wheel’ across the Service, the 1995 ‘debate’ over formation avoidance rules being a case in point.

²⁵ Recommendations from the Accident Investigation Team following the crash of F-111 A8-128 led to mandating the wearing of ‘G’-suits, a previously voluntary practice, and changes to post-tactic Terrain Following step down procedures.

ADF Warfare Centre, and representatives from the RAN and Army.²⁶ There is no intention to expropriate the activities of the flying wings and Force Element Groups, but such a committee would allow a formal process for tactical doctrine development in areas such as maritime strike, maritime air control, close air support and battlefield interdiction. These are areas where there are multiple source documents in use, and tactics are joint or combined. A forum at command level would allow resolution of issues of inter-Group contention, and could provide synergistic improvements in professional mastery.

The proposed changes within Headquarters Air Command parallel the RAN process. A necessary adjunct would be the establishment of a command cell (again similar to the RAN Tactics Development Cell) to manage the command documentation and set up the necessary 'relational data base' for cross-referencing doctrine sources. The necessary (as yet non-existent) publication to manage this activity would provide a bibliographic hierarchy of tactical doctrine as it applies to each platform. To illustrate the point, to currently conduct a maritime strike package requires reference to material in the USN sponsored COMPEXAG V, Strike Reconnaissance Tactical Procedures (SRTPs), RAN sponsored Australian Maritime Tactical Instructions (AMTIs), and possible reference to Air Staff Instructions (ASIs), other Force Element Group Instructions, all without an overarching document or index. The intention would be to provide a parent Air Command document or index to at least provide precedence and amendment status for the tactical doctrine publications in use. This would require a small establishment increase, but should Air Headquarters collocate with the other environmental headquarters and the Warfare Centre, this 'relational database' issue could become part of the publication responsibility of the Warfare Centre. A point to note is that this proposal is only applying engineering rigour to documentation such as is found in the NATO STANAG and 'Tulip' process or Quality standards akin to ISO 9001.²⁷

The proposed organisation change at squadron and wing level should mirror the Fighter Combat Instructor organisation in the RAAF Tactical Fighter Group, which is similar in function to both the RAF and USAF systems. Whilst scale unfortunately precludes an Operational Conversion Unit for each Group discipline, an expansion or modification of the existing training, weapons or tactical flights is not precluded. Although establishment is dealt with separately, there is provision within the Defence Efficiency Review for modest increases in aircrew populations within the various Groups.²⁸

Little if any change is foreseen as required for Tactical Fighter Group, but a change in role of one of the flights within the other three flying Force Element Groups is seen as essential. Which flight is the most appropriate to take on the new role is properly a

²⁶ This forum could be used to coordinate and standardise RAAF input into documents such as the Australian Maritime Tactical Publications (AMPTs), where currently RAN Tactics Development cell has to coordinate individually with Tactical Fighter, Strike Reconnaissance and Maritime Patrol Groups. It is envisaged to absorb much of the functionality of bodies such as the Joint Maritime Warfare Operations Committee (JMWOC).

²⁷ The ISO 9000 series (International Standards Organisation) are those relating to the internationally recognised Quality Management process, and compliance with ISO 9001 is required for Federal Government contracts.

²⁸ One of the purposes of the Defence Efficiency Review was to move assets from the 'tail to the teeth' of Defence. One of the proposals was to increase crew numbers in the combat Force Element Groups.

matter for the respective wings to determine, but the proposed role of the new 'Tactics Development' or 'Weapons Instructor' Flights should include the following:

- a. act as a core of experience and 'corporate memory';
- b. act as a development cell for weapons employment and tactical doctrine including Operational Test and Evaluation (in conjunction with ARDU), validation, and cadre training;
- c. conduct exercise analysis (lessons learnt) and amend tactics accordingly;
- d. be specialist advisers to wing and group commanders on weapons issues;
- e. provide a standardisation and evaluation capability;
- f. liaise with other units and bodies such as SAN Weapons Flight, Weapon Software Support Facilities, ARDU, DSTO and DGFD(Aerospace);
- g. manage the -34 series weapons manuals, the CWDS, JMEMS and JMEMS/AS weaponeering system; and
- h. provide 'FCI/Qualified Weapons Instructors' to conduct weapons training within squadrons.

As acknowledged previously, many of these functions are already performed within the existing structures of the current Force Element Groups, albeit on an ad hoc basis. However, the collocation into such 'centres of excellence' provides a single point of contact for tactical doctrine coordination. Such a concentration of professional mastery should improve the organisation's rather than the individual's ability to retain corporate memory, particularly in periods of high pilot separation. This argument for preserving core skills has been previously applied to the continuing need for Central Flying School to preserve flying instructor standards. Given the change in access to weapons training and foreign tactical doctrine as outlined previously, there is now a need to carefully husband expertise in tactical doctrine, especially in disciplines involving complex weapons deployment using unique or limited access platforms such as the F-111, AP-3C and F/A-18A/B.

What is not evident in any of the current organisations is the previously identified need to provide operational requirements for software managers in organisations such as Weapons System Software Support Facilities (WSSFs) at Williamtown and Amberley. The proposed tactics development or weapons instructor flights should include, as part of their duty statements, the capability and requirement to provide this support through software advisory committees such as exist within Tactical Fighter and Strike Reconnaissance Groups and with the various mission planning systems.

Documentation

The preferred model for tactical doctrine documentation is that of the USAF Air Combat Command, where a single command document, the ACCM-3-3, provides command doctrine to a cascading hierarchy of publications describing doctrine

specific for each aircraft type. The RAN Australian Maritime Tactical Publications (AMTPs) hierarchy could also be used as a model. In both cases, the defining difference from current RAAF documents is the centralised sponsorship and coordination between the subordinate doctrine. The parent document should relate operational and generic tactical doctrine, (eg. high order ADF publications of the ADF Warfare Centre such as ADFP 1-3) to specific tactical doctrine (eg. ADFP 23, Strike Operations, to Strike Reconnaissance Tactical Procedures). As discussed previously, it should also be cross-referenced to other tactical related publications (again using strike operations as an example, the RAN AMTI 406 - F-111 maritime strike operations). This is not currently the case. Currently Air Staff Instructions provide command instruction for flying operations. However, they are primarily focused on flying regulations such as minimum flying heights, training rules and use of medication by aircrew. The proposed document would logically fit either as a further volume, or preferably a reorganised version of Air Staff Instructions. In addition, generic weapons and range orders, which are currently spread between individual range orders and Air Staff Instructions, could be incorporated into the proposed document.

Training

The proposed organisation with its associated tactical publications will require a change in the current reliance on categorisation and currency schemes to provide the suitable level of both knowledge and process management. The proposed training regime incorporates much of the existing training courses and process, but places a more rigorous structure on the progression. In discussion with senior officers on the need for formal training, the ability to schedule and manage such courses has been highlighted as the area of major concern and one that would be impossible to manage. Yet a similar progression for staff training (Writing Skills Course, Basic Staff Course, External Studies Course, to Command and Staff Course) has long been accepted as not only possible, but strictly enforced as mandatory milestones in a professional career. This focus on the staff process as opposed to developing war-fighting professional mastery is at odds with the avowed intent of 'structured for war and adapted for peace', the current banner under which recent Defence reforms have been made.²⁹ The major changes proposed are the introduction of a structured training regime appropriate to each discipline, the introduction of an information management course for aircrew, and a 'badged' qualified weapons instructor course, again tailored to the appropriate Force Element Group requirement.

The proposed progression of training is as follows. On completion of conversion training to type, junior aircrew would undergo categorisation and currency training as is current practice. However, following attainment of 'C' category (capable of employment in primary role), the current (or a similar) Weapons Employment Course and Electronic and Warfare Course should be mandatory, in a manner similar to, say, the Writing Skills Course. Those components of the categorisation and currency scheme relating to tactics and weapons applications (as opposed to flying competencies) would be supervised by the resident squadron qualified weapons instructors. The proposed information management course would be aimed at

²⁹ It is interesting to compare this with the Australian Army, whose officer training teaches knowledge of warfighting tactics to all officers before Corps assignation and specialist training.

moderately experienced aircrew who were candidates for junior wing or group staff postings. The proposed course would comprise training in service publications management, amendment process, the related organisations including the weapons system management and the technical and logistic implications of tactical change (eg. operational air worthiness, and the stores clearance process). A further area of required expertise is the interface management required with software change and the introduction of new systems. This would include training in the conduct of configuration management boards.

The final component would be the qualified weapons instructor course, analogous to the Fighter Combat Instructor, the RAF Qualified Weapons Instructor, or USAF Fighter Weapons Instructor courses. Candidates should have a minimum of 500 hours for fast jet and 1,500 hours experience for maritime and transport aircrew. Aircrew selected should be a minimum of 'B' category, and have been exposed to all the roles of their respective aircraft type. The course itself should involve sufficient academic work to enable the students to be role specialists and capable of performing as instructors in their own right. Sufficient flying should be conducted within the course to allow students to demonstrate mastery of all the tactics of their respective aircraft. Following role specific training there should be a conjoint phase with other aircraft type students. Given the limited exposure of RAAF aircrew to large force packages, courses should culminate during a major exercise with international participation. This would then allow students to demonstrate the capability to act as combined or coalition force mission commanders.

Establishment and Manning

Following the Defence Reform Program, savings were identified to increase aircrew numbers within the flying Force Element Groups.³⁰ This paper proposes that these identified increases be used to create the Constrained Establishment and workforce associated with the introduction of Qualified Weapons Instructors to the 'Tactics Development' or 'Weapons Instructor' flights. As staff of post-graduate organisations, it is important that the crews selected for the Tactics Development Flights as Fighter Combat Instructors/Qualified Weapons Instructors be experienced senior aircrew, and could well be drawn from specialist aircrew candidates. This may require a shift in current career management practice, although a recent message calling for nominations up to and including wing commander specialist aircrew would seem to indicate this change is already underway. These individuals would have to be managed more carefully and would not be as available for extended Anyair staff postings.³¹ This is in fact what has happened with the Fighter Combat Instructors of Tactical Fighter Group by default, due to chronic shortages as a result of high resignation rates.

In some Force Element Groups however, there is an oversupply of senior aircrew at squadron leader rank, and these people could be identified as candidates for the organisation, particularly in the command component. In the case of the USAF Fighter Weapons organisation, there is a noticeable predominance of aircrew at major and even lieutenant colonel rank in supernumerary positions. There are added

³⁰ DGPERS 026 SIC WBC DTG 012310ZAPR97.

³¹ ANYAIR relates to a position that can be filled by a member of any aircrew category.

advantages in creating a Constrained Establishment at this level. Notably, it provides a non-staff avenue for advance that may well appeal to aircrew who would otherwise resign from the Service at this stage of their career, rather than accept a non-flying related staff posting. As discussed earlier, graduation from the course could be attached to a ROSO providing DPO-AF with some surety of manning. The order and magnitude of required establishment for the proposed organisation is shown at Table 1.

Table 1 - CE of TD Cells within Force Element Groups

	Pilot	Navigator	Airman Aircrew	Total
Tactical Fighter Group	8	-	-	8
Strike Reconnaissance Group	2	2	-	4
Maritime Patrol Group	2	4	4	10
Air Lift Group	2	2	2	6
Headquarters Air Command	A/R	A/R	A/R	8

These numbers are indicative only. They do not represent a major change to existing numbers. Firstly, some of the positions already exist so this represents a re-allocation. Secondly, any proposed increase is within the ambit of the Constrained Establishment identified in the Defence Efficiency Review. (For example, the establishment within Tactical Fighter Group is the existing establishment associated with No 2 Operational Conversion Unit; while the figures for Maritime Patrol Group represent a reorganisation of No 292 Squadron, and not a new establishment.) With the exception of the current fighter pilot strength, sufficient personnel currently exist within the RAAF. The manning for Headquarters Air Command is predicated on a collocated Joint Force Headquarters, where in addition to the management of tactics doctrine, the staff would provide a specialist corps capable of manning an operational headquarters air component.

CONCLUSION

The RAAF currently lacks a service-wide tactical doctrine system. There is now a number of factors which necessitate change to the management of tactical doctrine and a reduction in reliance on imported doctrine, as follows:

- a. Australia is now the unique operator of a number of aircraft variants and weapon/aircraft combinations.
- b. There is an increasing unwillingness to release foreign sourced software and doctrine, against an increasing climate of coalition operations.
- c. The complexity of the platform/weapon systems is increasing to a level such that weapon specific, specialist expertise is required for system operation and employment doctrine.

- d. As DI(N) OPS 46-3 states, increasingly tactics involve combined operations, and coordination and visibility are required above Force Element Group level.
- e. As tactical doctrine also influences the development of operational doctrine, visibility across the Force Element Groups is essential to the development of air campaigns.

The RAAF is not well-placed to exploit the knowledge edge associated with the weapons of the revolution in military affairs without a structural change within Air Command. Change is required in four areas: command sponsorship; organisation; documentation; and training. The RAAF currently lacks appropriate and formal weapons and tactical leadership training, and the necessary organisation for the development, management and coordination of tactical doctrine. The history of excellence at the tactical level of war has a considerable legacy involving the use of British and United States tactical doctrine.

The management of RAAF tactical doctrine requires the establishment of Tactics Development Flights within RAAF Force Element Groups, and a parent organisation within Air Command to coordinate the evolution and promulgation of tactical doctrine. The management of tactical doctrine at squadron, wing and command levels requires suitably trained and qualified aircrew. To qualify these personnel, who will be the instructors, developers and custodians of tactics and tactical doctrine, requires the establishment of a post-graduate course. To preserve tactical doctrine and give it a degree of permanency, doctrinal publications must be reorganised with a common format and command sponsorship.