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In October 1992, a group of World War II veterans made the pilgrimage back to the western desert to take part in the 50th Anniversary commemorations of the battles of El Alamein and Tobruk.

Desert Journey is an Australian Defence Force Journal publication highlighting the battles in the western desert and the veterans of the campaign who returned there 50 years later to commemorate the gallant struggle of that fateful time and to pay homage to their comrades who made the supreme sacrifice.

Illustrated by numerous drawings, this book will rekindle memories for those who took part in the campaign and also for those who participated in the Desert Journey of 1992.

Desert Journey will be available from the Australian Defence Force Journal at a cost of $25.00.
A Hell of a Mine

Dear Sir,

It is clear from Wing Commander Curr’s letter (ADFJ95, July/Aug 1992) that my own letter (ADFJ93, March/April 1992), about Wing Commander Curr’s article “What a Hell of a Mine”, requires further elaboration.

Helping the other arms to understand the tactical and strategic potential of airpower, and to be prepared to defend against hostile airpower, should be one of the key roles of an air force. It is equally important for an army and a navy to help an air force to understand the potential of maritime power and land forces.

Because of their failure prior to World War II to develop the potential of the dive bomber against land and sea forces, and thus to help the Royal Navy and British Army to learn to defend themselves against the dive bomber, the Royal Air Force failed in this aspect of their responsibilities to their sister services.

Although dive bombers are irrelevant today, a very important point of principle arises from this episode. That point of principle applies to the ADF today.

A key role of the RAAF is helping the RAN and Australian Army to understand the potential of airpower and to develop and train in ways of defence against hostile airpower. It is an equally important role of the RAN and Australian Army to help their sister services understand the potential of, and to develop and train in ways of defence against, hostile maritime and land forces.

Finally, I carefully stated in my letter, “Although I hold no brief for Admiral Phillips . . .”. However, a balanced historical article would have given the points in Admiral Phillips’ favour. Wing Commander Curr’s article failed to recognise the points set out in Martin Stephen’s “The Fighting Admirals”.

A.W. Grazebrook
Commander, RANR

The RAAF needs a Regiment

Dear Sir,

Sometimes we find an example of dogma that defies both logic and commonsense, usually emanating from a source under threat of existence or from a propaganda machine attempting to self destruct. Such a state is being both perpetrated and propagated by Sergeant Brasher in his latest attempt (ADFJ No. 95) to justify the formation of a RAAF Regiment.

That the Sergeant chooses to ignore the priorities of aircraft technical staff under active service conditions once again speaks for itself. I for one have very vivid memories of maintaining aircraft knowing that the enemy was just over the fence. Later, I was to learn from the diggers who had been in the field, how appreciative they were that I had been working at my trade. “Slicks, Bushrangers and Wallabies” were literally life blood to those in contact with the enemy. To illustrate my point, I invite the Sergeant to enter any aircraft technical section within the RAAF and read to the members present his last two literary efforts to the ADFJ. I am sure he will be warmly received and very quickly learn why an Airforce exists.

With the never ending tightening of monetary policy, does the Sergeant really expect the Defence Department (RAAF) to spend millions of dollars of taxpayers money, duplicating units, equipment and manpower that already exist in the ARA, just to satisfy those few members who now find they joined the wrong service!

As I and my technical colleagues have more constructive pursuits within the “Blue Reality”, we’ll gladly leave the “Green Exposure”!, to the likes of Arnold Schwartzeneger, Chuck Norris and Sergeant Brasher.

D.E. Hadfield
Flight Sergeant

Airpower

Dear Sir,

Air Commodore Ashworth and Wing Commander West have written knowledgeably about the theory of Air Power, but my contention remains unanswered. Unlike any other country of similar capability air support is not guaranteed in our doctrine.

If the words of the doctrine are equivocal on this issue and make much of the exception rather than the rule; if training is based on an open ended commitment; if air commanders at every level believe they can withhold their support or change the arrangement, easily and without warning, the Navy and the Army face a real problem.

Mark you, it is not a new problem, but there have been twenty years since the last active engagement to fix it.

D.M. Butler
Major General (Ret.)
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Independence or Professional Mastery

Comment by the Director of the Air Power Studies Centre—Group Captain Gary Waters

RAAF air power doctrine, published in the AAP 1000, articulates one of the fundamental maxims as the need to exploit the full potential of the air environment. According to RAAF doctrine, this can only be achieved through specialised training so as to provide 'a level and depth of expertise necessary for planning, directing and executing all aspects of air power'.

This argument for professional mastery in the air environment is no different to similar arguments for professional mastery in the two surface environments of warfare.

In promoting this notion of professional mastery, the RAAF chose to use the term 'independence'. Having chosen such an emotive word, it is not surprising that the RAAF has found its use of the term to be one of the most-frequently debated points in its doctrine. Moreover, in choosing such a term, the RAAF itself has placed too much focus on the need for an independent organisation.

The issue of first principle is not one of independent organisation, but rather one of professional mastery. The RAAF would then argue that this mastery is best achieved through an independent organisation. Hence, independence is more an organisational manifestation of the first-order principle of professional mastery. Professional mastery therefore should be the maxim.

This maxim (if you will) of professional mastery, viewed in the Australian context, assures the nation that its defence force can attain maximum effectiveness in the use of the air because it is organised and trains to do just that. In like vein, the specialist arms of the RAN and the Australian Army assure that nation that its defence force can attain maximum effectiveness at sea and on land as well.

One of the most important statements in the AAP 1000 has been clouded by a concentration of focus on the term 'independence'. That statement is 'because the Air Force is not discrete, it works with other forces in joint operations so that synergy of small, but environmentally different forces, can be co-ordinated for best effect'.

This is the heart of the matter — an ADF operation along joint lines and involving the 'highest degree of intimacy' of the three Services, with each specialising in its own environment but nevertheless well-versed in the intricacies of joint warfare. The three forms of combat power are complementary and interdependent. An important observation to emerge from the Gulf War was that joint operation do not obviate the need for doctrine, operational art, tactics, techniques and procedures in the unique environments themselves.

This difficulty that the RAAF is experiencing in the 1990s is no different to that experienced during World War I and expressed so well be Air Vice Marshal H.N. Wrigley in his diaries (cited by Brendan O’Loghlin and Alan Stephens in The Decisive Factor). AVM Wrigley argued that the expression 'independent' implied that 'the Air Force would carry out its operations without any regard to what the Navy and Army were doing or what the policy of the Government was...'. He went on to say 'such an idea is of course entirely wrong, but it shows the pitfalls into which an unfortunate nomenclature may lead the unwary...'

Thus it is incumbent on the RAAF to ensure that military doctrine is not clouded by the RAAF clinging to a long-outdated term such as 'independence' and thereby detracting from the doctrinal importance of a strong Navy, Army and Air Force. The time is right for the RAAF to sign up to the maxim of 'professional mastery'.

As the recently-appointed Director of the Air Power Studies Centre, I will be presenting this recommendation to the Doctrine Review Board later in the year, with a view to removing the term 'independence' from the Air Power Manual, replacing it with 'professional mastery', and re-wording all relevant paragraphs.
In February 1992, a group of World War II veterans made the pilgrimage back to Singapore to take part in the 50th Anniversary of the Fall of Singapore.

_Singapore Diary_ is an _Australian Defence Force Journal_ production. It highlights the fall of Singapore during World War II and the veterans of that campaign who returned to Singapore to commemorate the gallant struggle of that fateful time and to pay homage to their fallen comrades.

Illustrated by numerous drawings, _Singapore Diary_ tells of the Japanese invasion of the Malay Peninsula culminating in the assault on Singapore Island in February 1942.

_Singapore Diary_ is available from the _Australian Defence Force Journal_ at a cost of $20.00.
Introduction

The defence of Australia, particularly in the North, by the Australian Defence Force (ADF), to prevent a hostile force 'gaining a foothold on any part of our territory', will require close coupled tactical support for the surface commander. The means of providing this tactical support, from land, naval or air forces, must be capable of reliable and immediate reaction to the surface commander's directions in meeting an unfolding battle situation that is unable to be appreciated from any other viewpoint but his.

This need is at odds with the role conflict that has developed within the Royal Australian Air Force (RAAF) since the end of the Pacific War. Provision of low level, ready reaction tactical Close Air Support clashes with the strategic deep strike and air superiority roles of the RAAF (essentially, the Control of the Air campaign). This has been tacitly recognised by the RAAF in handing over the operation of battlefield helicopters to the Army. Asset procurement has progressively skewed RAAF equipment capability to meet these strike and air superiority roles. This process has degraded the probability of these assets being deployed in the close support role against the most feasible small scale incursion 'as the F-111 and the F/A-18 ... are likely to be of little use.' The RAAF has evolved into, effectively, a strategic arm as the extreme cost of its equipment has steered its concentration on this contribution to the ADF. This expensive inventory, restricted in its sophistication to coping with only the most conventional of defence threats, has led the RAAF to the doctrinal rationalisation that it has 'potential to substitute air power for land or sea power' and that it 'seems pointless ... to draw the distinction between tactical and strategic air power'. Thus, to the RAAF, surface combat, especially on land, may have little future advantage in national defence and should not represent a significant claim on air power assets.

That this strategic role must predominate is also propounded by the RAAF in a recent officially sanctioned paper, 'The Leading Edge'. The view of the Chief of the Air Staff's (CAS) office, as expressed in this paper, is that RAAF assets must be controlled at the highest, that is, strategic, level; namely by the Chief of the Defence Force (CDF). Primacy of RAAF assets and their strategic role, in the authors' words, is necessary as 'The dispatch of such limited and valuable resources ... on missions against even some regional forces should not be considered or condoned ...'

However, the CDF, or any Commander in Chief, will rarely have an intimate feel of the developing 'immediate battle' afforded the local surface commander. Physical remoteness, communication delays and even disagreement could lag the response of tactical air support assets, in the CAS model, to the point of ineffectiveness. Recent conflicts have shown that 'Thirty per cent of ... (available air effort was used for) immediate or troops-in-contact situations.' and that for 'ground forces ... very high local mobility of firepower ... (is) probably best provided by organic helicopters' and other suitable aircraft. RAAF doctrine and equipment are incompatible with the very real air power need to provide 'aircraft ... as flexible long range artillery in close air support'. The RAAF now proposes that the strategic role as the only justifiable employment for its assets. This has left a doctrinal inconsistency that has come about due to the absence of attention to the Close Air Support requirements of the surface commander in the intimate battle, particularly the land battle. RAAF thinking discounts the land battle, focusing its attention on the northern 'sea-air gap', and maintains that if they are unsuccessful and the enemy 'does land in strength, we will have lost anyway.' Thus, the 'Thirty per cent' capability has been atrophied as a doctrinal concern and equipment requirement in the RAAF but still remains a vital need in support of ADF surface operations.

There is a need, then, to evaluate the means, within the ADF, to provide timely, flexible and organic tactical
air support to surface commanders, maritime or land, in an economical, reliable and effective manner. There is also the need to resolve the effects of the role conflict within the RAAF, between its tactical and strategic demands. This article discusses both these needs in the concept of the Tactical Air Support Group (TASG).

The article will:

a. Examine historical trends in operational control and deployment of tactical air support in surface battles.
b. Show that the RAAF, from its published doctrine, has discounted the surface battle in its approach to its role.
c. Suggest a low cost but high utility solution to the current degradation of Close Air Support in the ADF, the Tactical Air Support Group.

Because of space limitations, emphasis will be on examining the Close Air Support requirements of the land battle. This is not intended to ignore the very real needs of the maritime surface commander but merely to indicate it is a subject worthy of additional debate within the framework of Close Air Support to the ADF.

**Historical Trends**

Even early air power theorists initially conceded that its application was to enhance the decisive surface conflict. The doyen of air power, Trenchard, initially "sought air superiority ... over the battlefield" until, with Mitchell and Douhet, the litany of "massed bomber fleets" became dominant in expounding of doctrine in the years between the world wars. The RAAF current perception of itself is as a classic instrument of the tenets of Guido Douhet, in his "Command of the Air", where the "most effective form of operations" is "the strategic offensive". These proponents of air power all focused on the bombardment firepower of stratic bomber fleets that would attack enemy 'vital centres' and opposing air forces. Such a form of warfare, they held, should relegate land and sea forces to the sidelines in resolving future wars; the putative 'Substitution' concept. An American general even said "high performance bombardment aircraft, together with the reconnaissance planes of superior speed and range will suffice for the defence of the country." The thrust of debate, emanating from the RAAF, albeit transposed to an Australian context and sixty years later, has an eerie ring of this earlier struggle by northern hemisphere military aviators for their perception of recognition. One outcome of that earlier debate was that 'attack planes — light bombers and fighter-bombers

for close air support of ground operations — were almost ignored.'

From this period one nation, Germany, after briefly pursuing grand strategic air power (Weyer's 'Ural Bomber' project), gained different inspiration from the 'Expanding Torrent' theories of Liddell Hart, whose ideas linked air power to the other radical weapon, the tank, and to the land battle as the decisive direction for its application. The German military developed clear doctrines of air power that were meshed to winning the surface battle. The Luftwaffe 'was independent but, nevertheless, harnessed to the Clausewitizian concept that the primary object in war was the destruction of the enemy Armed Services.'

Attention to the Luftwaffe's development can indicate sound principles of tactical air support that were, essentially, reflected by other air forces as they sought to emulate the effectiveness of its 'Blitzkrieg' techniques. From the onset, and in spite of the pervasive influence of the classical air theorists, the German High Command realised that technical limitations would always constrain air power from being the decisive arm. Rather, the Luftwaffe would always act in concert with the Wehrmacht, and to a lesser extent, the Kriegsmarine. Great attention was paid to cross training army officers and non-commissioned officers as observers in reconnaissance squadrons and, both in basic flying training and at the Air Command and Staff School, to train young flyers in 'the science of Army Tactics'.

This had the very real benefit of giving Air Force officers, particularly air crew, a proper military education grounded in an appreciation of those elements of their defence forces that were actually decisive.

From this realistic appreciation of operational needs, purpose designed aircraft for Army support were built and tested, finally proving their worth in the Spanish Civil War. Rugged and manoeuvrable, types such as the Heinkel 126, the Junkers 87 divebomber (the 'Stuka') and the Henschel 129 were never intended to take part in the air superiority battle but to be part of the Army's means of extending and concentrating firepower at decisive points. Thereafter, although the Luftwaffe retained operational control of the majority of its aircraft, tactical reconnaissance, dive bomber and ground attack aircraft were, effectively, permanently allocated to the ground commander. Fighters, particularly the Focke Wulfe 190, with its wide track undercarriage and tough air cooled engine, were switched to ground support roles, when the enemy air threat had been neutralised, by the attachment of bomb clips. The Dornier 17 twin engined bomber, although designed for a strategic and interdiction role, was used for Army support due to its high speed.

'Blitzkrieg' tactics depended on, firstly, applying
The F111C is the RAAF's front line strike aircraft.

overwhelming force at the breakthrough point and
then, with air power, armour and artillery, bypassing
strong points and paralysing the enemy's rear areas. These
tactics, spawned by Liddell-Hart's theories, but
also a development of older Prussian Army doctrines
of 'Envelopment' battles, thus incorporated the Luft­
waffe into mainstream military operations. This avoid­
ed an imbalance of emphasis toward Air Superiority
and Strategic Bombing theories that, in the latter case,
ultimately proved sterile. The classic military dictums
of Concentration and Surprise were exemplified and
characterised in 'Blitzkrieg' operations by a 'piling up'
of assets to ensure a result at the decisive point. Aircraft
were merely another, albeit potent, means of applying
force, in the same category as assets such as Artillery
and Armour, but not distinctly different.

Mobility, short flight times and immediate reaction
were necessary from the Luftwaffe to match this fluid
warfare. This necessitated little reliance on fixed bases
by operational squadrons and colocation by Luftwaffe
and Army headquarters. Squadrons followed their
Army units or the unfolding battle, 'lodging' with inde­
dependent airfield companies who operated and pre­
pared the tactical airfields. Difficulties arose when
'Luftwaffe command units were not based forward'
but improved the further forward command and con­
trol elements moved with the ground combat units.

Ultimately, in Greece and Russia, liaison teams and
forward observers were in the frontline, directing air­
craft to targets nominated by the immediate infantry or
artillery regimental commanders. Also, in Russia, the
value of smaller units, two to three bomb carrying air­
craft, was recognised in their greater flexibility and
manoeuvrability and that they could attend to targets
too small for larger units. The combined air and land
forces of Germany were

'self contained. Stukas, tanks, recovery vehicles,
petrol wagons, anti-tank gunners, all went forward
together and their senior officers were often in the
van.'

The German General Staff calculated that, between
1939 and 1942, aircraft were employed in the ratio of
5:4 for Strategic as to Direct Support roles. This would
include fighter and suitable bomber aircraft detached
after the air superiority battle was won. However, the
actual number of aircraft used for direct Army support
was more modest and could not, at any time, have been
considered an imbalance against the Luftwaffe's other
missions. At the beginning of the French campaign, of
3,824 operational aircraft, there were 342 dive bombers,
42 ground attack and 501 reconnaissance. Similarly, in
Russia, with 3,701 operational aircraft, 302 were dive
bombers and 593 reconnaissance. However, close tacti­
cal support is always accompanied by high attrition in
Aircraft; if not in crews, due to aircraft being downed from low-level and mostly in reach of friendly forces. By the battle of Kursk, both the Germans and the Soviets had come to expect destruction to be almost equal amongst aircraft and tanks. The Red Army fielded 3,600 tanks and 2,400 aircraft, the Germans, 2,700 tanks and 2,000 aircraft. So, whilst purpose designed close air support types have always been a small proportion of total air resources, in an intense surface battle, high levels of attrition of air assets, as well as armour and artillery, came to be expected and allowed for.  

The Luftwaffe was not merely an adjunct of the Wehrmacht. From the outset its doctrines were meshed to the theories of Doughtet. Indeed, whilst those theories were seen as fundamental in defining the singularity of the service, the Luftwaffe contrived an effective manner to reconcile the unique properties of airpower without ignoring the needs of the land battle or indulging in naive dismissal of surface forces as obsolete. The German Air Ministry field manual, "The Conduct of Air Operations", which lay down doctrine, stated the overriding mission was to "secure and maintain air superiority" and only then to provide "combat and other air action supporting army forces on the ground". The "Air Field Manual No. 16" went further, stating the prime missions as "strategic operations against sources of hostile military power" and "attacks against targets in large cities."  

The Luftwaffe always figured about forty per cent of its strength would be bombers, twenty five to thirty per cent fighters, and the rest for the support of ground forces, including transport. Its first two phases of operations were to attack and destroy enemy air forces and aircraft factories and then "vital centres". But always included was the intention to aid the Army in its decisive engagements. For this reason, purpose built aircraft, such as the Junkers 87 divebomber, were permanently under command of the Army to "concentrate all striking power" with the service best able to judge its effective application in the land battle.

Control of the Luftwaffe was always at the highest level with the Commander in Chief of the German High Command and, whilst there was general agreement that Air Superiority forces stayed under the command of the Luftwaffe, fighter units were assigned to Army control when circumstances justified such a change. In effect, they became specialist Army units and both services planned and trained for this as a normal part of operations. The Army local commander directed Luftwaffe units as he was best qualified to direct their activities, whilst in no way interfering with the technical command of Air units.  

It is a common fallacy that the Luftwaffe was only ever the air arm of the German Army. Examination of its own doctrine refutes this. Its performance in gaining air superiority in Europe, from 1939 to at least 1943, and in the Western Desert up to the First Battle of El Alamein, and then its consistently determined defence of Germany against the Allied bomber offensive, gives the lie to such criticisms. But it never lost sight of the inescapable reality that, if ever it was to be credible, it must be part of the land battle. It took the Air Forces of its opponents several gallant years to reach the same conclusion and to begin to copy the principles that the Luftwaffe had established for effective support of the Army.

The principles that the Luftwaffe experience showed to be successful in the Air Arm's support of the land battle can be now drawn. Those principles, for the use of air assets for Close Air Support, are:

a. Operational command by Ground Force Commander.

b. Forward location, preferably within short flight time of in action combat elements.

c. Control by Air Arm personnel or fire support control specialists with leading combat elements.

d. Maximum and early use to assist in either breakup of aggressive enemy ground concentrations or, in assault, breakthrough with disabling concentration and surprise.

e. An irreducible proportion of specialist Close Air Support aircraft, organic to the Ground Force and commanded by it and not available (or suitable) for Control of the Air tasks.

f. Side-by-side location and direct command links between Ground and Air Arm headquarters appropriate to the ground battle.

g. Flexible and forward deployment delinked from fixed bases through use of independent airfield operating squadrons.

These principles all support the overriding Clausewitzian one that destruction of the enemy force is the fundamental aim in battle. Adherence to these principles has determined the success or failure in the use of air assets in Close Air Support operations.

The Desert Air Force, as fashioned by Air Marshal Conningham in the Western Desert after the bitter lessons dealt by the Afrika Korps and the Luftwaffe in the retreat to El Alamein, was the first effective answer by the Royal Air Force (RAF) to their paucity of Close Air Support tactics and operations. This deficiency, leading to the non-availability of fighters, had contributed to the fall of Tobruk. To his credit, and despite later lapses, Coningham duplicated his opponent's techniques, moving his headquarters into the desert alongside that of the 8th Army (then commanded by Ritchie), ordering his pilots to "avoid independent combat...and concentrate on giving support to the ground forces." He developed methods of forward control and
holding squadrons or groups of fighters ready to provide immediate assistance to any sector. Complete integration into the land force, 'without regret or rancour' was achieved and almost immediately reduced the effectiveness of the Afrika Korps in the land battle. In this regard, the Desert Air Force headquarters and units stayed closer, at one stage, than the army's, keeping 'fighters going until (enemy) tanks were within ten miles of their fields' during the Battle of Knightsbridge (First Alamein). This delayed Rommel's forces for several, vital days.

Montgomery, on taking command of 8th Army, recognised the soundness in Coningham's initiatives and confirmed them by moving 8th Army Headquarters back into colocation with the Desert Air Force. This was as much due to Montgomery having already formulated his own ideas on the use of Air that closely matched those of the Wehrmacht and the Luftwaffe and were tied totally to success on land. Coningham recognised this also, ensuring, in his words 'the Army and its Air Force are welded into one entity ... right down to the individual soldier and airman.'

These "Luftwaffe" methods proved outstandingly successful in the 8th Army's campaign that pushed the Axis forces out of North Africa. Their efficacy culminated in the attack on Tunis in 1943 when 1,000 sorties were carried out by the Desert Air Force on one day before 0900 hours when assaulting troops crossed the start line. It was only when these principles were breached that air power ineffectiveness occurred. Before the invasion of Sicily, Air Marshal Tedder, the Air commander, refused to entertain even the most basic of joint planning. Resistance to combined headquarters for army and air staffs resulted in no coordination of resources prior to the invasion. Tedder insisted on 12 hours warning of Close Air Support tasks and 'did everything to sabotage direct support'. In the end, the land battle commenced before the air battle, mainly due to ignorance by Tedder's headquarters of overall planning.

However, by the time of planning for the invasion of Europe, the effectiveness of the Desert Air Force methods was firmly entrenched in the organisation of Allied Tactical Air Forces, as distinct from the strategic assets of the RAF and United States air arms. They are best expressed by Air Marshal Broadhurst, who
developed the ‘Taxi Cab Rank’ technique of on call fighter ground support.

‘... every pilot ... allotted specifically for the support of the army, must realise that his sole job is to help win the land battle ... it involves coming right down and ... shooting at ground targets. (We are) one entity (with) side by side headquarters.’

Application of this principle of unqualified cooperation was so effective that ‘Wehrmacht ground commanders commented on the blanketing effect of the Allied tactical air forces on the German formations trying to advance to the Normandy battle area’.

Nonetheless, separation of air headquarters from Montgomery’s forward invasion headquarters in Normandy caused panic when the German counter attack was interpreted by the ‘Air Barons’ as imminent failure by Allied ground forces. Air resources were withheld at a crucial time in securing the Allied bridgehead. It took a flight to France by Air Marshal Leigh-Mallory to visit Montgomery in the field before this interpretation was revealed as incorrect. Leigh-Mallory, correctly appreciating that, rather than failing, the Allies were on the brink of a breakout, decided to reinforce Montgomery’s success and immediately offered 5000 aircraft, over the protests of Tedder across the Channel at higher air headquarters. He saw the truth of Montgomery’s words, in the planning of ‘Overlord’, when the Field Marshal advised, ‘The land battle will be a terrific party and we will require the full support of air at all time, and laid on quickly.’

Milne Bay and the Australian Experience

The circumstances of the Australian victory in New Guinea at Milne Bay, in August and September of 1943, are well known. Imperial Japanese forces, in a planned amphibious invasion, a type of operation in which they had hitherto been unbeaten, were defeated for the first time on land by the combined efforts of Australian ground and air forces under the command of Major General Clowes. Crucial to this success was the failure of Japanese ground forces ever to lodge an effective beachhead or gain command of the two critical airfields, built and maintained by army engineers. As an example of Close Air Support, it is a classic application of all the principles that have been enumerated. Two RAAF Kittyhawk fighter squadrons, 75 & 76, commanded by Wing Commander Thomas, acted in direct support of the Australian Army, under command of the Ground Commander. The Kittyhawk, long outdated by the Japanese Zero, had become a ground support mainstay. The squadrons operated within 5 minutes flight to army units in contact, at one stage from an airfield under direct attack. Conditions, verging on impossible, did not stop Close Air Support sorties. Number One strip was virtually ‘underwater, bogged in deep mud’ that caked so continuously in aircraft that control surfaces and mainplanes were constantly replaced. No thought of aircraft preservation was considered by the RAAF, nor was there any thought that the land battle was anything but the only focus of their operations. Commanders at company and platoon level identified targets to the pilots directly and ‘probably never before had squadrons been based so close to troops in action. This was airborne artillery in its most literal sense’.

The RAAF Kittyhawks wore out 300 gun barrels and fired 196,000 rounds and, at the successful end of the battle, were mechanically spent. But the Japanese had been stopped virtually at the shoreline and further application of air assets to that particular aim was unnecessary; the land battle was conclusively won. The spirit of unity was mutually expressed by General Clowes when he signalled ‘the success of the operations was ... due to ... incessant (RAAF) attacks over three successive days (that) proved the decisive factor in the enemy’s decision to re-embark’ and by a RAAF pilot stating ‘the Australian soldier must be ... the best in the world. We’ve seen him fight and if anyone tries to tell me anything different I’ll punch his nose.’ 75 and 76 Squadrons, besides setting a peerless example of military professionalism and duty, laid down a realistic example and operating framework of effective Close Air Support for the Army that in no way usurped or diminished other RAAF tasks. Later, in the New Guinea campaign, Wirraway and Boomerang aircraft, medium speed, agile aircraft of Australian design and manufacture and well suited to army cooperation, were regularly used in single or two aircraft sorties for bombing and machine gunning. They were normally controlled over the target by army officers who also acted as artillery forward observers, using the same communication net and coordinating both ground and air support to achieve the best result for the Infantry.

Despite the close, harmonious and, above all, effective pattern of RAAF and Army cooperation that grew from the New Guinea campaigns, at about the same time a bitter, prolonged and irrational internecine dispute, described as ‘the RAAF Command Scandal’, was setting a pattern in RAAF corporate attitudes toward either delegated or centralised control. The CAS, Air Marshal Jones, over a period of eighteen months at the most crucial time of the South West Pacific campaign, mulishly insisted on all RAAF
assets being controlled by his Headquarters in Australia, subsuming even the authority of South West Pacific Command and, therefore, General MacArthur. The tactical RAAF Air Commander, Air Marshal Bostock, appealed against the unworkability of such a command structure, particularly as operations moved further along the island chains from mainland Australia during the protracted and politically damaging wrangle with the CAS. In this he was supported by General Kenny, the overall theatre air commander, for the same entirely practical reasons. However, Jones remained obdurate, even after appeals from MacArthur, and Prime Minister Curtin and other senior officials. The final resolution favoured the sanity of Bostock’s localised command but also set up organisational tensions resulting from this dispute on role conception within the RAAF. Previous interlocking role systems became divergent, with centralism identified with strategic ‘Air Power’ tasks and delegation with tactical ‘Close Air Support’ tasks as two ends of a performance scale that possessed increasing tendencies to organisational disequilibrium. Resolution of these conflicts drove the RAAF, after the Pacific War, to increasingly embrace the strategic function as the preferred concept that would restore organisational equilibrium, and to focus its energies here almost to the exclusion of the tactical. Examination of RAAF operations since the Jones-Bostock schism, and current doctrinal evolution, bear this conflict resolution out.

During the Korean War, the RAAF did not exclusively support Australian Army units, although its main tasks were those of Close Air Support to United Nations forces. Its Meteor and Mustang aircraft, not possessing the performance for Control of the Air tasks, dictated this type of use. Consequently, the role conflict dynamics were subverted by equipment limitations and, to all intents, RAAF operations were almost a continuation of the Pacific War style of locally directed tactical sorties. In the Malayan Emergency, though, RAAF operations took on aspects of centralism in that their missions were almost totally directed to strikes against Communist Terrorist ‘Centres of Gravity’ and controlled by a RAAF command only nominally integrated with the ground conflict being waged almost exclusively by infantry. Employing a strategic bomber, the Lincoln, almost 4000 sorties were carried out against Communist terrorist targets. The result of this RAAF activity from 1950 to 1960, where almost 30,000 tons of bombs were dropped, delinked from the surface conflict, was 23 confirmed terrorists killed. Targets in low level conflicts and in terrain such as Malaya tend to be elusive and confusing to the airman if he is not guided by ground forces. Although we are examining the Australian experience, examples on a larger scale from United States operations in Vietnam provide illumination of these difficulties that tend to self reinforce in the absence of Ground Force guidance or intelligence.

The United States Air Force (USAF) began operations in South Vietnam in 1961, under the aegis of advising the South Vietnamese. Gen Anthis commanded its major unit, 2 Air Division. This grew with escalation into the mighty air effort fielded by the United States. However, Anthis, operating independent of the ground objectives, ‘began inventing targets to keep the growing number of planes busy ... the more the Air Force bombed, the bigger its role.’ The refined logic of insurgency warfare, based on incremental control of the population and isolation of the legitimate government and so different to the European environment that spawned the classic air theories, continued to elude the American and Vietnamese pilots and their commanders. They continued to bomb the most visible man-made structures that had little to do with fighting the insurgents, who needed to be rooted out through painstaking infantry operations. It seemed to USAF leaders that the war in South Vietnam was an ‘essentially conventional conflict masquerading as a subtle and complicated counterinsurgency ... a threat to Air Force interests since (it) placed renewed importance on a ground effort’

Yet when this mighty air weapon was wielded in direct support of ground forces, the results were almost always decisive, from the smallest ground action to the most complex. Ground directed air operations turned the situation around in the ‘Iron Triangle’ during 1967. Air strikes in support of the siege of Khe Sanh held by a United States Marine Corps garrison were instrumental in securing the ultimate success in this two month battle. A feature of Close Air Support in Vietnam, highlighted by Khe Sanh, was the greater effectiveness of less powerful aircraft. The ‘regimental commander (was) impressed by ground controlled radar bombing by lesser craft (than the B52) which better met his pressing need.’ Elsewhere, obsolete aircraft such as World War II vintage, piston engined Skyraider and modified C47 gunships were ‘better able to meet the needs of ground units than were fighter units bought in by FACs.’ The most spectacular instance was the direction of B52 ‘Arc Light’ strikes, normally a strategic preserve, by the United States Corps Commander, Vann, in the Battle for Kontum. The North Vietnamese
Army (NVA) attacked the city in corps strength. Vann ‘laid the best part of 300 B52 strikes in the environs of Kontum’ over the three week battle, that he personally directed into enemy concentrations. In spite of this, one NVA division broke through, with 10 T52 tanks (out of 40), but were held by the South Vietnamese infantry and forced to withdraw.’

Technical control of these ‘Arc Light’ missions may well have remained with the USAF, but the ground force commander was the only person with the intimate knowledge to place their munitions to effect the battle, which was still a close run thing finally decided by the infantry defence of Kontum.

The RAAF deployment to South Vietnam was under the nominal command of the Commander, Australian Force Vietnam (COMAFV), Major General Wilton. From the outset Wilton was worried by ‘the Air Force lack of appreciation of joint operations’. The CAS, Air Marshal Murdoch, had forcefully expressed his indignation that RAAF squadrons were commanded by ‘an Army general’ and, earlier, both the CAS and Minister for Air Howson had ‘strenuously opposed ... RAAF under army control’; this despite the fact that the Army had the prime mission to be supported in Vietnam and that COMAFV could theoretically have been a naval or air force senior officer. This was a tangible embodiment of the working out of the role conception conflict within the RAAF to the point where it now considered that not only should its air operations be separate from tactical requirements but that only its officers were fit to direct them. The RAAF ‘Directive to the Commander Royal Australian Air Force Component Vietnam’, signed by the CAS, pointedly located the Task Force Air Commander (and the Commanding Officer of 9 Squadron, Wing Commander Scott) at Vung Tau, 20 kilometres from 1 Australian Task Force (1ATF) headquarters at Nui Dat and insisted that duplicates of his reports to COMAFV were to be sent to the CAS personally. The Department of Air, thereby, continued to attempt to ‘command RAAF operations from Australia’ in exactly the same manner as Air Marshal Jones had twenty-five years earlier. The spirit of Milne Bay, and that of ground and air force unity, had withered as the correct application of the principles of Close Air Support.

The most potentially detrimental development was the insistence that ‘Air Board regulations, framed for peacetime, should apply’. Strictures, included 9 Squadron Iroquois helicopters not operating ‘into insecure locations’ or undertaking roles that were ‘offensive’. This exhibited an unawareness by the RAAF of the requirements of the ground force in South Vietnam and, by inference, restricted the Army to secure locations, where the enemy were unlikely to be, if they wished to be supported by 9 Squadron. The unworkability of such constraints in war operations caused Major General Mackay, at one stage, to ground 9 Squadron. A request from COMAFV for RAAF Canberras, based at Phan Rang, to perform a photo-reconnaissance of Phuoc Tuy province was rejected by Department of Air on the grounds that ‘the Canberras were there (in Vietnam) to give the pilots combat experience before they went to the United States to convert to Phantoms’. Both the Caribou and Canberra squadrons were effectively part of the USAF, in that service’s remote and unsynchronous operational environment described previously, and which fitted well the RAAF strategic role concept. Therefore, apart from the helicopters of 9 Squadron, 1ATF had to rely exclusively on USAF and US Army Aviation for offensive Close Air Support.

At the time, though, excellent ground attack units, the Avon Sabre squadrons, were doing nothing more than peacetime training in Australia and on deployment to Butterworth in Malaya. Although subsonic and obsolete for the Air Control role, if based at Vung Tau or Bien Hoa, they could have provided exclusive and organic Close Air Support for the 1ATF commander and Australian ground forces in Phuc Tuy. Short flight times and dedicated tasking to 1ATF could have given assistance over the period of Australian involvement. It could have been another classic example of support to the ground forces in the Milne Bay mould and, quite possibly, just as noteworthy. Instead, the closest the RAAF came to using Sabres in Vietnam was a small detachment to Ubon, Thailand, for airfield defence — this in a situation when hundreds of Mach 2 Phantoms flew from this airfield daily on sorties to North Vietnam. It was almost as if the RAAF were now fighting in a war parallel to that which included the land battle and did not concede any of the operational principles that had produced such outstanding cooperation in the Pacific War.

If we consider Milne Bay as the Australian apex of the correct application of the principles of Close Air Support, the Battle of Long Tan represents its nadir. Again, the circumstance of the battle fought in Phuoc Tuy province five kilometres from Nui Dat are well known. On the afternoon of 18th August, 1966, D Company, 6 Battalion, Royal Australian Regiment, met and held a regimental strength force of Viet Cong and NVA for three hours. In drenching rain, this one infantry company, aided by intense artillery support, forced the enemy to stop its move toward the 1ATF base until relieved by cavalry and infantry, which forced the enemy to withdraw. This one battle was pivotal to the survival of 1ATF and, at a crucial time in its progress, RAAF support was available only because
The Black Hawk helicopter provides the Army with a high level of battlefield mobility.

of the conscious decision of one pilot to disobey orders and that of a senior RAAF officer to both encourage and turn a blind eye to that disobedience. If Air Board orders had been followed, the RAAF would never have flown in support of the Long Tan battle.

The Task Force Air Commander, Group Captain Raw, a World War II veteran aware of the needs of ground forces, was at IATF headquarters when the battle commenced. Fortuitously, so were two 9 Squadron Iroquois, commanded by Flight Lieutenant Riley, which had transported a concert party to Nui Dat. Otherwise, no 9 Squadron aircraft would have been on station, or likely to have been released from Vung Tau given the ‘insecure’ and ‘non offensive’ restrictions on their operations contained in Air Board orders. Both of the RAAF officers were aware of these orders, more so Raw, who was also the RAAF Commander, Vung Tau. D Company was facing a desperate lack of ammunition, calling artillery fire almost on their position to break up enemy attacks and on the verge of being overwhelmed. Riley overheard all this from radio traffic. In spite of objections by one of his pilots on breaking Air Board directives that would risk aircraft and that they ‘would be killed’, Riley, on his initiative, offered to fly ammunition to the beleaguered infantry ‘at all costs... to support fellow Australians in difficulty’, taking all responsibility as detachment commander. One other pilot, Lane, also volunteered to fly, alone if necessary. Raw immediately authorised Riley’s mission, more closely aware of the dire situation of D Company and that the Iroquois was the only aircraft capable of the task. He declined to advise 9 Squadron at Vung Tau to both save time and to avoid creating a situation for Scott where he may ‘not have been in a position to authorise it.’ D Company received the ammunition re-supply, delivered by Riley’s two aircraft and their crews, in appalling visibility and rain, without gunship cover and into the teeth of intensive small arms fire, and the battle was saved. The analogy with Milne Bay is telling in all but one respect; Riley’s airmen flew the sortie in support of D Company in spite of RAAF policy, not because of it. To their everlasting credit, the integrity and courage of Riley, the prowess and devotion of his 9 Squadron aircrew, the sense of duty and sagacity of Raw, all honoured the legacy of Milne Bay. All had recognised, in the furnace blast of combat, the insistent imperative of the land battle.

The excellent support that eventually was provided by 9 Squadron to the Special Air Service squadron at Nui Dat is often cited as proof that the RAAF corrected its ways. It overshadows the fact that this was support to one specialist infantry company out of a minimum of 13 rifle companies that comprised the infantry strength of IATF. As late as 1971, 9 Squadron
still refused a request from a company commander to extract his soldiers from what they considered a marginal landing zone, the task being completed by Royal Australian Navy Iroquois operating with the US Army. (In another instance in 1971, a 1ATF operational task was ignored to give a senior RAAF officer his Iroquois endorsement). Support of these mainstream units continued to come mainly from US Army Aviation and USAF resources, as they had from the beginning of Australian involvement. It could be said that RAAF involvement in Vietnam was almost inconsequential to the conduct of Australian ground operations in that war.

Some indications of the RAAF approach to Close Air Support may be gained from its procurement of equipment. This process has led to the absence of any specialist ground attack aircraft currently in the RAAF inventory, nor plans to acquire them. In the selection process to replace the Mirage, the FA/18 won primarily on its merits as an air control weapon, a choice reinforcing the preferred strategic centralist model. It had more to do with the RAAF ensuring it got the equipment that allowed it to perform its preferred role than any judicious examination of what it should procure to meet the needs of the ADF across a broader spectrum of operations. Once acquired, this aircraft is too costly and hard to replace to risk in the high attrition environment of Close Air Support of the land battle. Not surprisingly, a corollary arises which states that the Control of the Air requirement will be so exacting of this new asset that it is unlikely ever to be available for Close Air Support. Thus, uniquely for the ADF, a Close Air Support gap was created between the FA/18 and the field howitzer. This gap, filled by aircraft such as the A10 in the USAF and the Jaguar in the RAAF, emerged as the poor cousin in RAAF operational policy and became enshrined in doctrine.

Performance of the RAAF in major ADF exercises provides actual examples of the measure of support the land commander can expect. A good case is the first test of the small scale incursion, Exercise ‘Kangaroo 83’ (K83). Examination of the after exercise reports, where they concern air matters, encapsulate key issues and are best summarised in the major concern that ‘the circumstances of the ultimate user (the rifleman) should be borne in mind’ but were not well served as ‘RAAF Tactical support tasking agencies did not provide a timely response’. Other concerns expressed were:

a. Command of Air Assets. Always contentious and still characterised by the inability of the land commander to gain adequate control over the air assets needed in time to meet his mission. ‘Tactical air should be controlled by the tactical commander’ and ‘in the first instance.’

b. Headquarters. Their location and procedures, especially in initial poor response times, manifested the ‘parallel wars’ syndrome. Separation of vital command elements, particularly the Tactical Air Command Post and the Land HQ, inability of tasking agencies to react quickly, administrative requirements shoudering out tactical requests, lack of direct authority and liaison, remoteness from the user and ‘too much bureaucratic processing . . . for air support’ are all conditions of ruinful familiarity.

c. Large Areas of Operation and Aircraft performance. Air assets either were not based close enough to troops or did not have ‘adequate range/payload’ for ‘widespread land operations’ typical of defence activities in Australia’s north. The further the range, the poorer the support, particularly as ‘multi-role aircraft (had) a primary role of air defence’ and were not, therefore, available for the land battle. This was hampered further by lack of close airfields capable of handling jet aircraft.

A counterpoint was that Army Pilatus Porter aircraft, acting in Close Air Support of infantry, were quicker and more effective in response, and ‘filled the gap in support’ between ‘friendly gun range (and) FGA support.’ The only dissenting opinion to this litany of dysfunction was the RAAF Commander Air West who felt that although ‘joint agencies . . . have little understanding of the organisation and use of air assets,’ he considered, ‘very few problems were encountered with doctrines and procedures.’

Every principle of successful Close Air Support had been broken. Rather than smoothly moving into the unity of operations that conduct effectiveness, it seems RAAF assets and command structures are consistently out of synchronisation with the rest of the ADF, and only come into line with much time and extemporising. Three years would seem sufficient for these lessons to be digested and implemented even without the example of history and experience from Milne Bay to Long Tan, but in Exercise Kangaroo 86.

‘it is questionable whether the complete RAAF Tactical Air Support Force (TASF) would ever deploy (as) stated in the Joint Supporting Plan (and) is hard pressed providing tactical air . . . gunship support for one brigade . . . over large AOs. (There is) need for TASF to be placed under operational control (at the very least) of the Brigade, and for the headquarters of both the TASF and Brigade to be collocated and interfaced.’

Hence, an incontrovertible pattern has now emerged to show where RAAF priorities lie if it takes the field. It is a linear progression of the ‘parallel wars’ characteristic exemplified in RAAF operations in Malaya and Vietnam, a final assertion of the centralist role conception.
as the dominant influence in RAAF organisational behaviour. Close Air Support to surface forces had become marginal to how the RAAF conceives its prime contribution to the defence of Australia.

Two major documents illuminate RAAF doctrine and regard for Close Air Support. They are the Air Power Manual, the official expression, and ‘The Leading Edge’, an approved exposition of corporate dispositions within the RAAF. Both are the refined and major enunciation of RAAF thought over the last twenty years, or more, on how it will transact its assignment as part of the ADF and in the defence of Australia. Both are especially authorised by the office of the CAS. Therefore, examination of how they approach Close Air Support in the land battle must be taken as a true projection of performance by the RAAF in any operation against incursion onto Australian territory. Both documents, as has been stated, are in the mould of the classic treatises on Air Power, particularly Douhet. The two are sprinkled with statements that are virtual rephrasing of Douhet’s terms; surprisingly they reflect virtually none of the emerging theory of the Air-Land Battle, which was the philosophical underpinning of coalition success in the Gulf War. The two works project the well ventilated airman’s conceit that ‘understanding air power is difficult’ and requires ‘years of training’. Why it is more so than the different but equally demanding training and knowledge required for an understanding of land and maritime power is not explained. Both contain complacent and self-serving interpretation of military history, markedly on the effectiveness of the Luftwaffe and, curiously, on the thoughts of Field Marshal Montgomery. The victor of El Alamein, an unrepentant infantryman and superlative virtuoso of the grande melee, is presented in both works as a kind of latter day apostle of Air Power. This wishful construction seems to rely on an over precise selection of his early tracts taken in isolated context. Later examination of his mature thoughts on War are justified in this paper as a consequence.

Both these official RAAF publications finally state, in the clearest terms, the centralist concept of air asset command, preferring isolation of RAAF assets to conserve them for concentration in the Control of the Air campaign. This, in unequivocal terms, is the raison d’etre of the RAAF. Control of the Air will be focused on the ocean approaches to the north; the ‘critical air-sea gap’. If the air maritime battle of the northern air-sea gap is lost, only then does the land battle on Australian territory have any relevance, and only to the Australian Army for ‘land oriented combat air support roles would not be the primary strategic emphasis in allocating RAAF effort in the defence of sovereign Australia.’ In other words, the Land Commander and his forces must fend for themselves. In the ‘Air Power Manual’ words are not minced in this regard, nor is there room for misunderstanding on this vital point.

‘If and when Control of the Air is achieved, then other priorities can be considered. The next priority is Air Bombardment . . . The next priority is the Navy and the Army . . . the first preference is to support maritime air operations . . . Close Air Support . . . may have low priority in future operations.’

The Army’s main role in this postulation is to provide security for RAAF ground bases under, not surprisingly, ‘at least operational control (of) the RAAF Base Commander.’ In case the point may be missed on ‘Control of the Air — the prime campaign’, it is mentioned at least four times throughout the publication.

The Air Power Manual devotes about twenty percent of its space to Combat Air Support by comparison to that for the Control of the Air and Air Bombardment campaigns; ‘The Leading Edge’ mentioned Close Air Support once, and then not in its section on RAAF ‘Roles and Missions’. In the most transparent of declarations, RAAF energies and thought are focussed on winning a titanic ‘Battle of Britain’ type conflict over the Timor Sea where costly platforms, based forward on substantial jet airfields, controlled at the highest level, fight an enemy making for Australia’s shores. However, if this enemy lodges on those shores

‘Air Superiority can only be maintained by withdrawing air power from the immediate battle to ensure that it remains to fight again.’

This tactic of reversed concentration, where air power is ‘withheld completely’ and ‘space . . . traded for time,’ is unofficially titled the ‘Cunctator’ method. As Air Power assets are the most valuable in Australia’s defence, other services of the ADF must operate to protect them so they can be withdrawn for deployment by Air Power experts of the RAAF, according to RAAF doctrine. This process, the timing of activity and where those assets will be directed, is so crucial to Australia’s defence, and so hard to perceive by any other than Air Power experts, that it becomes the sole province of the Air Power advisors to the CDF, the only person sufficiently senior to authorise their precious utilisation. Certainly not by lower level surface commanders unable, and not trained, to discern the subtleties of Air Power application. These ‘Cunctated’ air assets remain available for the surgical strike which will, at the carefully chosen moment, render an aggressor innocuous. The ultimate efficacy of this doctrine can only be tested in war but the words of Sun Tze may be germane.

‘Thus while we have heard of blundering swiftness in war, we have not yet seen a clever operation that was prolonged.’
It has been shown that the doctrinal debate, and its resolution, have strong similarities with similar debate with northern hemisphere Air Power theories and practitioners before World War II. This resulted in only the Luftwaffe developing techniques that, from the outset, were effective in the decisive land battles that commenced that war. Such divergence of doctrinal viewpoints, between air and surface power theorists, is a trait of interservice dynamics since aircraft were used as weapons. It characterises the air arm attempt to assert independence from those more traditional services, whose procedures and methods are a distillation of centuries of hard won experience, and gives rise, not unnaturally, to a ‘chronic impatience with history’.

Air Power theories are invariably predicated on the capabilities of aircraft and their weapon systems, either current or imminently available, usually in a circular loop of logic that shines a spotlight on the major equipment and develops a particular set of operational dictums that fit the equipment capabilities. A consistent outcome of such dialectics is an increasing focus on the ‘strategic offensive. Other considerations become ... servants of the air offensive.’ This process is one that has occurred frequently, certainly after the World War II in the United States as its newly independent USAF strenuously sought legitimacy in its own right. That the RAAF is proceeding along similar deductive furrows, from experience of other countries’ air arms, should not be seen as remarkable but merely a manifestation of air force intolerance for the intricacies of the land battle. The process though, as it has now within the ADF, can lead ultimately to a situation where the ground forces have little effective access to air assets for Close Air Support. Against even a modestly sophisticated enemy, this crucial deficiency may produce a defence force unable to win ground battles. It can be argued that this is the situation now applying to the

A useful postscript is a brief perusal of Close Air Support in the Gulf War. Although responding to Iraqi annexation of Kuwait, the tactical imperative, where the Coalition forces were required to dislodge forces in place through incursion into Kuwait, placed the armed forces of Iraq in an analogous position to the ADF, if one puts aside ideology. Coalition forces, where United States tactical thought was predominant, primarily followed the emerging ‘AirLand Battle’ doctrine of the US Army which is based on dispersed concentration of forces that will ‘move ... rapidly on multiple routes to mass quickly.’ It recognises total unity of combat elements where ‘combined arms teams work together ... to dominate the enemy at the tactical level’ and the Clausewitzian precept to ‘focus primarily on his forces.’ Rather than centralise command, subordinate commanders (are given) more authority and ... take more risks’ in ‘gaining positional advantage over the enemy and fight short, violent battles to force the decision’. Such doctrine embraces all the strategic elements of Air Power theory but avoids the ‘parallel wars’ divergence already discussed. It may be a more fitting basis for ADF doctrinal development, given its proven effectiveness. The RAAF, given the most probable low level incursion threat, also seems to pointedly ignore ‘small war’ theorists, notably Mao Zedong. It is more likely that forces making incursions into Australia will have Mao’s tenets, or one of his contemporaries, on what was once described as ‘Insurgency Warfare’, even if only implicitly, as their guiding principles. Considering the success of the People’s Liberation Army against the Kuomintang forces, and of the Vietminh/ Vietcong, without even vestigial air power, the omission is perhaps understandable but not empirically rigorous. RAAF writers of doctrine could find little comfort in a general who writes

“Our army at the time had neither planes nor tanks (yet still) learned a complete set of tactics for taking strong fortifications.”

Whilst in the Gulf War the air campaign was finally a success for Coalition air forces, the part played by the tactical disposition of the Iraqi Air Force greatly enhanced this result. Coalition air planners, with the example of North Vietnam’s air defence activities against the United States, expected stiff opposition and similar attrition, given the Iraqi Soviet installed Integrated Air Defence System, an upgraded version of that used by North Vietnam. Coalition superiority in Air Control and Multi-role fighters was only 2:1, much less a margin than needed to guarantee superiority, particularly against a combat experienced force such as the Iraq Air Force. However, two weeks after the start of the Coalition air offensive, the Iraqi Air Force had withdrawn most of its assets to Iran after token aerial combat with the forces making the incursion. The bulk of Iraq’s air control assets withdrew in this manner, leaving the Coalition free to direct its air forces to interdiction and isolation of the Iraqi Army. The feared losses to ground force anti-aircraft missiles failed to materialise in the scale expected, and the Iraqi ground forces, particularly the battle hardened Republican Guard, were helpless against Coalition air. In RAAF parlance, the Iraq Air Force had performed the ‘Cunctator’ tactic at the first inkling that their assets were in danger.” This is, perhaps, the first time that the withdrawal of valuable air assets from the initial ‘short, violent battle’ in the form of the ‘Cunctator’ tactic has been tested operationally. It may be that the ultimate fate of Iraq’s ground forces, defeated in less than ten days after the start of the land offensive, will not be
shared by the Australian Army facing an incursion force on the Australian mainland if the RAAF follows similar tactics to the Iraq Air Force. But on the only available recent evidence, it would be best to ensure that the ground forces of the ADF have the means to avoid that possibility."

The Tactical Air Support Group

This section is intentionally short. Up to now, the article has dealt with principles and the inferences drawn from historical and operational observation. To continue to confine discussion on that level means that only sparse practical suggestions should be offered. It is the intention of this article to stimulate debate and the substantiation of the outlines following should properly be the province of professional officers of the two surface arms.

Accepting that the Close Air Support gap exists, what are relevant factors affecting its solution and what is a possible shape of the practical application of possible solutions. RAAF doctrine is built around:

a. Fixed Base dependence.

b. Emphasis on the Sea Air Gap and the consequent irrelevance of the land battle.

c. Absolute primacy of the Control of the Air Campaign and the Air Offensive (the Strategic Role Conception).

d. Procurement of costly platforms suited to the Strategic Role.

e. Conservation of those costly platforms.

f. Command of those platforms at the highest level and control only by RAAF officers.

The gap, as has been said, is between the FA/18 and the field howitzer. The TASF is unlikely, on exercise performance, ever to fulfill its function which, in any case, will be unquestionably subordinated to the Control of the Air campaign. A new Tactical Air Support Group is required to fill this gap.

It is unlikely that much, if any, warning will be received of a determined and well planned incursion by an enemy onto the Australian mainland. The probability is that a low-level lodgment will be detected only after it is on the ground. Penetration by fishing and refugee vessels is almost a weekly commonplace in Australia’s northern approaches and to properly monitor them would require more resources than currently available or planned. If all surveillance resources were utilised "positive identification rates would be ... 5-20 per cent per crossing of the sea-air gap." A wisely positioned lodging would preclude effective air strikes due to range limitations from the nine airfields capable of unrestricted RAAF operation in northern Australia. Moreover, there are almost three hundred airstrips in the same area that can support C130 Hercules aircraft and any one could become the lodgment point for a determined enemy. In such a situation ‘Australia’s very advanced strike forces ... are unlikely to be appropriate.’

The Australian Army, left to mount a response to such a threat, would require certain characteristics of the TASG supporting it. There would seem to be several, fairly clear ones from the preceding discussion. The TASG should be:

a. Equipped with relatively cheap, rugged platforms that are easily replaced and maintained, with a useable payload, range and loiter times, and that can operate from the numerous C130 class airstrips in Northern Australia.

b. Deployable in small elements of a size appropriate to the ground force deployed and capable of locating with, or very close to, the supported force.

c. Commanded by a surface force officer, either navy or army, reporting directly to the ground force commander. The assets are coordinated by the ground force Fire Support Control Centre and can be requested by Fire Support Specialists with the combat elements.

d. Part of a joint surface force group exclusively committed to the development and training of assets for Close Air Support, particularly ground forces in the early stages.

Without going further into organisation structure, these characteristics would seem to be the guidelines that fill the Close Air Support gap and conform to the time tested principles for effectiveness in this role.

There are two concrete suggestions on the characteristics mentioned above. They are:

a. Fostering. The group and its development should be jointly fostered by the Australian Army’s Aviation Corps and the appropriate sections of the Royal Australian Navy’s Fleet Air Arm. Command should be rotated in turn between these two surface elements and operational units commanded by officers from these two services.

b. Equipment. Fleet Air Arm Skyhawks are more than adequate, although not capable of operating from C130 fields. Army Aviation Iroquois or Blackhawk helicopters, modified for the gunship role would be the first step for ground forces. Indeed, Australian Blackhawks have strengthened cargo floors to enable the operation of multiple barrel weapons. As purely a stop gap, however, the GAF Nomad could be modified for the Close Air Support role, in spite of its shortcomings. This
would cover the existing deficiency until more technically proficient aircraft could be acquired, probably through the 'Armed Reconnaissance Helicopter' programme for Army Aviation. For instance, a suitable and well-proven type is the Cobra (the AH-1W model) that is readily and cheaply available. Design and manufacture of an aircraft similar to the Argentinian Pucera may also have value. A quota of two per regular Army battalion would seem a reasonable starting point, with a fifty per cent reserve.

This article has, it is hoped, laid the basis for examination of what is a serious deficiency in the capacity of the ADF to perform its function in the defence of Australia — particularly the capacity of the ground forces to prevail in the land battle. Examination of major themes in the history of Close Air Support and its evolution in the Australian context, may provide underpinning for future and more specific professional debate on the provision of necessary air assets to the surface commanders of the ADF.

A last word will be left to Field Marshal Montgomery. In his final magnum opus, 'A History of Warfare', the old commander made the ultimate expression of his long career on the subject of war. Montgomery certainly ascribed Air Power as having a 'profound impact', but no more so than Sea Power where the lesson was that the nation that 'had control of the seas, has in the end, prevailed.' He saw that the modern commander should use both to constrain the enemy to a land conflict, where a decisive battle can be fought. In fact, he ascribed the greatest significance for military success to a factor not reliant on technology at all; Morale, 'the most important single factor in war.' But on the subject of who determines the all important land battle, after all the foundation of this article, he was in no doubt

'... In spite of the magnificent part played in battle by aircraft, artillery and tanks, to my mind in modern war it is the infantry soldier who in the end plays the decisive part in the land battle ... I believe it to be true ... the most versatile of all arms; it can operate in any weather, in any type of ground ... day or night ... he has to bear the main burden in battle.'

It is hoped this article will help in the lightening of that burden and assist the Infantry of the Australian Army to have the means to do their indispensable job.

NOTES
i. This is vastly different to the para-professional bias of current RAAF training, where technical and process proficiency has come to mask any depth or rigour of theoretical understanding of the conduct of War. Interestingly, neither of the authors of 'The Leading Edge', despite their seniority, have active service. The Distinguished Flying Cross awarded to one was for services to training.
ii. It was the awareness of this employment of Air Power that Montgomery referred to when he identified Air as a significant development in warfare, and not as a separate, disjointed service pursuing its own vision of operations remote from the only decisive activity in war, the land battle. He had little confidence in the higher direction of the Allied Air Forces before D Day in 1944 as 'the air forces simply failed to see what practical help they could give the Army.' Lord Alanbrooke describes Air Marshal Harris telling the 'Overlord' briefing how the RAF 'might have won the war if it had not been for the handicap imposed by the existence of the other two services.' (6. pp.582 & 599.)
iii. Morehead describes the unity of the 'steady rhythm of the German attack — first the Stukas, then the artillery, then the infantry, then the tanks, then the Stukas following up again.'
iv. Compare Douhet's 'Command of the air means victory' and 'vital centres' with 'Air Power is the key to Australia's defence'. Air Power ... able to provide victory on its own account' and 'centres of gravity' and 'vital elements'.
v. Latin: Delayer — after Quintus Fabius Maximus, the Roman general who artfully avoided combat for several years with Hannibal's Carthaginian forces after they had lodged an incursion on the Italian mainland.
vi. In the Gulf War, of the 1305 combat aircraft fielded by the Coalition air forces, excluding rotary wing, the percentage of specialist Close Air Support aircraft was just over fifteen per cent, not an inordinate diversion of Air Control and Bombardment resources. The US Army/USAF 'Joint Attack Team' concept employing A10 aircraft and AH64 Apache helicopters was tested successfully, the Apaches being used to clear a safe corridor for strike aircraft into Iraq.

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3. 2. p.113; 7. p.54. ... Australia's very advanced strike forces ... are unlikely to be appropriate (in) coping with the low level contingencies. p.105. ... F-111 and F/A 18 ... are twice as expensive to operate as the older Mirages ... 29, p.203.
4. 15. 'The chief of the Air Staff ... proposed that the Officers undertake research into ... air power doctrine ... for Australia's needs', and statement to D.J. Dennis by Wing Commander P.J. Criss on 8 October, 1990: 'The Terms of Reference were given by the Chief of the Air Staff for the book.'
5. 15. p.104.
6. 17. p.93.
8. 17. p.7; 15. 'Roles and Missions', pp.84-85: No mention is made of either 'Close Air' or 'Battlefield' support for ADF air power assets. 'Force Structure: an Air Force View', Air Commodore N. Ashworth, APDR, September, 1990.
9. 17. pp.4-5.
10. 18. p.165; 15. p.187, 'Air power is the key to Australia's defence ...' and p.166 '... doctrine must clearly establish priorities ... which will enable the RAAF to be employed in a manner which will permit optimum force projection ...'
11. 5. p.16, and 15. pp.103-104, quoting the CAS, '... our air crew (will) stand outside the range of an opponent's defences as they send in multiple, difficult to detect, very accurate
weapons against targets of real importance to his war effort.' (The tone of this statement echoes that of the American general in 1938.) Also, p.160, '... the predominant role air power should play in the defense of the nation into the foreseeable future'; 29, p.32.

12. 5, p.16.
13. 16, pp.150-151.
14. 17, p.5.
15. 18, pp.9-12, pp.53-55.
16. 9.
18. 19, p.378.
19. 18, pp.154-159; 10, pp.1460-1463.
20. 18, p.11.
22. 18, pp.15-18, p.31.
23. 19, pp.316, 346.
24. 6, pp.173, 600; 8, p.525. ('... in the end all wars become a confrontation between infantry — and the training of this infantry, its ability to move with cohesion, and to cooperate with artillery, tanks, engineers and aircraft, would determine the outcome.')
25. 22, p.33.
26. 6, p.599.
27. 6, p.285.
28. 6, pp.599-600.
29. 6, p.661; 8, p.525.
30. 6, p.588.
31. 4.
32. 21, pp.603, 611.
33. 21, p.617.
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36. 23, pp.32, 158-160.
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39. 14, pp.781-783; 27, pp.81, 126.
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43. 25; a, par. 54, 105; c, par. 54, 153; a, par. 35, 40, 105; b, par. 102, 153; c, par. 17, 18, 93, e, par. 3313-3315. An example of reciprocal understanding of land operations by RAAF Comd Air West, and one that is typical of the cursory knowledge of ground operations held by RAAF flyers of the present generation, is contained in his report when he suggests 'try some air/ground tactics ... for example, surrounding a suspected enemy concentration, attacking with aim to destroy, confuse or frighten, then move in or wait to catch them as they move out ...'. The writer wonders who would end up being confused and frightened!
44. 26, par. 1-4, 27.
45. 13, pp.31-33, 37, 41, 50, 85, 90, 98-99, 124, 166, 175-177, 187, 201, 233; 15, pp.33, 73, 104, 144, 136, 163.
46. 17, p.17; 27, pp.7-9, 19.
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Military professionals and strategic scholars tend to specialise in their knowledge of combat power. In general, they will have a highly detailed understanding of one school of strategic thought and a working knowledge of the other two. That does not mean that continental, maritime or aerospace strategies are mutually exclusive. On the contrary, few commentators would dispute the suggestion that the joint application of those strategies almost certainly will be a prerequisite for victory in modern warfare.

A rigorously developed national defence strategy will have considered the relative strengths and weaknesses of land, sea and air power before arriving at its final form. Almost certainly, that end result will be a comprehensive, joint strategy. The strategy of 'defence in depth' endorsed by the Australian Government in 1987, and which incorporates 'classical' elements from each of the schools of strategic thought, is one example.

Notwithstanding the pre-eminence of joint thinking, it is essential to appreciate that joint warfare capabilities rest squarely on single Service expertise. Navies, armies and air forces have few more important tasks than continually to review and, if necessary, redefine their fundamental beliefs.

In that respect, the air school of strategic thought has not always been well served. Some of the more prominent early air power theorists made exaggerated claims; while many air force leaders have focused on the machine and its weapons rather than the concepts that underlie their use — they have been technocrats rather than strategists. Here, the domination of air forces by pilots has been a major factor. There seems to have been a belief that the ability to fly an aeroplane brings with it an automatic understanding of air power in its widest sense. Clearly, that has not been the case.

The RAAF, for example, existed as an independent service for 70 years before its leaders finally codified and formalised Australian air power doctrine. There is no doubt that the absence of a clearly articulated air strategy impaired the RAAF's application of air power on occasions during those seven decades.

Before examining air strategy, an understanding of the nature of air power is necessary. There are two widely used definitions. The first sees air power strictly as a sub-set of combat power by defining it as 'the ability to project military force by or from a platform in the third dimension above the surface of the earth'. It is important to note that air power uses the third dimension not merely as a medium for transit (as does a bullet or missile), but for manoeuvre, deployment, concealment and surprise. The second definition comes from General H.H. 'Hap' Arnold, the commanding general of the United States Army Air Force (USAAF) during World War II. General Arnold described air power as the capacity to 'deliver cargo, people, destructive missiles and war making potential through the air to a desired destination to accomplish a desired purpose'. It was a capacity derived not just from the war-making components of aviation, but from a nation's total aviation activity, 'potential as well as existing'. In combination, the two definitions provide a good description of the special qualities of air power.

Implicit in those definitions are the strengths and weaknesses of air power. Perhaps the most widely recognised strength of air power is flexibility. Air assets can be quickly diverted from one task to another and from one target to another. Advanced technology makes it possible for a weapons system like an F-111C to be diverted in-flight from, say, a close air support task to strategic land strike, perhaps on a different continent. Other advantages include versatility,
swiftness of application, pervasiveness, reach, shock effect, the ability rapidly to concentrate force, and high relative military effect (that is, the large amount of combat power which can be applied by very small numbers of combatants).

Those strengths inevitably come at a cost. It would be fair to say that some air strategists have allowed the manifest attractions of their discipline to blind them to its shortcomings. The air weapon is very expensive to acquire and operate and requires high quality in all support functions. Unless nuclear, chemical or biological weapons are used, only sustained operations supported by a major logistics effort are likely to give the effects of air power any permanence. An aircraft is vulnerable in the air but much more so on the ground, where the complexities and expense of permanent dispersal almost invariably mean that aircraft and their support facilities are concentrated on a fixed base. As a high value target, the fixed base is air power’s centre of gravity. The ease and rapidity with which air power can be either committed to, or withdrawn from, action makes it an attractive option when short-term political effects — rather than strict military ends — are sought. (It is, of course, a fact of life that any form of combat power can only be applied in accordance with the prevailing political ethos.)

Those general characteristics of air power underpin aerospace strategy. The way in which they have been developed into a broadly accepted strategic concept is best demonstrated by tracing the history of ideas in air warfare.

**World War I**

It took the Royal Australian Air Force almost 70 years formally to articulate and publish its central beliefs. When in 1990, the RAAF finally produced the first Australian manual of air power doctrine, three major, distinct air activities, called campaigns were identified. These were Control of the Air, Air Strike, and Air Support for Combat Forces. The purpose of each of those campaigns is self-evident, but two points must be made. First, control of the air is the prime air campaign. No major offensive has succeeded against an opponent who controlled the air, and no defence has sustained itself against an enemy who had air superiority. As General Montgomery concluded in 1943, ‘you must win the air battle before you embark on the land, or sea, battle’. Second, air strategy is centred on the three campaigns. If the campaigns are conducted concurrently, a general air strategy is being applied; if only one or two of the campaigns is conducted, it is a limited air strategy. The emphasis an individual planner or theorist places on each of the campaigns is a key indicator of his place in the air school of strategic thought.

While it may have taken the RAAF 70 years to endorse those concepts in a consolidated, formal publication, there is no doubt that the basic ideas were understood from the earliest days of air warfare.

The first bomb dropped in anger is credited to an Italian pilot, a Lieutenant Rossi, in North Africa in 1912. Lieutenant Rossi subsequently wrote in a New York newspaper that, after dropping his bomb on a group of Arab horsemen ‘a thick cloud of dust [rose] from the ground, and men, horses and camels [scattered] in all directions’. It was, Lieutenant Rossi wrote, ‘a wonderful sight, the bomb had fulfilled our expectations’. The Arabs found it a less wonderful sight. They opened fire with their rifles and hit both the pilot and the aeroplane, thus giving Lieutenant Rossi a number of firsts on the one day.

Notwithstanding Lieutenant Rossi’s gallant exploits, aircraft were first used militarily as reconnaissance platforms, a role which remained the primary function of the RAAF from its formation in 1921 until World War II. In other words, the campaign of Air Support for Combat forces was the main raison d’être for air power. However, while reconnaissance may have been the prime formal responsibility of air forces, in the minds of airmen at least, other roles had assumed de facto priority well before the end of World War I.
Once the crews of reconnaissance aircraft started shooting at each other to try to prevent reconnaissance from being conducted, control of the air had, ipso facto, become a prerequisite for all air activities. Consequently, specialist fighter aircraft were rapidly developed. Once those fighters also started to use their enhanced attack capabilities to increasing effect against ground targets, another compelling reason to ipso shooting at each other to try to prevent reconnaissance structures, as fighter and attack aircraft began to enter air forces in increasing numbers.

The second major concept to emerge from World War I was that of offensive action, which corresponds to the campaign of Air Strike. Under the leadership of General Sir Hugh Trenchard, the Royal Flying Corps (RFC) became committed to the principal of an unrelenting offensive. According to Trenchard, it was the opinion of those most competent to judge that the aeroplane, as a weapon of attack, [could not be too highly estimated]. His brief instruction to the RFC of September 1916 entitled ‘Future Policy in the Air’ — impressive in its uncompromising attitude — remains the classic expression of offensive air operations.

The argument has been made that Trenchard’s attitude was little more than an RFC imitation of Sir Douglas Haig’s policy for the land war. As Commander-in-Chief of the British Forces in France, Haig subscribed to a ‘relentless and incessant’ offensive, and he and Trenchard ‘spoke as one’ on the matter of strategy. Thus, it has been argued, the emphasis on the air offensive was misplaced, with losses such as those at Arras in April 1917 testimony to Trenchard’s ‘stubborn stupidity’. That may or may not be true. As far as enduring doctrine is concerned, the origins of Trenchard’s directive and the reverses experienced at Arras are less significant than the focus the policy placed on the general importance of offensive action and air superiority. Like all military thought, those concepts require judgment in application.

There was indisputable, physical evidence of the changes in air strategy during World War I, even if some generals and admirals continued to insist that reconnaissance was the only legitimate role for an air force. The appearance of huge formations of aircraft massing to seek combat over the Western Front — the best known example being von Richthofen’s Flying Circus — were a practical expression of the need to concentrate force and take the initiative, that is, to prosecute offensive action in the struggle for control of the air and of the battlefield. Those formations were also an indication that air combat had become an end in itself.

The emphasis on the offensive was not restricted to air-to-air combat. Few events during World War I caused more panic and alarm than the attacks on London by German Gotha bombers in June and July 1917. As a direct consequence of those attacks, within three months the British Government had established what amounted to a strategic bombing force in France, known as the Independent Force, to conduct reprisal raids against the German homeland, and within a year the RAF had come into being as a separate service.

The establishment of the Independent Force did more than formalise the air strike campaign. It also implicitly acknowledged the radical theory that future wars might be won quickly and decisively — and, therefore, with minimum human and material loss — by air power alone. That theory rested on a powerful psychological base. In the first place, it was a reaction to the ghastly, moribund mess on the ground in France, where British Prime Minister Lloyd George was desperate for an alternative strategy which would liberate his forces from the dead hand of Haig. Second, the reports of the Gotha raids against London and the subsequent retaliation by the Independent Force against cities like Cologne starkly reveal the appeal of strategic bombing. In view of the manifest public panic and the seeming invulnerability of marauding fleets of bombers, the collapse of civilian morale and, therefore, the idea of a quick, decisive victory, seemed entirely plausible.

The concepts of control of the air and strategic strike were radical additions to theories of war fighting. The greatest strategic theorist, Carl von Clausewitz, had believed defence to be the stronger form of warfare. Clausewitz had, of course, been describing wars between armies, for whom historically defence had been easier to organise and conduct than offence. Clausewitz had also concluded that victory was achieved by defeating an enemy’s military forces in the field. 

Air power, however, had extended the battlefield. Total warfare could now be waged against an entire nation, with the objective being the destruction of national will rather than armies and navies. The air weapon threatened to turn traditional strategic thinking on its head. It was also plain that air strategy intrinsically contained a powerful political dimension.

If air bombardment was a controversial addition to strategic thought, there were few disagreements over the value of the third campaign, Air Support for Combat Forces. By the end of World War I almost every role performed by air power in the 1991 Gulf War had emerged, albeit in a sometimes rather primitive form. For armies, roles such as close air support, transport, reconnaissance, communications, interdiction, artillery spotting, resupply and rescue had made the aeroplane
an indispensable contributor to continental strategy. Many of those roles were repeated in support of maritime strategy, in addition to anti-submarine warfare, convoy escort, search and rescue, maritime strike and minefield survey.

It should be noted that air support for combat forces was also conducted to assist the other two air campaigns; and again, by the end of World War I the range of activities was impressive.

Numerous other concepts were developed during the Great War, but the three campaigns best illustrate the nature of air strategy. In the ensuing 75 years those concepts have not changed, even if the means of applying them have.

Between the Wars: The Classical Theories

Control of the air may have emerged, de facto, by 1918 as the prime air campaign, and air support for other combat forces may have been the campaign embraced by admirals and generals, but it was air bombardment which primarily occupied the minds of air strategists and statesmen during the interwar years.

If Trenchard had provided the practical demonstration of offensive air operations, the great Italian theorist, Giulio Douhet, provided the most compelling theoretical model in his classic work The Command of the Air, first published in 1921 but containing ideas which Douhet had been promoting for years. With his single-minded focus on air bombardment and his belief that victory could be won by air power alone, Douhet was a proponent of a limited air strategy.

Douhet’s central thesis was presented in his book under the portentous heading The Extreme Consequences. His position was unequivocal: ‘To conquer command of the air means victory; to be beaten in the air means defeat and acceptance of whatever terms the enemy may be pleased to impose’. He accordingly concluded that the air force was destined to become the dominant form of combat power, to the extent that it should be strengthened at the expense of the other services. Air power had introduced a ‘new character to war’, which emphasised the ‘advantages of the offensive’ and would make for ‘swift, crushing decisions on the battlefield’.

General Douhet took his argument even further in his definition of the ‘battlefield’. Because of the aircraft’s range, speed, relative invulnerability and unparalleled striking power, and its predicted ability to create fear and panic among the enemy’s population, it was logical, he stated, for aerial bombardment to be directed primarily at population centres and the national infrastructure. The destruction of ‘governing bodies, banks and other public services in a day’ would plunge an enemy into ‘terror and confusion’. Superiority over an enemy’s air force was likely to be a prerequisite for victory, and would be gained not by combat in the skies, but by destruction on the ground; that is, by again employing the inherent and decisive offensive capabilities of air power.

A ‘Battleplane’ which combined the characteristics of bomber and fighter aircraft was proposed as the means to those ends. Douhet’s concept of a Battleplane was one of the first proposals for a ‘general purpose’ or ‘multi-role’ aircraft, an idea which has been something of an article of faith for airmen ever since and which, like the belief in strategic strike, for many years never quite met the expectations of its advocates.

Douhet accompanied his thesis on aerial bombardment with considerable comment on other aspects of air warfare, including organisation, the moral aspects and material preparation. That he overstated his case and by doing so possibly harmed the credibility of the air weapon should not be allowed to diminish his status as a pre-eminent military thinker.

The historian Edward Warner has suggested that if Douhet wrote for the professional military audience, General William ‘Billy’ Mitchell addressed his convictions on air power primarily to the public. Unlike the more scholarly Italian, Mitchell was passionate and outspoken in his beliefs, particularly regarding the independence of air forces. Notwithstanding the
difference in temperament, he shared with Douhet an over-riding faith in the inevitable dominance of air power through offensive action. Key factors in that belief were Mitchell’s perception of the continually increasing technical superiority of the aircraft over other machines of war, and the fragility of civilian morale. In a moment of the first magnitude in the history of combat, Mitchell provided a dramatic demonstration of his theories by sinking the captured German dreadnought Ostfriesland with 2000 lb bombs during trials off Norfolk in 1921. From then on, surface ships operating without air cover had to be considered at risk.

Mitchell had been a combat pilot in World War I, but his projections for the future uses of air power were, like those of Douhet, excessively speculative. He thus overestimated the extent to which the aircraft would achieve technical dominance, and underestimated the capacity of the civilian population and industry to withstand the effects of strategic bombing. It is noteworthy that Mitchell, like Douhet, was court-martialed for criticizing prevailing land- and sea-oriented national defence strategies. Given the opprobrium area bombing subsequently attracted during World War II, it is also noteworthy that air strategists saw their weapon almost as a ‘civilising’ instrument. As Mitchell noted in 1930, “[bombardment] is a distinct move for the betterment of civilisation because wars will be decided quickly and not drag on for years ... It is quick way of deciding a war and really more humane’.

Notwithstanding the fact that the theories of the early air power strategists were based on limited evidence and an exaggerated belief in the technical capabilities of the air weapon, the perceived threat of offensive air power strongly influenced military planning and international relations during the inter-war years. In the United Kingdom and the United States, influential airmen promoted the idea of quick victory through decisive air attacks. Throughout Europe statesmen were haunted by the spectre of strategic bombardment by fleets of marauding bombers, against which it was thought defence would be powerless. The notorious claim that the bomber would always get through came not from an airman but a politician, British Prime Minister Stanley Baldwin, during a speech to the House of Commons in 1931. It was because of the disturbing offensive potential of air power that successive conferences on international law and disarmament throughout the 1920s and 1930s considered proposals as extreme as completely banning aerial bombing. The ‘horror’ bombing of Guernica by the Luftwaffe’s Condor Legion in April 1937 during the Spanish Civil War fuelled those attitudes. During the Munich crisis of 1938, fears of the Luftwaffe’s bombing capability saw trenches dug in London parks, while nearly one third of the population of Paris evacuated the city.

World War II

‘The master weapon of World War II’, the Royal Australian Navy stated in its Post-War Plan in 1945, ‘has been the aeroplane’. Notwithstanding the vicissitudes of the various strategic bombing offensives, there was no doubt that air power had been a decisive force. That force was applied through operations based on the three campaigns. In broad terms, the Allies followed a general strategy and the Axis powers a limited strategy, with the difference being the emphasis placed on the air strike campaign.

The war confirmed control of the air as the prime air campaign, with the best-known example being the RAF’s victory in the Battle of Britain, which averted the planned invasion of the United Kingdom. That battle, incidentally, is one of the few examples of a successful defensive control of the air (or counter air) campaign: in general, airmen would prefer to wage an offensive campaign, that is, to destroy an enemy’s air power on the ground rather than fight a war of attrition in the skies. It is noteworthy that the Germans had been on the verge of achieving an offensive counter air victory during the Battle of Britain when Goering
made his fateful decision to shift the focus of the Luftwaffe’s bombing attacks from the RAF’s Fighter Command to British cities and ports. Goering thus allowed the beleaguered Fighter Command to recover, re-group and eventually carry the day.

Two other occurrences provide a good illustration of the importance of control of the air. The first was the introduction into service in December 1943 of the long range P-51 Mustang fighter, which was able to accompany USAAF strategic bombers deep into Germany. Prior to the arrival of the Mustang, the unprotected USAAF daylight bomber force had often suffered heavy losses. The P-51, however, was able to establish local air superiority around bomber formations, thus greatly reducing their loss rate. As Noble Frankland concluded, the introduction of the Mustang ‘changed the course of the war in the air’. The second occurrence relates to the preparations for the Normandy invasion of 6 June 1944. General Eisenhower’s Deputy Supreme Commander, Air Chief Marshal Sir Arthur Tedder, believed the most important contribution air power could make to the invasion would be to disrupt the transport system in France. Because Fighter Command had established air superiority over France, Allied bombers were able to achieve Tedder’s aim relatively free from attack. Basil Liddell Hart later concluded that Tedder’s paralysis of the Nazi’s communications system was the single most significant factor in the success of the Normandy invasion. It was the control of the air, though, that underwrote Tedder’s success.

The war also confirmed the importance of the campaign of air support for combat forces. In the land battle, perhaps the best known example was the now-classic combination of armour, highly mobile infantry and aircraft in the blitzkrieg attack. While blitzkrieg is generally associated with the German Army, the technique was used with equal effect by others. Examples include Air Vice-Marshal Coningham’s Desert Air Force and General Montgomery’s Eighth Army in North Africa; and, on the Russian Front, the Soviet Army in combination with the remarkable Ilyushin II-2 Sturmovik ground attack aircraft, which was described by Stalin as being ‘as essential to the Red Army as air and bread’.

At sea, Billy Mitchell’s demonstration from 1921 was quickly given operational expression by a number of actions, with perhaps the most dramatic being the sinking of HMS Prince of Wales and Repulse by Japanese aircraft only three days after Pearl Harbor. Six months later, at the Battle of the Coral Sea, a major air/sea battle was fought for the first time in history without surface ships ever coming within sight of each other. Nor did they exchange fire, as all offensive action was carried out by aircraft at distances in excess of 100 miles from their carriers. Air support had become integral to maritime operations. Throughout the war naval and air units worked together in a wide range of tasks, including anti-submarine warfare, convoy escort, maritime strike, minelaying, reconnaissance, air defence, fleet protection and communications.

The air strike campaign was the most contentious air power issue from World War II. There is no doubt that the campaign had its problems. Equally, there is no doubt that the Strategic Bombing Offensive eventually played a decisive part in the Allies’ victory. According to the Nazi’s Minister of War Production, Albert Speer, if attacks of the scale of those made against Hamburg in the week of 25 July to 2 August 1943 had been repeated against six more major cities, Germany’s armaments would have been brought to a ‘total halt’. The United States Strategic Bombing Survey concluded in September 1945 that Allied air power had been ‘decisive in the war in Western Europe ... It brought the [German] economy ... to virtual collapse’. It is sometimes forgotten that Japan — one of the war’s major belligerents — surrendered unconditionally with its armies intact before a single Allied soldier had set foot on the Japanese Home Islands. Japan’s capitulation is sometimes linked solely to the atomic attacks against Hiroshima and Nagasaki. The harsh fact was, however, that the use of the atomic weapons was just the conclusion of a devastating bombing campaign during which many more people were killed by ‘fire bombing’ raids conducted with conventional weapons.

As was noted, the Allies conducted a general air strategy. The extent to which they were able to prosecute each campaign simultaneously inevitably depended on the state of the war, resources and the priorities of different theatres. For example, early in 1944 the Commander-in-Chief of Bomber Command, Air Marshal Sir Arthur Harris, objected when his aircraft and crews were temporarily diverted from the air strike campaign onto the air support for combat forces campaign. At the time, Allied Supreme Command believed Harris’s bombers would be better employed attacking transport facilities in France in preparation for the Normandy invasion, rather than pursuing the strategic offensive against the German homeland. For most of the war, however, the Allies were able to sustain a general strategy.

By contrast, both Germany and Japan adopted a limited air strategy, with the Luftwaffe structured largely to support the German Army and Japanese air power the Navy. Neither country ever developed a powerful, independent strategic bombing force comparable to that of the RAF or the USAF. The Germans in particular never acquired a genuine strategic bomber, a
deficiency which became a major factor in their inability to prosecute the war to maximum effect.41

Before concluding the discussion on World War II, the two critical air power concepts of ‘independence’ and ‘unity of command’ must be mentioned. During the inter-war period the question of whether air forces should be independent from direct army and/or navy command was regularly debated. The experience of World War II indicated that, on the grounds of professional expertise and organisational effectiveness, the concepts were fundamental to the successful application of air power.

The connection between independence and professionalism was clear enough. Just as the complexities of land and sea warfare demanded the services of experts, so too did air warfare. Experience showed that the necessary degree of expertise was most likely to be achieved in an organisation which was fully committed to specialised training and the complete range of operations in air power’s unique environment.

The case for ‘unity of command’ rested on the need to exploit fully that most valuable characteristics of air power, flexibility. Allocating scarce resources (aircraft) to individual users is a wasteful practice. The Allies quickly found that the flexibility of air power was best exploited by placing all assets under one commander, who could respond to demands for support in accordance with priorities determined by the theatre commander.44 The successful application of the maxims of independence and unity was evident at the operational level of war through the partnerships between Montgomery and Coningham in North Africa, MacArthur and Kenney in the Southwest Pacific, and Bradley and Quesada in Europe.

The Great Deterrent

The two atomic attacks on Japan were the ultimate expression of Douhet’s theory of victory through air power. They also provided the foundation of the strategy of nuclear deterrence, which has since dominated global security planning. While that development may have indicated a pre-eminent place in military thinking for air strategy, it also raised a major intellectual challenge. It was a challenge air strategists initially did not address fully.45

The advent of nuclear weapons seemed fundamentally to have changed the nature of war. In a now-famous passage, Bernard Brodie redefined global conflict in 1946 when he wrote: ‘Thus far the chief purpose of our military establishment has been to win wars. From now on its chief purpose must be to overt them. It can have almost no other useful purpose’.46 Against that background, by early 1950 the United States Joint Chiefs of Staff had agreed that deterrence through strategic bombing was the primary mission of the USAF, and the first priority of joint defence was the ‘ability to deliver the atomic bomb’.47 That outlook was pure Douhet. Because of the Joint Chiefs’ decision, the USAF’s Strategic Air Command enjoyed pre-eminent status and budget priority at the expense of the other Services and USAF commands.48 Yet the endorsement of nuclear deterrence as the prime air power campaign brought with it a number of intellectual complications which perhaps were not widely appreciated at the time.

First, the primary role of Western air power at the global level was now to avert wars, not win them. That clearly required a radical change of outlook within air forces, and carried radical implications for force structures, training and attitudes. Second, control of the air apparently was no longer acknowledged as the prime campaign. That too was a change with significant implications. Finally, there was a danger that other air power roles and the continuing review and development of ideas associated with those roles might become neglected in the face of the apparently overwhelming force of the nuclear bomber.
One influential strategist who recognised those potential difficulties was Marshal of the RAF Sir John Slessor, Chief of the Air Staff in the UK from 1950 to 1952. Slessor appreciated that in its fullest sense air power had become an unlimited instrument of war. The paradox for air strategists therefore was that, having achieved the dominance predicted by Douhet, the appalling consequences of exploiting that dominance made it untenable for other than irrational nations. As Slessor noted, because of strategic (nuclear) air power, 'total war [had] abolished itself'. Thus, large air forces like those of the US, the UK and the USSR were pouring resources into a capability which had unlimited war fighting power, yet which could be used only within the most limited air strategy. Nevertheless, Slessor concluded, it was essential to retain the 'Great Deterrent' in the interests of world peace. Should the unthinkable happen and global nuclear war occur, then air power alone would decide the outcome. In that specific, very narrow context, air strategy had been reduced to the most straightforward formula.

The Great Deterrent consequently could not be allowed to overshadow the fuller employment of air power; it was still necessary to develop air strategies and capabilities suitable for limited war. Here, Slessor made two important points. First, it was probable that in any limited conflict air power would not be really effective until armies were fighting. As David MacIsaac has also noted, for air interdiction to be effective, friendly surface forces have to control the tactical initiative. Aircraft operating by themselves can harass the enemy but cannot carry the day alone. In other words, contrary to both Douhet's thesis and the assumed course of global war, in a limited war the bomber would not be the sole means of victory. Slessor did, however, suggest that once armies had joined battle in a limited war, the air striking forces could 'make it impossible for the most highly organised and disciplined army to offer prolonged resistance to a determined offensive on the ground'. His second point therefore followed on from the first: namely, that the bomber would remain the primary agent of 'air mastery'. It also followed that if air power were to be applied successfully in limited wars, a general strategy — that is, one including each of the three campaigns — would probably be required.

In the event, Western air power experienced serious problems in the first two major conflicts after World War II, in Korea and Vietnam. Largely because of the priority given to Strategic Air Command, other USAF commands had suffered from a relative lack of technical innovation and research and development since 1945. The status and support given to Tactical Air Command in particular had been substantially reduced. Not surprisingly, serious doctrinal and operational shortcomings soon became apparent in Korea. In the space of five years, some of the fundamental lessons of World War II had been forgotten. American pilots and planners had to relern the art of providing close support for ground forces. Further, major difficulties were experienced with the massive air interdiction campaign, which failed to take into account the nature of the enemy. Allied air planners never really came to grips with the fact that it was enormously more difficult to interdict a supply system based on peasant labour than mechanised transport.

The real issue for air strategy from Korea, though, was the imposition of political controls on United Nations' bomber aircraft. Grand notions of victory through air power alone meant little if airmen were prevented from using the full force at their disposal. That was the case in Korea, where political considerations and the problem of target discrimination combined to do up the use of nuclear weapons and inhibit the choice of targets for conventional bombing. The simplistic formula of the Great Deterrent was inadequate for the complexities of limited war. The complaints of leading airmen like General Curtis LeMay that air power was unreasonably constrained in Korea showed a disappointing lack of understanding of the political dimension of strategy. That dimension, incidentally, had been well-understood by some of the early air power scholars, Australia's Air Vice-Marshal H.N. Wrigley, for example, in commenting on the singular offensive potential of the air weapon, had cautioned against the 'precipitate use of the air force' some 25 years previously. A vicious war on the Korean Peninsula was bad enough: no-one wanted it to escalate into World War III through the peremptory use of excessive force.

Political imperatives also influenced the use of offensive air power in North Vietnam some 15 years later. During the bombing of North Vietnam from 1965 to 1968, codenamed Operation Rolling Thunder, an extraordinary degree of control was exercised over the tempo of bombing and the selection of targets by US President Lyndon Johnson and Secretary of Defence, Robert McNamara. According to USAF General J.W. Vogt, Johnson and McNamara selected targets using the doctrinally distorted objectives of 'sending signals' to the North Vietnamese and minimising public outcry in the West, when their objective should have been 'whether [a particular] mission would help us win the war'. Vogt's observation was given more definition by the respected military analyst Colonel Harry G. Summers, who argued that a major factor in the West's defeat in Indo-China was the usurpation of military strategy by civilian analysts. According to the Sum­mers' thesis, the analysts who had most influence with
Johnson and McNamara reduced military doctrine to a 'subset of economic utility theory', in which the application of cost/benefit analysis almost inevitably made the determined pursuit of military objectives seem like a failure of policy, contrary to the traditional view of war as the continuation of policy by other means.\(^6\)

There was undoubtedly a good deal of truth in Vogt's criticism and Summers' analysis. However, military air strategists were scarcely blameless themselves. Looking back on the perceived failure of the bombing of the North a decade after the war, four of the USAF's leaders from that period — Generals Curtis Le May, Leon Johnson, David Burchinal and Jack Catton — got closer to the real problem, albeit perhaps unintentionally.\(^6\) The four generals correctly identified the basic contradiction in air strategy in Vietnam. As they pointed out, the civilian 'whizz kids' working for McNamara 'did not understand air power', which they thought could be used 'like a scalpel' to provide a flexible response to communist aggression; that is, they believed they could apply 'just enough [bombing of North Vietnam], not too much'.\(^6\) Yet as General Burchinal noted, 'military force is a pretty damn blunt instrument' which should be used for 'maximum shock effect — hard, fast and continuous — [to] get the job done'. The problem was, if air power could not be used in accordance with General Burchinal's approach, the strategy was likely to unravel. Like any form of combat power, air bombardment must be applied in accordance with the prevailing political ethos. Vietnam was not Japan, and the war in Indo-China was not World War II. General LeMay's admission that at one stage he recommended that the USAF should 'go up and burn down North Vietnam' was not only morally unacceptable, but also an indictment of his understanding of air strategy in its fullest sense.

The final question which must be asked is why McNamara's analysts believed they could successfully apply air power in the way they attempted. In large part, the dominance claimed for strategic bombing by its proponents for a half a century, and the pre-eminent place in USAF thinking of Strategic Air Command, must bear some responsibility.

In fairness to air strategists, it is of course simplistic in the extreme to assert that air power 'failed' in Korea and Vietnam. In both wars the campaign of air support for combat forces was vital, through such operations as close air support, airlift, rescue, reconnaissance and so on. It is also easy to overlook the fact that, once again, Western armies and navies were able to fight on the surface free from enemy air attack; that is, their air forces had established control of the air. Mention should also be made of operation Linebacker II in Vietnam, when offensive air power was applied 'hard, fast and continuous' against selected targets, and proved to be a decisive factor in bringing North Vietnam to the negotiating table.\(^6\)

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Air Vice-Marshal H.N. Wrigley.

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If the wars in Asia had seen mixed success for air power (as they had for land and sea power), the best features of the air school of strategic thought were evident in the Middle East from the 1960s onwards. During the Six-Day War of 1967, the Yom Kippur War of 1973 and the air war in the Bekaa Valley in 1982, the Israeli Air Force (IAF) provided near-test book examples of air strategy. The key to the IAF's success was good planning, high quality training and a technological edge. Gaining control of the air was always the first priority, after which attack aircraft were used to devastating effect either on independent strike operations or in support or surface combat forces. The relative success of Arab ground forces during the first week of the Yom Kippur War was a direct consequence of their strategy to neutralise the IAF;\(^6\) equally, the Israeli's eventual victory seemed inevitable once the IAF had re-asserted itself.

The IAF was not the only air force to learn from the traumas of Indo-China. Following the West's defeat in Vietnam, airmen in a number of air forces, and
particular the USAF, embarked on a fundamental re-examination of their strategic thinking. They were aided in their conceptual work by important technological developments in such areas as guided weapons, electronic warfare, weapons systems, low observability (stealth) and command and control systems.

The relationship between air strategy and technology is obvious and critical. All other things being equal, an air force with a technological edge is likely to prevail. The development of precision guided munitions (PGMs) was especially significant. If over the years any one factor has weakened the position of air power theorists, it has been the comparatively indiscriminate nature of air bombardment and its associated unacceptable levels of ‘collateral’ damage. The production of PGMs and their associated target designator systems must therefore be recognised as a turning point in air strategy. If a target could be identified, it almost certainly could be hit. Equally as important as that ability to hit military targets ‘surgically’ was the concomitant control of collateral damage. Technology had caught up with ideas.

From the discussion presented so far in this article, it should be clear that while control of the air is the prime campaign, air bombardment has been the focus of air strategy. In turn, targeting is the key to air bombardment. The difficulties experienced in World War II, Korea and Vietnam were generally attributable either to incorrect target selection (for example, attacking targets which were not the most critical to the enemy’s ability to wage war), or inaccuracy, with the resultant public outcry over excessive collateral damage.

Modern weapons systems and PGMs had provided part of the answer to that problem. The other part came from a targeting strategy developed by USAF Colonel John A. Warden. While Warden’s model was developed specifically for the 1991 Gulf War, it has general relevance.

Warden’s deceptively simple targeting strategy identified not only the enemy’s centres of gravity, but also the priority in which they should be attacked. Attacks start at the centre of his ‘five strategic rings’ (see Figure 1) and work outwards. Note that command and control capabilities are the most important target, and an enemy’s fielded forces the least important. Note also that there is no place in the model for terror attacks on civilian populations. Details of the priorities within target sets in Warden’s model are listed at Figure 2.

The five strategic rings were used as the basis for offensive operations in the Gulf War. Coalition planners identified five objectives for the air campaign: gain control of the air; cripple Iraq’s strategic offensive weapons; isolate and incapacitate the Iraqi leadership; destroy a large percentage of key military production and infrastructure; and incapacitate the Iraqi army and armour in Kuwait. A classical general air strategy using each of the three campaigns was conducted. While the campaigns were applied concurrently, the initial priority was, properly, to ‘seize air superiority’ so that air strike and air support for combat forces could then proceed with relative freedom. In the event, that was precisely what happened, with control of the air being established within three days.

The air control campaign was followed by a strike campaign which was based initially on a concept plan codenamed Operation Instant Thunder. The wry choice of name — which was selected deliberately to contrast with Operation ‘Rolling Thunder’, the bombing campaign against North Vietnam from 1965 to 1968 — indicated that the lessons of Indo-China had been absorbed, assessed and applied. As was noted above, Rolling Thunder had been a prolonged, gradualistic campaign of piecemeal attacks designed to ‘send signals’ to North Vietnam’s leadership. By contrast, ‘Instant Thunder’ was designed to destroy 84 strategic targets in Iraq with great precision within a week, in a campaign which, if successful, would paralyse the Iraqi leadership, degrade their military capabilities and neutralise their will to fight. The air campaign developed from Instant Thunder was so effective that after 40 days of air attack only three days of land warfare were required. Targets were attacked with such precision there was negligible collateral damage. Those results suggested that the observation made by Sir John Slessor some 40 years previously that air interdiction can only succeed when supported by land forces was at the least open to question.

The success of air power in the Gulf War has been recorded in great detail elsewhere and needs no further comment here. Given the over-stated claims which have often been made for air power, one final observation is, however, warranted. It is clear that perhaps for the first time in history, air power effectively won a war, a conclusion reached not only by airmen, but also the United States Government and a number of independent commentators. Perhaps the most provocative response to the Gulf War emerged from the former Soviet Union. During the 1980s the Soviet General Staff had developed a concept of global air/space warfare which, its originators believed, could make victory in conventional war possible without either a large ground offensive or the occupation of territory, thus making conventional armies redundant. Some Russian experts consider that the success of the Coalition’s air forces in the Gulf affirmed that concept.
Figure 1
The Five Strategic Rings

Fielded Military Forces
National Will
Infrastructure
Key Production
National Command & Control

Figure 2
Target Systems

<table>
<thead>
<tr>
<th>Command &amp; Control</th>
<th>Key Production</th>
<th>Infrastructure</th>
<th>National Will</th>
<th>Fielded Forces</th>
</tr>
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<td>Railroads</td>
<td>PSYOPS</td>
<td>Air Defences</td>
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<tr>
<td>C31</td>
<td>Oil</td>
<td>Bridges</td>
<td></td>
<td>Strategic Offensive Forces</td>
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<td></td>
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<td>— Elite Forces</td>
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</table>
Conclusion

The three air campaigns of control of the air, air strike and air support for combat forces which in combination constitute a general air strategy have been understood and practised since World War I, even if their formal acceptance took considerably longer.

The development of armed forces is currently characterised by two trends: increasing inter-Service cooperation and growing single Service expertise. Those trends are not mutually exclusive; on the contrary, they are complementary. Joint Service expertise rests squarely on single Service professionalism. With those trends has come a search for consensus on the best employment of sea, land and air power. As far as air power and its associated strategic thought is concerned, that search has sometimes been unprofitably diverted by the exaggerated claims of air marshals and the indifference of admirals and generals. While the limited information base on air warfare in the 1920s and 1930s may have made those attitudes understandable then, there is no excuse for such insularity 70 years later.

Aerospace strategy has in fact been characterised by its consistency, to the extent that there is now broad agreement on its general thrust. Technological and social change will nevertheless demand the continual review and, if necessary, revision of the strategy. What will also remain a matter for debate — and rightly so — will be the emphasis given to each school of strategic thought during the development of composite strategies for joint operations.

NOTES

1. The author wishes to acknowledge other papers on this subject written by Group Captains J.S. Hamwood and B.J. Espeland, from which a number of valuable ideas were drawn.

The term ‘aerospace’ strategy, as distinct from ‘air’ strategy, is applied most correctly in relation to the United States Air Force (USAF), which for years has operated both space-based
and traditional air force assets. While the use of space by other air forces has been limited, it is increasing and will continue to do so. Consequently, this article uses 'aerospace' and 'air' as synonyms.


5. See Stephens, op. cit., passim.


8. See, for example, Alexander P. de Seversky, Air Power: Key to Survival, New York, Simon and Schuster, 1950.

9. The Air Power Manual, pp. 32-5. The first edition of The Air Power Manual called the second campaign 'Air Bombardment' rather than 'Air Strike'. At the time this article was written, it was the Air Power Studies Centre's intention to use the term 'Air Strike' in the second edition, due for publication in 1993.

10. Ibid., p. 33.


12. General B.L. Montgomery, High Command in War (a pamphlet produced for the General Officers of the Eighth Army), Tripoli, January 1943.

13. When the Royal Air Force was formed as an independent service in 1918, Trenchard was appointed CAS. He dominated British military aviation from World War I until his retirement in 1929.


18. Ibid., Vol VI, pp. 118-74.


22. By 1918 every modern air power role with the exception of electronic warfare and air-to-air refuelling had been conducted.


33. Ibid., p. 98.

34. Australian Archives, CRS A5954 (Shedden Papers) Box 1841.

35. For example, during a raid against the ball-bearing factories at Schweinfurt on 14 October 1943, the USAF's Eighth Air Force had lost 60 of 291 B-17 Flying Fortresses, a rate no combat force could sustain. Frankland, op. cit., pp. 77-8.

36. Ibid., pp. 78-85.


38. Quoted in John W.R. Taylor, Combat Aircraft of the World, London, Ebury Press, 1969, pp. 572. About 35,000 Il-2s were built, and the aircraft fought 'with considerable success' on every front where Soviet military forces were engaged.


44. Stephens, Power Plus Attitude, pp. 53-4.


50. Ibid., p. 97.


52. MacIsaac, 'Voices from the Central Blue', p. 643.


57. At the start of the Korean War, LeMay, as Commander of SAC, unofficially recommended that ‘we ought to turn SAC loose with incendiaries on some North Korean towns’. Quoted in Kohn and Harahan, op. cit., p.88.


61. See Kohn and Harahan, Strategic Air Warfare. LeMay’s posts included Chief of Staff, USAF, from 1962-65; Johnson’s Air Deputy, Supreme Allied Command Europe in the late 1950s; Burchinal’s Deputy Commander in Chief, US European Command from 1966-72; and Catton’s Commander, Military Airlift Command from 1969-72.


63. Quoted in Kohn and Harahan, Strategic Air Warfare, p.125.


67. The key ideas behind Warden’s strategy were raised in an important book published in 1989; see Warden, op. cit.


69. See pp.28-9 above.


71. Ibid. pp.131-3, 155, 166.

72. See p.26 above.

73. For a comprehensive review of the war, see Department of Defense, Conduct of the Persian Gulf War: Final Report to Congress; and Wing Commander Gary Waters, Gulf Lesson One, Air Power Studies Centre, 1992.


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Conclusions for Doctrine from the Air War in the Gulf

By Group Captain Gary Waters, RAAF

Undoubtedly, nations must apply the lessons from Desert Storm with care, since future military leaders will learn from the failure of Iraq’s military, and any apparent weaknesses in Allied operations. Additionally, attempts to identify the specific causes of victory will at best be subjective. Nevertheless, attempts should be made to distil the relevance to Australia of the many observations and lessons that emerge from an analysis of the Gulf War. This article represents but one attempt to do so, and concentrates on the air aspects, with emphasis on the broad doctrinal, or philosophical level.

The Royal Australian Air Force’s Air Power Studies Centre has undertaken a doctrinal analysis of the air war in the Persian Gulf. Results of the RAAF study were published in mid-1992 as ‘Gulf Lesson One — The Value of Air Power: Doctrinal Lessons for Australia’. This article presents a comprehensive summary of the major issues raised in the RAAF study, and will be included in the published version as its conclusion.

Iraq stood with 18 million people, armed principally with old Soviet equipment, and without the means of replacing that equipment, either through overseas buys or internal production. The coalition boasted an enormous combined population. The US, UK and France alone have a combined population of 350 million. They had state-of-the-art equipment and the defence industrial capacity to replace any that was lost in combat. The Allies were bound to win, and without substantial losses. The main question on 17 January 1991 was how minimal could the losses be kept.

Six weeks of air attacks, using 1,200 fighter/attack aircraft supported by another 1,200 aircraft were eventually required to conclude the War with Iraq. Ground attack was permitted against any Iraqi target deemed capable of supporting air defence or any other military operation. Destruction of Iraq’s Integrated Air Defence System (IADS) was critical to minimising Allied losses. Concurrent air campaigns were prosecuted in ensuring that the total campaign plan could be implemented. The logistics system had to provide food, munitions, fuel, spares and manpower to allow a sustained effort to be maintained.

Desert Storm witnessed a revolution in warfare. Surprise, concentration, and the simultaneous effect of stealth, precision and penetration occurred on a scale not witnessed previously. Offence decidedly beat defence, with air superiority proving vital. Air power prevailed over ground forces as the Iraqi field army was devastated by Allied air power, well-before the ground offensive commenced. The strategic attack theory was validated, and the paralysis imposed from the air meant that Saddam had to launch the Khafji offensive in an attempt to initiate the ground campaign. At night and in bad weather, air power defeated a corps-sized attack which was moving to Khafji.

The War showed that friction could be managed and that faulty equipment, inexperienced personnel, poor intelligence, unreliable communications and untested Command and Control (C2) do not necessarily come hand-in-glove with combat. It also vindicated the doctrinal pre-occupation with qualitative edge, in terms of people and high-technology weapons systems.

While air superiority once again proved to be fundamental to desert warfare, and to allow massive air support to ground forces to be generated, the lessons must not be misapplied. Desert warfare does not translate directly across to guerilla warfare in mountainous and jungle terrain; where even with air superiority, the contribution of air power to ground battles may be quite limited.

Israel’s forbearance of Scud missile attacks removed the opportunity for Saddam to portray the conflict as an anti-Zionist one, in which all Arab nations should support Iraq. Thus, Saddam’s major strategic weapon turned out to be a hollow one, reflecting an absence of political acumen. Furthermore, the Iraqis applied a poor military strategy and used troops who were not ideologically committed to the War. These factors do make the Gulf War unique, as many have suggested, and observations for warfare of the future do need to be tempered accordingly.

Assuredly, the Gulf War provided airmen with experience in locating, targeting and hitting targets after transiting through hostile airspace, with the ever-present threat of enemy fire. The high states of operational readiness which had to be maintained and the logistic and operational problems attendant with such an extensive air campaign will all add to the historical information available on campaigning in the air. It behoves Australia, and all nations for that matter, to look at this recent use of air power, to make observations relevant to national security interests and to derive hard lessons for the future.
Air power demonstrated its employability across the full spectrum of war. At the strategic level, it attacked the sources of Iraq’s military power; at the operational level, it disrupted and destroyed forces and re-supply before military forces could come into contact; and at the tactical level, it contributed to the outcome of individual surface battles.

The Gulf War was predominantly an air war, with a short land offensive at the end. The pursuit of Iraqis fleeing from constant air attack and the acceptance of final surrender could hardly be termed a ground war. This may indeed represent a telling indicator for the nature of warfare in the future.

Lessons from previous ‘one-off’ wars were learned and applied in Desert Storm. In like vein, lessons will come from this war and will have application in the future. Certainly, the way in which Desert Storm was conducted is not a prescription for all future wars, but outcome does carry with it attendant lessons that must be addressed and remembered for the future. Some of the more pertinent lessons and observations are summarised below.

### Strategic Issues

- Potential risks of conflict have become less clear, but nevertheless are still present. The move away from bi-polarity makes potential aggressors more difficult to identify now than at any time this century.
- The UN has emerged as a much stronger organisation; one that is prepared to resort to military action if necessary.
- The US has been recognised as having a leading role in international affairs of the future. Moreover, the US military, when free from political/civilian intrusion on planning and executing campaigns and without the imposition of restrictive Rules of Engagement (ROE) and enemy sanctuaries, proved to be a most adept and potent force.
- Australia must be careful not to take for granted the possibility of US or UN involvement in regional contingencies.
- Responsive, flexible, high-quality forces will be more in demand than ever before and the value of conventional deterrence will once again become pronounced. A small force deployed before conflict may be sufficient to avoid conflict, in which case it would be far better than a large force deployed once conflict had started. Importantly, strong political leadership and adroit military leadership characterised the victors in the Gulf War.
- Air forces proved to be responsive in meeting political and military requirements as the crisis worsened.
- Crisis management will probably be a feature of government and military planning for the future. In this, the responsiveness of air power will underwrite success. Responsiveness does not occur simply because a nation is able to project air power — it requires the right force structure, equipment, personnel, doctrine and training. Responsiveness also needs to be sustained through logistics and human resources management functions.
- Once again, military capability of an aggressor proved easier to gauge than political intent.
- Western populations will react adversely to deaths in combat, yet tend to accept that accidents will happen in lead-up to conflict.
- There is a need to plan for the cessation of hostilities, and for the political and military ‘way ahead’ to be just as clear as that for war.
- The Law of Armed Conflict (LOAC) and the concept of proportionality are likely to be significant factors in conflict of the future.
- There seems to have emerged an international political tolerance of war crimes, such as Saddam’s denial of civil liberties, mistreatment of Prisoners of War (POWs), destruction of Kuwaiti property, and murdering and brutalising of the Kuwaiti population. This is perhaps the most unsavoury aspect to emerge, and is an indictment on all leaders, especially the UN Security Council, for inaction.
- There is a certain political attractiveness in using air power to remove a threatening capability without destroying everything around it.
- Out-of-area operations are always likely and aircraft, equipment, procedures, practices and doctrine should be designed around such operations. Strategic sealift cannot always react in time for out of area operations and aircraft will be required. However, military aircraft will have to be augmented considerably by civilian assets.
- Even with precision weapons, against a resolute and numerous foe, an air campaign is unlikely to be concluded quickly, especially one that sets out to avoid collateral damage. Moreover, warfare of the future is likely to be conducted around civilians. In the Gulf War, the Allies were faced with the presence of Iraqi and Jordanian civilians, civil air traffic and civilian shipping.
- The precision of navigation and targeting systems and the weapons themselves which contributed to minimal collateral damage, loss of civilian lives and loss of Allied lives will be seen by most countries as a political necessity for future conflict.
**Docational Issues**

- Combined arms contributed to success. Modern warfare is all about joint operations, yet the very strengths of such operations demand strong single Service capabilities.
- Conflict of the future is unlikely to occur exactly as envisaged; hence broad plans are needed to cover as many contingencies as possible, and a flexible force structure is needed to implement any contingency plan.
- In coalition warfare, interoperability with allies becomes vital, especially where a coalition partner is of the size of the US, and contributions by smaller partners can only be made to the extent that forces are interoperable with larger US ones.
- Coalition warfare requires deft political acumen and close co-ordination of military operations. Common systems and doctrines are desirable, but not absolutely critical. Procedures, however, are fundamental, as the others can be worked around. Irrespective of the degree of commonality, one partner does need to take the lead or coordinating role.
- National forces were employed as units, so as to reduce procedural complexities, minimise confusion, and maintain individual morale. Additionally, national forces were rarely mixed. These are important observations for coalition warfare.
- Air power does not always have to operate in support of other forms of military power. The aim of joint operations should be to use the best form of military power for the task at hand, with the other forms providing the essential support as necessary. For the first 39 days, the Gulf War was an air war supported by ground and naval forces. Enforcement of the trade embargo was a naval operation supported by air and land forces, and the reclamation of Kuwait was a ground force operation supported by air and naval forces.
- War has no room for bureaucracy, committee consensus or inter-service rivalry. Peacetime priorities may pit one Service against another in a scramble for budget funding, but once conflict has been joined, only a team-effort will triumph. To that end, ADF elements must be well-versed in the intricacies of joint warfare, yet remain specialists in their own discrete (Service) forms of warfare.
- There are issues such as deficiencies in hardware for early warning, electronic combat, Airborne Warning and Control Systems (AWACS), Air-to-Air Refuelling (AAR) and Anti-Radiation Missiles (ARMS); lack of trained crews and cutbacks in operational flying hours which need to be addressed by Australia, if we expect to be successful in any conflict of the future.
- Warning time was very short, although preparation time for conflict was reasonable. Advance notice of deployment will always be desirable, as extensive work-up will be required if operational training has been curtailed in peacetime and if many essential war-fighting modifications are in the procurement pipeline, awaiting funding and embodiment.
- Rational ROE allowed the military to get on with its job, within the broad confines of political direction. For example, USAF fighters were able to engage enemy aircraft beyond visual range, using AWACS direction and AIM-7 missiles. This significantly reduced the possibility of USAF aircraft losses.
- Stealth technology emerged as a war winner, but given air supremacy, more conventional platforms were also very effective. To exploit the advantages of air power, force packaging has emerged as a fundamental issue for force structure deliberations of the future.
- Even with modern technology and the sophistication of intelligence systems, deception still had a prominent role. Both sides used deception to a large extent, and valuable lessons will be forthcoming as a result of subsequent detailed studies. Implicit within deception, was the use of diversion, and this could be given greater coverage in RAAF doctrine.
- Port and airfield facilities were of great value to the coalition and had Iraq retained any form of initiative, it could have attacked these high-value targets. Defence of such ‘targets’ assumes far greater importance when the enemy retains an ability to take the initiative.
- An understanding of the operating environment proved essential, and the lengthy build-up certainly assisted the Allies in this regard. Moreover, C2, training, tactics and an appreciation of air war at the operational level proved to be just as important as high technology equipment.
- The law of diminishing returns, often mentioned by air power proponents, was demonstrated. As targets became fewer, risks of exposure from lengthier times over target areas resulted; yet the need to maintain the offensive and to maintain an attrition rate of tactical Iraqi forces prevailed.
- Readiness to deploy was not synonymous with readiness to fight. Australia’s ‘fitted for not with’ concept should not be a cost exercise alone: it must address the issues of fitment and training times required for equipment to be embodied and brought to an operationally-ready state. The readiness to fight is described in this article as operational tempo.
The principles of war adopted by Australia were once again shown to be valid guidelines for the planning and conduct of war. Selection and maintenance of the aim, morale, offensive action, security, surprise, concentration of force, economy of effort, flexibility, co-operation, and administration were all witnessed in the Gulf War. If others should ever be added, based on the Gulf War, they should include the need to cultivate and maintain public opinion in favour of the particular war at the time, and the fundamental importance of unity of command.

Not all Iraqi threats had to be attacked, and some could simply be avoided, such as optically-laid Surface-to-Air Missiles (SAMs) and Anti-Aircraft Artillery (AAA).

For cumulative and sustained ‘punch’ from the air, only land-based air power was able to produce the effects demanded in the particular circumstances of the Gulf War.

Parallel air operations could be conducted, and were able to cripple Iraq’s strategic base in a few days. Importantly, parallel operations depended on the presence of stealth fighters, but also on appropriate force packaging. Furthermore, through adroit force packaging, aircraft of less capability were able to make a contribution. RAAF doctrine does mention conjoint operations, but could go much further in linking them to the composite wing concept.

Concurrent air campaigns, as espoused in RAAF doctrine, proved essential for the conduct of parallel air operations. Moreover, extensive air operations were shown as requiring a substantial support base, and small nations simply cannot afford to maintain more than one air force.

A greater ‘pay-off’ can be achieved by isolating enemy field forces and attriting them from the air than by attacking them in an early air/land offensive.

Air power shortened the time value of war in terms of lives lost, economic costs, political sensitivities, coalition cohesion, denying the enemy time to react, and providing more time for coalition responses to friction (enemy actions and quirks of nature, such as poor weather).

The Gulf War witnessed the responsiveness, flexibility, versatility, adaptability and mass of air power as war-winning characteristics. An air force, if it is to remain effective, must be able to provide the broadest spectrum of capabilities. While its depth of capability can be reduced, its breadth must not.

Friction, centre of gravity, interaction of offence and defence, and the value of personnel were again shown to be characteristics of the nature of war, and the Gulf War reinforced the recognition afforded these elements by RAAF doctrine.

The Allies found that air power could substitute for land power, but the Iraqis found that no amount of land power could substitute for air power. The utility of large-scale forces conducting paratroop or amphibious assaults seems less-favoured now than ever before. Perhaps Australia should address in its doctrine, the use of small air ranger and specialist marine amphibious groups.

A defensive air strategy is doomed to failure against an enemy who uses offensive air power to its limit. Furthermore, taking and maintaining the initiative relies on an ability to conduct offensive air operations.

War will include a doctrine versus doctrine contest, and the importance of doctrine has been enhanced as a result of the Gulf War. Many of the critics of air power and military power had not remained abreast of developments in doctrine. Furthermore, military doctrine should recognise the higher war aim which is to create the conditions necessary for peace.

The conduct of air power roles should not be tied to specific airframes, nor to ‘traditional’ methods necessarily. Flexibility in planning and use of all resources proved to be the key to success in the Gulf War.

Control of the air should be the prime campaign for Australia; but it is not an end in itself. Through air supremacy, Allied air, naval and land operations were carried out without the ‘friction’ induced by enemy aircraft. The Iraqis’ loss of control of the air saw Allied aircraft methodically destroy the military forces and supporting infrastructure of Iraq.

War at the level above guerilla warfare has been discussed as ‘hyperwar’, and air power proponents have claimed that the Gulf War is indeed a model for the conduct of hyperwar in the future.

The basic tenets of strategic air attack doctrine worked well for the air campaign: and the basic tenets of air/land doctrine worked well once the air/land offensive began. The two doctrines were complementary and not opposed as so many believed.

Counter Air

The effect of conducting Offensive Counter Air (OCA), while difficult and expensive, yielded a quite disproportionate return. The Iraqis, without air cover, were at the mercy of Allied forces which had air cover.

Fixed Command, Control and Communications (C3) systems, early warning radars, airfields and aircraft on the ground were shown to be vulnerable once
control of the air passed to the Allies. Even hardening lost its effect once the Allies gained free use of the air. The OCA campaign in the Gulf War saw priority airfields and critical elements such as runways, taxiways and airfield support services attacked.

• Long-term effectiveness in air combat demands resilient airbases, which provide the sustainment wherewithal for combat operations to be continued. Only through resilience can a primary limitation of air power (its dependence on fixed bases) be overcome.

• While Hardened Aircraft Shelters (HASs) did prove vulnerable, they still afforded protection to some Iraqi aircraft. Certainly, underground bunkers will receive more prominence, especially for critical elements of airbase resilience such as C2 functions.

• The intention of OCA should be to concentrate force against critical elements in order to achieve the desired results from one attack. Bomb Damage Assessment (BDA) is essential to ensure that effort is not wasted on unnecessary re-attacks, and that any re-attacks which prove necessary are targeted appropriately.

• Fighter sweep and fighter escort roles were a critical part of Allied offensive air operations (OCA and strategic air attack) and should be addressed more comprehensively in RAAF doctrine.

• Tactics should not be oriented solely around low-level attacks: an ability to switch rapidly to higher levels as necessary proved essential in the Gulf.

• Airfield security placed enormous demands on Allied manpower, although the presence of Saudi police eased the problem considerably.

• Australia needs to maintain a wide-area coverage of its national airspace, yet have the ability to concentrate force so as to attain a high degree of control of airspace over vital areas. The nation needs to use warning time and intelligence to defend pre-emptively — that is, to be prepared to engage before an enemy can attack. This demands improved detection systems, mobile systems and preferably some space-based sensors. Additionally, reduced reporting times are necessary. All of these factors were witnessed in the Gulf, and the valuable operational lessons need to be uncovered.

• Australia cannot afford vast numbers of any single defensive element, hence an integrated system which provides a synergistic effect is crucial. Thus, Australia’s IADS needs to be well-founded doctrinally, suitably-equipped and superbly trained. Moreover, as the Gulf War showed, all radars must be more resistant to Electronic Warfare (EW); communications must be more robust and redundant; and the entire IADS must train in a hostile EW environment.

• Combat Air Patrol (CAP) is situation-dependent and Australia must be able to use CAP to best effect. In this, the RAAF cannot afford to mount the broad defensive barrier CAPs which were witnessed in the Gulf, but needs to be able to position fighter CAPs for guaranteed interception. Accurate intelligence and timely warning are crucial to avoid CAP assets from being squandered, and an Airborne Early Warning and Control (AEW&C) capability is essential in this regard.

• Point-defence Low-Level Air Defence (LLAD) weapons are essential, although the Allies were not required to demonstrate their capability in the Gulf War. The susceptibility of Iraqi systems to ARMs highlights the need for weapons such as Stinger and Avenger, which are immune to ARMs, to be used.

• Air defence aircraft need self-protection measures (such as chaff, flares and air-to-air missiles) and if operating over enemy territory, Electronic Support Measures (ESM) kits, jammers and Suppression of Enemy Air Defences (SEAD) must also be provided.

• Passive Defensive Counter Air (DCA) measures, such as concealment, deception, camouflage and dispersal were used by the Iraqis, and to a limited extent provided certain lessons. The main observation is that if passive DCA measures prohibit the aircraft from being used quickly, then the potential for that aircraft to make a contribution will be lost. Because even hardened airfields can be destroyed or at least have their operations seriously disrupted, the use of off-base dispersal and development of aircraft which do not require lengthy runways need to be addressed in more detail.

• Agility in air-to-air combat, and capability for long-range interception are necessary elements of an air defence force. F/A-18s can provide both for Australia, but the force must maintain its edge in terms of operational training and embodiment of new offensive and defensive systems as they are developed.

### Strategic Air Attack

• A strategic air campaign should be designed around targeting the strategic base that allows a nation to wage war. To that end, priority targets should be Command, Control, Communications and Intelligence (C3I) systems, key production which affects military systems (such as electricity, water, oil, transportation infrastructure, national will, and the armed forces themselves.)
As unique as the Gulf War has been claimed to be, there would be many generic similarities in a strategic air campaign against most other nations. Campaign planning should centre around the numbers of targets and specific aim points so that the focus of air effort is not clouded and the effort itself is not dissipated. In this, a clear targeting cycle and precise mission planning guidelines need to be followed.

Interdiction was focused against critical nodes, but just as importantly, it was sustained over a lengthy-enough period to negate the Iraqis' capability for repair and improvisation.

The use of self-designating aircraft (such as the F-111) was preferable to pairing aircraft (such as the Buccaneer/Tornado GR.1), and the RAF were quick to bring into service two Thermal Imager and Laser Designator (TIALD) pods for use by their Tornado GR.1s.

The War showed that it is almost impossible to protect static targets once control of the air has been lost. However, mobile surface-to-surface missile (SSM) systems will be looked at in a more favourable light as a result of the experience with Scud systems. SSMs possess the potential for considerable political leverage and a disproportionate military effort was required to counter the Scud threat, which posed little threat of military significance, but one of great political significance.

The notion of a composite wing, demonstrated during the War, accords with the RAAF maxim of unity of air power, and should be addressed in RAAF doctrine. Moreover, the use of a 'maxi-base', while not possible for Australia in the short-term, should not be dismissed out of hand.

Strategic air defence is needed to protect a nation's strategic base — its centre of gravity. Thus, for Australia, its ability for strategic air defence must be significant by any attacker's standards, and plans for war-fighting must embrace attacking an enemy's strategic air defence assets at the outset.

Satellite and other imagery, interpretation of imagery and target analysis were essential to gain the most from the Allies' high-technology combat systems and well-trained operators. Thus, reconnaissance once again proved that it has a substantial role in air warfare. The ability to maintain the initiative was tied to the ability to undertake reconnaissance and surveillance. Reconnaissance proved vital for fluid situations, and in this, fluidity was not limited to mobility issues, but also encompassed the tempo of operations and the speed with which tactical conditions changed.

In-depth synoptic coverage was needed; that is, simultaneous electronic, optical and radar coverage of strategic and tactical targets. Sufficient reconnaissance assets were not provided, and more importantly, the ability to manage all of the information was inadequate. Weather, enemy action and competing demands conspired to use up all available reconnaissance capacity.

Real-time transmission of reconnaissance information was needed, but so too was quality imagery which was capable of being provided at night and in poor weather.

Lack of trained BDA analysts was a problem, and improved operational training may well be needed to overcome deficiencies evidenced in the Gulf.

Low-level reconnaissance proved necessary as the incidence of cloud increased during the War.

Laser-designating aircraft should carry videos for BDA, which would also assist those aircraft in conducting their own pre- and post-attack reconnaissance.

The RAAF must be prepared to conduct reconnaissance at night and in all-weather, thus the technology employed in the RAF's Tornado GR.1A aircraft will need to be evaluated for its applicability to the RAAF. Improvements are certainly needed in reconnaissance — the older RF-4Cs also proved successful — and there will be pressure on the RAAF to equip some F/A-18s with a reconnaissance pod or pallet for the future.

Unmanned Aerial Vehicles (UAVs) were suitable for specific tactical objectives, and satellites proved vital for many reconnaissance functions, but manned real-time, all-weather, specialised reconnaissance aircraft still proved necessary.

A long-range low-level high-speed reconnaissance Remotely-Piloted Vehicle (RPV)/UAV, employing stealth technology, may represent part of the answer for Australia.

In the Gulf, Allied EW equipment needed to be reprogrammable and threat data needed to be current and accurate. Any software changes were strictly controlled. Furthermore, positive identification of emitting radars was necessary to avoid fratricide.
CONCLUSIONS FOR DOCTRINE FROM THE AIR WAR IN THE GULF

• Technological developments with chaff, jammers, Radar Warning Receivers (RWRs) and missile warning systems featured prominently in Allied air operations in the Gulf.

• Specialised jamming aircraft such as the EF-111A and SEAD aircraft such as the F-4G proved their worth. Suppressing enemy air defences was considered to be only part of the equation, since SAMs could still be launched ballistically after SEAD attacks, and radars could be repaired. Hence, sites were bombed as well, to destroy the radars and missiles.

• The Electronic Combat (EC) package also included drones. Moreover, the ability for F/A-18 Hornets, for instance, to fly SEAD and attack missions on the one sortie could be pursued by Australia.

• Electronic combat has become so important that its organisation, just as that for intelligence, needs to be integrated into operational mission planning at the outset.

Airlift

• Airlift equated to rapid deployability and saw greater demand placed on its services than it had the capacity to meet. Civil augmentation was necessary. The Allies deployed with their own airfield civil engineering support, air terminal and air traffic control facilities, security, communications and Search and Rescue (SAR).

• Wear and tear on airfields in the Gulf was minimised because of runway length and multiple runways. The runway at Incirlik, Turkey, however did suffer damage from excessive use.

• Combat SAR was a crucial element and could be addressed in more depth in RAAF doctrine. Combat survival training also produced some interesting observations, and could be afforded greater coverage in RAAF doctrine. Additionally, RAAF doctrine could address in more detail the role of airlift in special operations (such as Special Action Service (SAS) deployments) and special missions, especially psychological operations. The use of leaflets and loudspeakers when combined with continued bombing sapped the Iraqis' morale. One other aspect, which is not addressed by RAAF doctrine at all is the provision of civil affairs teams, which had a significant impact on local communities in the Gulf.

Air/Sea Warfare

• Over-the-Horizon Radar (OTHR) could provide substantially more in assisting in the role of Anti-Surface Shipping Warfare (ASuW), especially for provision of surface targeting data, and developments by the US should be monitored closely by Australia.

• Weapons such as Exocet and Sea Skua have highlighted the vulnerability of surface ships and Australia could conceivably improve its ASuW and maritime strike capabilities at quite modest costs. However, it is difficult to make general observations from the Gulf War because Iraqi ships carried little in the way of Close-In Weapons Systems (CIWS).

• USN Hornets demonstrated their multi-role versatility in shooting down two MiG-21s and then continued on to prosecute a ground attack mission. The predominant role for USN aircraft was in fleet defense and only 13 strike sorties per day, on average, were flown from each of the six US carriers.

• Mining did not pose the problem during the War that many expected, although after the ceasefire, an enormous clearing effort was required. In mine-hunting from the air, use of airborne mine detection systems which incorporate laser-based sensors to detect sub-surface mines bears further investigation by Australia.

• Some interesting points for navies arose from the War — the need for more sustained combat punch over-land from naval aircraft; the vulnerability of surface ships (especially to stealth aircraft); and the observation that surface ships proved vital for embargo duties and sealift, but not for the actual combat effort perse.

Air/Land Warfare

• Battlefield Air Interdiction (BAI) was conducted in the most appropriate manner, with all Iraqi tactical supply routes attacked and with friendly forces holding the initiative on the ground.

• BAI was flown from the very first and Close Air Support (CAILS) occurred mainly during the land offensive as forces closed. Essentially, land force action and hence CAIRS did not occur until sufficient levels of destruction had been inflicted on the Iraqis that the ensuing ground offensive could be decisive.
The best time to attack enemy vehicles was when they moved to contact, as they represented higher-value targets than did vehicles which were further from the battlefield. Vehicles moving to contact are likely to be combat ones, whereas in rear areas, there is a good chance that vehicles will be support ones. However, for Allied air power to respond as Iraqi forces moved to contact, aircraft had to be on CAP or ground alert. Both proved expensive in terms of crew duty time.

Many analysts have argued that air power shaped the battlefield and conditioned the Iraqis perfectly for the ensuing ground offensive. Yet others have argued that air power actually destroyed the battlefield and set the scene for an Allied rout which had but to accept the Iraqi surrender.

Specialised CAIRS aircraft (such as the A-10) were successful, but so too were multi-role aircraft (especially the F-16), and less-sophisticated aircraft (such as the Hawk). ‘Strategic’ attack aircraft (such as the F-111 and B-52) were also used.

RAAF doctrine could expand its treatment of control of the air, recognising that air supremacy can be attained (even by Australia) and that air supremacy will have a marked effect on the conduct of subsequent tactical battles. So much so, that any battle for control of the air should consider attaining air supremacy if possible.

RAAF doctrine could also address the point that an enemy will not have an inexhaustible air power capability and that a comprehensive BAI/CAIRS campaign could be undertaken once air supremacy had been gained and deployed enemy LLAD destroyed.

Speed of aircraft over the battlefield has been argued as a counter to their use for CAIRS; yet the Gulf War showed that through innovative use of Forward Air Controllers (FACs), such problems could be resolved.

Use of clear markings and Infra-Red (IR) beacons for example, proved necessary to identify friendly ground forces from the air. While the incidence of fratricide was low, it was still unacceptable, and there are obvious ramifications for Australia of future developments in this regard. In particular, the Anti-Fratricide Identification Device (AFID) which was brought into theatre just as the War ended, may be appropriate for the Australian Defence Force (ADF). Carelessness with fire and insufficient procedural attention to avoiding fratricide can undo everything that a combined arms offensive achieves.

The air/land offensive exploited manoeuvre theory, and the logistics systems had to remain flexible and adaptable to keep pace with the combat forces. Lessons will emerge that will have a profound effect on the future structuring of logistics forces.

### Force Multipliers

- Force multipliers of AAR, AWACS, Airborne Battlefield Command and Control Centre (ABCCC) and Joint-Surveillance Target Attack Radar System (J-STARS) featured prominently in the air war.
- AAR proved fundamental to the effective employment of air power through its contribution to greater range and endurance, and increased flexibility in planning. It allowed defensive CAPs to be mounted further out from Allied airbases; which in itself is an important observation for Australia. Many aircraft types relied on AAR to provide them with the flexibility that allowed them to be employed on various roles.
- The conduct of AAR provided several lessons such as: the need for commonality in equipment and procedures in coalition warfare; the need for adequate training; the need for redundancies; and the need for tankers to remain on station for ‘stragglers’. Probably, the main observation was that more aircraft needed to be refuelled more rapidly.
- AWACS provided an airborne early warning, fighter control and air traffic control facility. Its ‘big picture’ capability was without equal.
- The low number of Allied aircraft losses was in part attributable to AWACS aircraft, and certainly the absence of air-to-air fratricide was largely because of AWACS aircraft. Ducting problems within the atmosphere affected the performance of mobile Ground-Based Radars (GBRs), and AWACS was able to provide the early warning coverage needed.
- An AWACS capability for any nation can help reduce the numbers of fighter aircraft required for defensive CAP.
- A counter to air and ground-launched ARMs is required for AWACS, as is an ability to down-link the entire air picture quickly.
- ABCCC aircraft provided the necessary airborne C2 for tactical operations in forward battle areas and acted as a local command centre for special air operations.
- J-STARS provided essential ground target information and could cover wide areas and more specific targets, even down to individual vehicles. It could also evaluate the results of air-to-ground attacks immediately.
Importantly, battle management systems such as AWACS and J-STARS provided the wherewithal to maintain a system of detecting, targeting and attacking the critical nodes of Iraq's war-fighting capability. Real-time targeting and attack destroyed Iraqi military forces at a rate previously unequalled.

**Command, Control, Communications and Intelligence**

- C3I systems were integral to the Allies maintaining the initiative. Centralised C2 and decentralised execution underwrote the success of the total network. Without effective C3I, any defences will be slow to react to mobile/manoeuvre warfare. Even when forced on the defensive, coalition forces brought artillery and tank fire, anti-tank guided missiles and CAIRS to bear against the Iraqi field army. Air superiority made this possible.

- The air commander must be a decision-maker and a battle-planner; hence fusion of all intelligence, EW, reconnaissance products and BDA will be critical to his campaign planning. In this, Automated Data Processing (ADP) is vital. Another important issue is the amalgamation of information into the one data base, again maximising the use of computers. An integrated intelligence data base, with automated communications, linked to an air commander's C2 decisions shows the inextricable ties that bring command and control, communications and intelligence together into the one coherent system. Computer-based Decision Support Systems and Mission Support Systems proved to be vital aids to decision-making and planning. However, computers were never allowed to take away the essential decision-making function of the commander.

- Indivisibility for forces tailored for a specific task and unity of command over those forces was more than a doctrinal imperative — it was a proven war-winning action. Unity of air power was shown to be essential so that appropriate apportionment decisions and other elements of co-ordination could be made by the Joint Force Air Component Commander (JFACC), around the Joint Force Commander’s (JFC’s) campaign plan. Importantly, even the B-52s were regarded as theatre assets and were under theatre control. Yet, many elements of 'tactical' air power were not tasked by the Air Tasking Order (ATO), and thus not unified under the JFACC. In circumstances where less air power may be provided, such a failing could be critical. Doctrinally, balance was shown to be as important as unity, for it was balance in the force structure that ensured assets largely were neither under-utilised nor over-committed.

- Because USN aircraft could not be absorbed readily into the ATO, not all aircraft were used to best effect. There will always be a problem with organic air power which serves the dictates of two masters — its own parent Service and the broader air campaign. It is axiomatic to argue the criticality of good leadership, but it is just as crucial to have a single concept of air operations, and the one air commander.

- The ATO was needed for 'de-confliction' and to manage the large numbers of aircraft. Yet, by its very nature, the ATO was fragile and some form of redundancy does need to be built-in for the future, to ensure that the tasking system can still operate in a hostile EW environment and where enemy aircraft are flying.

- Airspace management was perhaps under-valued early in the deployment, but became so important that a separate Airspace Co-ordination Order (ACO) was required.

- The ability to control air assets and re-target in real-time, so as to keep planning abreast of the fluidity of combat proved essential.

- Despite doctrinal comments about the importance of Communications Security (COMSEC), early Allied practices showed an apparent lack of understanding and discipline. The requirement for non-jammable air-to-air communications was met through the installation of Have Quick radios.

- Use of space-based systems proved to be the only way of meeting the unprecedented requirement for communications. Australia must realise though that any participation in the US space programme will necessarily tie Australia to US global security interests.

- Radio navigation aids, air traffic control and approach radars, landing systems, and ground-to-air communications all had to be tested and calibrated; with USAF C-29A aircraft being used.

- Commonality of communications and computer systems, such that all elements of the force can communicate, would appear to be essential. Yet, USN and USAF elements for example operated incompatible equipments. Moreover, common procedures need to be promulgated (as they were by the Allies) to ensure that the overall communications system can work efficiently.

- Communications systems need to be rugged and reliable and to have in-built redundancies and resistance to jamming.

- The trend towards technological advancements saw a corresponding concentration on imagery and
signals intelligence, at the cost of human intelligence (HUMINT). HUMINT is an inexpensive, unsophisticated method of gathering intelligence, yet has so much to offer.

- National intelligence cannot be limited to military elements, but must encompass political, diplomatic, economic, sociological and ecological spheres.
- Coalition warfare demands a certain openness and sharing of intelligence which could compromise sources and methods of gathering. Moreover, intelligence at all levels must be shared — from the tactical, through the operational to the strategic.
- Intelligence on an enemy’s technical capabilities and numbers of weapons systems is no longer sufficient. Intelligence must be oriented towards an enemy's intentions, strategies and doctrines as well.
- Despite a lot of criticism, intelligence and BDA functions did work quite well, but the pace of the War demanded even greater efforts. Real-time links between operators, intelligence specialists and EW personnel were shown to be vital.
- Intelligence-gathering assets must be managed to avoid duplication, and to achieve even-coverage of targets. A high-altitude UAV, with long endurance may well emerge as a partial solution.
- Fusion of information from cockpit video, tactical reconnaissance aircraft and satellites was the crucial factor in the intelligence equation, the Joint Intelligence Centres (JICs) must become a facet of modern warfare.
- The Gulf War showed that more real-time information was required than anticipated; an improved ability to process it quickly was needed; and an improved dissemination capability was essential.
- Future intelligence systems must provide for the elimination of duplication; centralisation of control and integration of all information (fusion); decentralisation of effort to the tactical level; and joint planning.

**Logistics and Infrastructure**

- Preparedness through readiness (operational training levels) and sustainability (stockpiling, rapid acquisition and distribution systems) was essential before the Allies could adopt a war footing. Furthermore, the ability of combined logistics, including host-nation support, preparedness of the industrial base and pre-positioning, to procure, store, repair, maintain and distribute spares and equipment and to operate management information systems all contributed to the generation of air capabilities by the Allies.
- Commonality of equipment and procedures, mentioned earlier, extended to commonality of logistics functions (especially maintenance and spares support) and was able to improve the conduct of coalition warfare by a significant degree. Civilian contractors, national industry and elements of civilian infrastructure were essential in supporting the military logistics function.
- Logistics requirements tend to be for operations not planned for, in geographic areas not anticipated. Thus the logistics system needs to be very flexible, adaptable and capable of supporting a wide range of contingencies.
- Logistics planning was firmly embedded in operational planning during the Gulf War, and initiatives taken by the RAAF in recent years have already set in train a similar capability for integrated planning. This enhances the responsiveness of logistics to operations and also provides logisticians with a better understanding of the operational implications of their logistics decisions.
- More extensive pre-positioning of stores, commonality of computer systems and better control over spares emerged as important lessons from the War.
- Deployment to remote bases carries an attendant cost in terms of logistics and infrastructure support, and Australia could learn many valuable lessons from an in-depth analysis of this aspect of Gulf War operations.
- Automation of logistics systems was necessary to cope with the deluge of requisitions. Moreover, logistics systems had to be rugged, reliable and redundant (just as were communications systems).
- Pre-positioning of weapons and stores (such as the Marines did at Diego Garcia in the Indian Ocean) alleviated re-supply problems to a certain extent. This has obvious ramifications for Australia in terms of mounting air operations from remote bare bases. One other observation should be made here, and that is receiving nations are more likely to accept other nations pre-positioning stocks of domestic stores rather than weapons on their territory.
- Pre-positioning, host-nation support and lateral support (from other theatres) were all essential to the effectiveness of the logistics function in the Gulf. The lengthy deployment phase also helped as combat elements were not displaced by logistics elements, yet logistics were ready when needed.
- Transportation requirements were enormous, with use of Reservists and civilians proving fundamental to any attempt at meeting those requirements. Transportation was a problem within theatre as well, and
large numbers of trucks were required; as were containers to ship supplies, and packaging material.
- In terms of maintenance, adaptability of systems, innovative practices by ground crew, contingency maintenance, battle damage repair and high levels of contractor support were all important and require further detailed study.
- Both the USAF and RAF had to augment their maintenance teams, and many mainland units were seriously affected by the level of support required for a 'medium-level contingency'.
- Extensive modifications were undertaken on many aircraft and the British Tornados for instance which returned from the Gulf were substantially different aircraft from those that lined the tarmac in July 1990. The ability of the RAF to install and test so many modifications is a vital observation for Australia.
- New equipment did not function perfectly on its first test after fitment and several iterations were required before it functioned as planned. Thus, the embodiment of many new equipments and modifications during transition to war was shown to be dependent on sufficient time and expertise for all systems to be made effective and for personnel to be trained in their use.
- Because of sound logistics, the average sortie rates, mission capable rates and aircraft utilisation rates for US aircraft in particular increased during the War, some substantially.
- Replenishment programmes of stocks and weapons which are likely to be consumed in war need to be in-place in peacetime. That is, contracts for replacement of war stocks need to be 'fast-tracked'. The UK's concept of six-day war stockholdings for a NATO contingency was found wanting. Australia has much to learn in this regard. Additionally, safety margins for stockholdings had to be implemented to compensate for the harsher operating climate, extended lines of supply, and the operational consequences of stock-outs and consequential grounding of aircraft during wartime.
- Standard means of re-supply were not sufficient and the 'Desert Express' had to be used to fly-in critical spares from the US.
- Only those items which were requested by deployed units were supplied. That is, a 'pull' system operated, rather than a 'push' system, which in past conflicts has seen supplies (particularly US) rushed into theatre simply because they were available.
- The high demand for fuel was met partially through construction of fuel pipelines and storage facilities; an important observation for forces operating over extended lines of supply.
- The threat of Nuclear, Biological and Chemical (NBC) warfare saw the need for special NBC protection suits, respirators, water purification plants, and certain nerve-agent antidotes. This is an aspect for which Australia needs to do considerably more.
- An extensive programme for treating casualties and evacuating medical emergencies was implemented. The RAF even employed musicians to augment medical teams. Importantly, US, UK and European hospitals provided significant levels of assistance and geared-up to accept thousands of patients if necessary.

**Human Resources Management**

- A complex system for handling enemy POWs in accordance with the Geneva Convention had to be adopted. Other LOAC issues (especially the concept of proportionality) also figured in campaign planning.
- Coalition forces were centralised around a joint and combined force concept; yet each Service retained its individual identity. Thus, specialist training, institutional culture, intuition, and professional experience and knowledge were retained and focussed on the notion of complementarity in joint operations, and not on the notion of 'sameness'.
- Morale of Allied forces was a critical factor, and overwhelming public support generated the sending of mail, books, magazines and many other items to personnel in the Gulf. In stark contrast, Iraqi morale was sapped and even the members of the elite Republican Guard appeared to suffer as much as the conscripted Iraqi soldiers.
- The stress-fear-fatigue relationship in modern combat should provide a wealth of material for subsequent study. The stress of being in new surroundings and of being exposed to combat for the first time would have induced fear, which in turn could lead to the onset of fatigue more quickly than in peacetime training. Lessons for managing fatigue which emerge from the Gulf War will be important for future planning.
- Training as always proved fundamental, and the importance of RAF operational low flying and armament practice camps and USAF Red Flag training should provide significant lessons for Australia. Moreover, training in joint procedures was inimical to success.
- Multi-role capabilities of aircraft necessitate additional training of crews and continual refinement of multiple sets of tactics and procedures. This
Additional training cannot be met by cutting operational flying hours in peacetime.

- Lessons to emerge in terms of training centre around the need for realism, which encompasses firing live missiles, maintaining high sortie rates, and flying around-the-clock missions. This has a flow-on effect to ground crew and their training as well.

- While tactical level training was important, so too was operational training which saw a collection of forces operate in specialised, joint and combined missions. Implicit in training for war is the development of discipline, leadership skills and personal versatility. While knowledge and judgement can be practised and even quantified at the tactical level, such is not the case at the operational level, where greater efforts seem warranted, to inculcate and test appropriate knowledge and judgement.

- As force structures reduce and military forces are expected to achieve more with less, quality equipment, personnel and training and readiness in peacetime will come more to the fore. These are expensive propositions and cannot be achieved 'on the cheap'. Even with realistic training and high levels of readiness, USAF and RAF forces needed work-up time to reach an operational tempo. The observation that high intensity training needs to be provided to at least an element of each squadron, such that the element is fully combat-ready, could be the most important tactical observation to emerge from the Gulf War.

- While the use of Reservists proved effective during the War, there were several observations which need to be studied. First, the pool for Reservist airmen and ground crew tends to be from ex-Regulars, and the pool of ex-Regulars will dwindle as force structure reductions take effect. The costs of maintaining Reservists at combat-ready states are high and there is always a problem of availability, where the Reservist has other job commitments. Reduced costs for Reservists also carry reduced effectiveness levels, and from that there is no escape.

- The RAF has already trialled a reserve aircrew scheme and implemented a 'civilianisation' policy, and the RAAF would do well to draw on RAF experience to save it from making some of the mistakes from which the RAF has had to recover.

- Civilian support in-theatre was remarkable and extensive; yet there appears to have been little attention paid to compensation in the event of death or injury from war actions. This is a new factor of modern warfare which needs to be addressed.

- The diversification of traditional military industries saw a lack of capacity to surge sufficiently to meet all requirements; although, civilian contractors did provide an amazing array of support services. Defence-unique industries and other critical industries (such as those associated with Anti Submarine Warfare (ASW), stealth and air-to-air missiles) may need more extensive government support in the future; especially in terms of maintaining a surge capability. More predictable defence budget support for select industries may be the only option open to governments that wish to retain appropriate levels of defence industry support from the civilian sector.

- The presence of the media posed certain problems in terms of resources; such as the provision of military transport, escorts, accommodation and basic-subsistence. Furthermore, there were problems of operational security and instances where sensitive operational information alerted the Iraqis. However, positive military advantages did flow, with popular support at home and increased morale of the deployed personnel resulting from the way in which this 'just' war was reported. There were also advantages which assisted in the formulation and conduct of Allied deception plans, and undoubtedly, some disinformation was spread as well.

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**Technology**

- High-technology does provide a qualitative edge — attack aircraft equipped with Laser Guided Bombs (LGBs) and self-protection EW systems and ARM capabilities demonstrated their war-winning worth. However, dependence on technology carried with it a concomitant dependence on serviceability, reliability and the ability to incorporate operational enhancements.

- While the ability to fly at night and in all-weather proved essential, so too did the possession of appropriate and effective acquisition, targeting and navigation systems.

- Specialised aircraft were important, but older and less-capable aircraft (including trainers) demonstrated their worth in combat, under certain circumstances.

- Technology offers so much, yet it must be balanced to operational requirements and doctrines. The effectiveness of Forward Looking Infra-Red (FLIR), Global Positioning System (GPS), Night Vision Goggles (NVGs), self-defence EW systems and ARMs has been assessed by Australia, and some procurement decisions have been taken already. Importantly, the Low-Altitude Navigation and Targeting Infra-Red system for Night (LANTIRN)
and TIALD pods have much to offer Australia. The performance of ARMs and the many different types of air-to-surface missiles cannot be allowed to pass without detailed assessment for their applicability to the nation. Furthermore, the observation that high-technology systems demand a complex and comprehensive support system to ensure reliability cannot pass unnoticed.

- The attractiveness of tactical fighters as a ‘cure-all’ should be tempered by the point that Iraq was vulnerable to land-based tactical air power because of the availability to the Allies of suitable airbases and because of the length of preparation time afforded. Force structures throughout the world are likely to argue for fighter/bomber combinations, armed with Precision Guided Munitions (PGMs) and supported by satellite navigation as the most flexible form of air power, to carry out pin-point strategic attacks and, when coupled with AWACS, to provide the defensive component as well. However, there will still be times when long-range, single ‘stealth’ bomber aircraft would be needed, where complex force packaging of multi-role fighter/bombers and tankers may not suffice.

- The value of organisations such as the RAAF’s Aircraft Research and Development Unit (ARDU) and the RAF’s Central Trials and Tactics Organisation (CTTO) was underscored during the War. CTTO provided substantial support in helping RAF squadrons reach operational tempo; although the manning of CTTO needed augmentation, and Australia would do well to heed the lessons from the CTTO experience.

- Compatibility problems between some systems, which had to be fitted quickly, highlighted the problem of ‘fitted for not with’ concepts, which result in different equipments not actually being operated together until conflict eventuates.

- Improvements in micro-processors and algorithms and the provision of compact multi-sensors with shared components will probably represent the areas of greatest technological interest for Australia in the future.

- The value of stealth, when applied to bombers, can almost obviate the need to fight for air superiority first. For stealth allows a force to control the airspace it wishes to use for long enough to conduct its mission. As a strategy therefore, the use of a long-range bomber to penetrate enemy territory unaided and undetected, and to attack with precision, has stood the test of war. Air power provides the capability to take the war to an enemy, irrespective of whether air, land or sea superiority has been won.

- Low-observable (stealth) technology will receive renewed interest; yet this need not necessarily extend to a stealth aircraft such as the F-117. Use of Radar Absorbent Material (RAM) and Surface Wave Absorbent Material (SWAM), as demonstrated by RAF Tornados especially, is a relatively inexpensive method of reducing radar cross-sections of aircraft, and should be investigated more thoroughly by Australia.

- Importantly, parallel air operations can be effected only with stealth aircraft or force packages. Use of a few stealth aircraft for heavily-defended targets and use of conventional aircraft for most other targets would appear to be a sensible compromise for the high cost of stealth.

- Smart weapons are worth their high cost, but they still rely on accurate and timely tactical intelligence about their targets. Even with air supremacy and smart systems, the Allies encountered considerable problems in locating mobile Scud launchers.

- PGMs, through remote designation at night, allowed air attacks to be prosecuted under the most favourable conditions to the attacking aircraft, in terms of survivability and successful mission accomplishment. Further developments will probably see the effect of bad weather negated.

- The ability to attach laser guidance kits and stabiliser/directional fins to ‘dumb’ bombs and produce a relatively inexpensive PGM warrants further consideration by Australia, including government support of such projects.

- Future developments will probably see a runway attack weapon that can be released from a stand-off range and guided to target. A stand-off capability for all PGMs is likely to be pursued because of its precision, increased protection and potential for positive control.

- The War showed that there is no universal PGM and a variety is needed for weapon-to-target matching and for providing the flexibility to vary attack profiles and delivery tactics as necessary.

- Tactical Land Attack Missiles (TLAMs) such as Tomahawk made a significant contribution, not only to the war effort through their ability to hit strategic targets in heavily-defended Baghdad, but also to the conceptual debate about whether they represent air power or not. TLAMs were tasked in the ATO by the JFACC.

- The threat of weapons of mass destruction can have an almost-hysterical effect on populations, and weapons with little military effect can have quite disproportionate effects at the political/strategic level. Methods of countering such weapons and training in NBC environments have become essential. Developments of Tactical Anti-Ballistic Missile
Systems (TABMS) and Theater High Altitude Area Defence (THAAD) systems will be instrumental to the ability of nations to counter surface-to-surface missile systems.

- For Australia, the use of multi-capable platforms, an appropriate mix of smart and dumb bombs, and early detection of target sets is a clear way ahead.
- Development of space-based systems will undoubtedly be followed keenly by Australia. The promise of 'lightsats', which may offer multi-mission flexibility within the decade, and less-expensive satellite launch requirements may bring the use of space systems more within Australia's reach.
- There are operational problems with satellites, but through robustness and redundancies, many problems can be alleviated. Satellites provided early warning, reconnaissance and surveillance, electronic signals intelligence, navigation, communications and meteorology during the Gulf War.
- Reliance on external nations for satellite-gathered strategic intelligence will always pose operating restrictions on the ADF and Australian doctrine should more clearly reflect this.

The dominance of air power, discussed in this article, should not be seen to run counter to the Australian Defence Force's concept of joint operations. Combat operations in all three environments can indeed produce a synergistic effect. Hence, there is an abiding need to develop doctrine, operational art, tactics, techniques and procedures so as to be assured of that synergy. Nevertheless, joint operations should not be seen as negating the need for doctrine, operational art, tactics, techniques and procedures in the unique environment themselves. Thus, the development of joint doctrine and the dominance of air power in the Gulf War are by no means contradictory. In fact, as President Bush said on 13 April 1991: 'True "joint" is using the right tool at the right time'.

The Australian Labor Party's (ALP's) Federal Leader and South Australian Premier, John Bannon, said on 1 March 1991: 'The ceasefire in the Gulf marked the end of an amazing and appalling piece of conflict in this world which indicates surely, as strongly as anything might, the need for defence preparedness and the need for us in Australia not to be complacent about our ability to protect ourselves and to join with allies and friends in ensuring peace and security in the world'. One such contribution to defence preparedness is in learning the right lessons from the Gulf War and in applying them correctly and sensibly.

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Group Captain Gary Waters joined the RAAF in January 1969. His more recent postings have included Bracknell UK, where he attended the RAF Advanced Staff Course in 1985, and RAAF Staff College, Fairbairn Canberra from 1986 to 1988, where he served as an instructor and then Director of Air Operations Studies. In January 1989, he was appointed Director of Studies at RAAFSC for the review of the RAAF's Command and Staff Course. In June 1989, he was posted for six months to the newly formed Air Power Studies Centre, where he contributed to the writing of the AAP 1000, Royal Australian Air Force Air Power Manual.

From January 1990 he was the RAAF Visiting Fellow to the Strategic and Defence Studies Centre at the Australian National University, where he produced two books: RAAF Air Power Doctrine: A Collection of Contemporary Essays and The Architect of Victory: Air Campaigns for Australia, both published by SDSC. In May 1991, he was posted back to the Air Power Studies Centre, where he undertook a study of the Gulf War and produced a book entitled Gulf Lesson One — The Value of Air Power: Doctrinal Lessons for Australia, published in June 1992.

He was employed in the Directorate of Logistics Development and Planning during 1992, where he produced several papers on logistics doctrine and strategic planning and a book entitled Line Honours: Logistics Lessons of the Gulf War, published in December 1992. In January 1993, he was posted as the Director of the Air Power Studies Centre.
Towards a Doctrine of Combat Power

By Air Commodore Norman Ashworth, RAAF (Ret.).

I

times long past, before the advent of the aeroplane, military theory and doctrine was, relatively, simple. So too was the division of roles and tasks between the, then, two armed services. The army fought on the land and the navy at sea. The only small exception to this simple rule was the marines, who as naval soldiers, fought both on the land and at sea. The marines, although part of the navy, used army ranks and organisation. On the land they fought according to army doctrine and procedures, and at sea merely adapted their, essentially, army tactics to the close quarter sea battle. With the end of the era of sail, so ended the marines direct role in the war at sea. Tradition, which influences so much of what is done in the military, has enabled the marines to survive, their modern role being that of amphibious assault.

When the aeroplane arrived as a weapon of war it upset the previous simple division between land and sea power. Being able to range over land and sea and to impact heavily on the land battle and the war at sea, the advent of the aeroplane led to the formation of a third armed service and to the development of the concept of air power. Military theory now encompasses the concept of military, or combat, power as being an amalgam of land, sea and air power.

Part of the difficulty of looking at land, sea and air power as separate elements is a confusion in classification. The three elements of combat power can be classified according to environment, vehicle or organisation. Thus, for example, land power can be taken as covering all aspects of: the land battle; the use of ground fighting vehicles, weapon systems and people fighting on the ground; or, the use of combat power, by the army. Similarly, sea power can cover the war at sea, the use of warships, or naval combat power, just as air power can cover the air war, the use of aircraft for combat and combat support, or air force power. While at the core, these classifications all cover the same thing, at the periphery, there is a significant overlap with the other elements of combat power.

Aside from the obvious example of the impact of air power on the land battle and the war at sea, other examples of overlap are: naval vessels, which are clearly a central element of sea power, can, through naval gunfire support, play a role in the land battle; ground based anti-aircraft missiles can be used to defend a city against air attack; and, armies and navies can, and do, operate military combat aircraft. Unfortunately, those who talk of the various forms of combat power do not always make clear what particular classification they are using, and indeed often use all three.

One solution to the current confusion flowing from the independent consideration of the elements of combat power is to revert to the simplicity of the past by carving up air power into land and sea power components and doing away with the air force as a separate service, handing its assets to the army and the navy. Such an approach, while undoubtedly attractive to the generals and admirals, would do little to solve the still existent problem of how to best apply combat power, including that part that can be delivered by the aeroplane and related air vehicles.

Also, one of the many misconceptions that exist in relation to war is that the ultimate aim of war is (military) victory. Victory, which is essentially a military term, is merely a means to an end, that end being the attainment of the political objective that is at the heart of the war. On many occasions military victory will
indeed be the best means of attaining the political objective, but not invariably so. This focus on military victory in turn leads to an undue concentration on the need to, ultimately, defeat the enemy's armed forces on the field of battle, and in particular to defeat his army. This in turn leads to the idea that only armies can win wars and that, hence, the focus of the whole war effort must invariably be on the army and the land battle. All of this misses the point that there are other ways of using combat power to achieve the political objective of the war.

Rather than look at combat power as the sum of land, sea and air power, this article will attempt to develop a top down, composite view of combat power. In other words, rather than starting with a separate examination of land, sea and air power, this article will attempt to develop a view of combat power as a whole, as a basis for the development of a doctrine of combat power.

Combat Power

What is combat power? Combat power is an element of war, which in turn can be defined as being: a politically based conflict of interest, or policy, between two political groups, nations or alliances, involving the use of substantial military force, by both sides, against each other. Here, military force is synonymous with combat power. Thus, combat power is the power exercised by armed forces, normally, but not exclusively, against other armed forces in war. It is the power, or ability, of armed forces to inflict damage and destruction on others for the ultimate purpose of enforcing them to submit to the political will of the group, nation or alliance wielding the combat power.

The use of combat power is not an end in itself, it is used to put pressure on an adversary, to force his to submit to one's political will. It can operate in two ways. Firstly, it can be used to deny an adversary the control or use of land, sea or air space, and, secondly, it can be used to destroy military and civil facilities and infrastructure.

Denying an adversary the use of land, sea or air space can, in turn, operate at two levels: that of control, which involves being able to use a particular area for one's own military or civil purposes while at the same time denying its use to an adversary; and that of denial, which involves only preventing an adversary using an area for military or civil purposes without necessarily being able to use it oneself.

The control of ground, territory or land space is generally much simpler, at least in concept, than the control of sea or air space. The control of ground involves physical occupation, or sometimes domination from adjacent ground, of the area in question, on a continuous basis. Occupation of sea or air space is constrained by the limited ability of ships and, in particular, aircraft to maintain a continuous presence in anything but a relatively small area.

Control of land, sea or air space can be achieved by physical occupation with a force superior in combat power to that of one's adversary. Such superiority can be achieved by: building up one's own combat capability, or by destroying, or reducing, the combat capability of one's adversary.

The second means of applying pressure through combat power is by using it to destroy an adversary's military or civil facilities and infrastructure. Here the term 'facility and infrastructure' is used in its broad sense as covering the totality of his armed forces and their support as well as the civilian population and the social and economic infrastructure of the nation. The destruction of an adversary's facilities and infrastructure can be aimed at reducing his combat capability, either to facilitate the occupation or defence of land, sea or air space, or to protect one's own facilities; or to put direct, political, pressure on an adversary.

Offence and Defence

Combat power can be applied in offence, where it is used to gain control of an adversary's land, sea or air space, or to destroy his facilities and infrastructure. Or it can be applied in defence, where it is used to prevent an adversary gaining control of one's own land, sea or air space, or destroying one's own facilities and infrastructure. With regard to the control of land, sea or air space, offence is normally more difficult, and hence requires greater effort, than defence. For the destruction of facilities and infrastructure the balance is the other way around, it being generally much easier to destroy facilities, etc, than it is to prevent their damage or destruction.

The Force in Being

One use of combat power that involves neither control of space or destruction of facilities, etc is that of the force in being, of being able to exert pressure on an adversary by the mere possession of a significant
combat force. Such a force must be either clearly superior, or be of such power that the adversary is unwilling to enter into combat against it for either military or political reasons. The maintenance of peace by means of the deterrent is an example of the use of a force in being. In other circumstances it can be a factor in setting limits to the scope and extent of combat action in war.

Principles of War

Most texts on war and military combat list ten or so Principles of War as a guide to the conduct of combat operations. These principles cover such things as: the selection and maintenance of the aim, morale, offensive action, security, surprise, concentration of force, economy of effort, flexibility, co-operation and administration. The Principles of War could alternatively be labelled the Principles of Combat Power for they are central to any doctrine of combat power.

Due to their widespread consideration in many military texts the principles of war will not be further discussed in this introductory article on the doctrine of combat power.

Levels of War

Taking the classification of war into three levels, namely, strategic, operational and tactical, combat power is applied directly at the operational and tactical levels. Concern at the strategic level is with the circumstances and effect of combat power related to the political objective.

Technology

The impact of technology on warfare has been to greatly increase the amount of firepower available per combatant and to increase the ratio of support to combatant personnel. Only with land power is there still a tradeoff available between numbers and technology. With both sea and air power superior technology provides a clear advantage.

Comparative Military Strength

Going back in history, the strength of an army, and hence its combat power, was measured in numbers of fighting soldiers, although history also records that having superior numbers gives no guarantee of victory. Today, combat power is more often measured in terms of firepower, with numbers of divisions, tanks, guns, ships, submarines, aircraft and missiles, being added together in accordance with some complex formula. With nuclear warfare even more exotic measures, like for example, 'throw-weight', are used. Notwithstanding all of this, it remains a fact that success in combat has never been, or ever will be, entirely predictable, irrespective of the precision of measurement of comparative combat power.

All of this does not mean that judgments as to comparative combat power will not remain one of the more important considerations in war. However, to this measurement, which is in effect a measurement of comparative firepower, must be added a host of subjective and largely interrelated factors in order to come up with a realistic balance sheet of comparative military strength.

The first factor is mobility. Firepower is important, but it must be placed where it can be effective. Also, the all important factors of initiative and surprise, both strategic and tactical, are closely tied to mobility. A mobile force can advance and retreat at will and is much better placed to exploit fleeting opportunities.

Next comes what could be described as operational skills. This refers to the skill of the general (admiral, air marshal), his subordinate commanders and his soldiers (sailors, airmen) in the art of battle. Skill in deployment, manoeuvre, timing and employment of forces, and in exploiting the weaknesses of the enemy all add to the chances of success, and in reducing the likelihood of defeat. Good troops, well led are worth many times poor troops, poorly led.

Battle must not only be joined, it must be sustained. This in turn requires that the force’s logistic support be matched to the demands of the continuing battle. Logistics covers a whole range of requirements, not merely fuel and ammunition. It demands careful planning and adequate resources, and in the modern military force is likely to absorb far greater effort than the battle itself.

In combat, attack and defence are not equal. Greater strength is required for attack than for defence. While the attacker generally has the advantage of initiative as to the timing, the defender has the advantage as to the ground. It is the attacker who must risk exposure
rather than the defender. To win, an attacking side must have superior strength.

Behind the scenes of warfare there is a continual striving to improve weapon systems, and in particular to achieve the technological breakthrough that will provide, at least temporary, superiority through such things as greater firepower, increased mobility, improved defences or tactical surprise. A significant technological breakthrough can alter the comparative balance sheet and virtually guarantee victory. As Hilarie Belloc’s Captain Blood said: ‘Whatever happens, we have got/The Maxim gun, and they have not.’

Morale can have a major impact on an armed force’s fighting ability. A highly motivated soldier (sailor, airman) is worth many times more than one that has no heart for the conflict. Morale is affected both by the conditions at the battle front and the social support that the soldier receives from his home community.

The final factor that can affect the balance sheet is what might be called the socio-political factor, which includes the drive and dedication of the home population. An armed force in the field relies heavily on home base support for the quality and dedication of its members, the strength of its material support and, most importantly, the quality of its political leadership and their direction of the war. Victory in war is not necessarily dependent of military victory in the field, notwithstanding the prominent place given to it in war propaganda. War should not be seen as an end in itself; it is the subsequent peace that is all important.

Another aspect of the socio-political factor is that of the ruthlessness, or otherwise, of the political leadership. War is a brutal activity in which the more ruthless the political leadership, the more willing it is likely to be to sacrifice its own people and to rain devastation on its enemies, and hence the more effective will be its use of combat power. The humanity that is, in all other respects, a positive feature of liberal democracies, is a decided advantage when facing a ruthless adversary.

The factors set out are all largely subjective. Hence in assessing them we must be aware of the biases that we may apply. Here, exaggeration is the biggest danger. For example, and maybe all too often, we may regard the enemy as all being ten foot tall and our-
selves as pygmies; or, alternatively, unlike us, of being backward and incapable of handling technologically complex weapons.

The application of the factors of mobility, operational skills, logistics, attack and defence, technology, morale and the socio-political to firepower is not a process that lends itself to measurement. Each factor, taken alone and with all other things being equal, could prove decisive. But, as we all know other things are never equal. It is the total effect that tips the scales in combat, not one factor alone. In war and defence we must of necessity make judgments as to comparative combat power, ourselves verses the enemy, whoever he may be. In arriving at such a judgment we must take all relevant factors into account, not just those that appear easy to measure. We also need to appreciate the inaccuracies that may cloud our judgment so that we can also come up with an 'error factor' to be applied to our overall assessment of comparative strength.

The Components of Combat Power

The components of combat power, that is, land, sea and air power, each have their own unique contribution to make to the totality that is combat power, and their own, comparative strengths and weaknesses.

Land power is built around the central theme of the land battle and of soldiers fighting on the ground, supported by ground based weapon systems. It is exercised primarily by armies, with support from naval and air forces. It has as its prime aim the taking and occupying of ground or the defence of ground. The destructive force of land power is usually directed against other ground based military forces.

The exercise of land power exposes the greatest number of combat personnel to the risk, as compared with sea and air power. Land power also has the lowest ratio of fire power per combatant. It is, however, the only form of combat power that can occupy ground. Thus it is an essential element in any war situation where ground is in dispute.

Sea power is built around the central theme of the war at sea and the warship as a weapon of war. It is exercised primarily by navies but with air forces often having a strong supporting role. It is aimed at both the control, or denial, of areas of sea and the destruction of enemy naval and mercantile assets.

One of the unique features of sea space is that most of it is not sovereign territory. Rather, the majority is international waters and hence open to use by combatant and non-combatant nations alike. This sometimes simplifies, sometimes complicates the exercise of sea power.

Air power is built around the aeroplane as a weapon of war. It is exercised by both independent air forces and air forces organic to armies and navies. Its prime aim is destruction of facilities and infrastructure and can be applied both against the enemy's homeland and lines of supply, and in support of the land battle and the war at sea. It can also be concerned with the control or denial of both sea and air space.

While air power can achieve very high firepower per combatant and can bring down the heaviest destructive power on any given target, it is very expensive in terms of both capital and operating costs. This, together with the flexibility of air power, leads almost invariably to the situation that there will never in battle be sufficient air assets to meet all demands.

All three forms of combat power require secure land bases, the protection of which often becomes one of the main (military) objectives of the war. All forms of combat power can be involved in the process of protecting bases.

War is, in part, about the use of combat power, not about the separate use of land, sea and air power. Unfortunately, because the professional development of most military personnel is in one only of these three areas of combat power, military professionals tend to focus their attention on their own service and its combat role, leaving it to 'someone else' to look at 'the big picture'. This in turn leads to the situation of combat power being a battle for influence between land, sea and air power exponents, rather than a close integration of the three elements of combat power to ensure its best use in pursuit of the political aim.

As a military professional, how much do you know about combat power in its totality, as against land, sea or air power alone?
Return to Greece

Return to Greece is an Australian Defence Force Journal production highlighting the 50th Anniversary of the Australian Defence Force's participation in the Allied struggle of the Greek Campaign of World War II.

In 1941, Greece fought for survival against the might of Germany. The Greeks, aided by Australian, New Zealand and British forces fought to ward off the invasion of their homeland. Return to Greece tells of these battles and of the Allied evacuation.

Return to Greece revisits the sites of the battlefields through a selection of 50 water colours and drawings. The book takes the reader on a journey with the veterans of the Greek Campaign through the country where they fought valiantly with their Greek comrades in defence of democracy. It illustrates the pride and professionalism of today's Australian Defence Force personnel as they pay tribute to the memory of those who fought with such bravery and self sacrifice in the cause of freedom in the dark days of 1941.

This book will rekindle memories for those who took part in the campaign of 1941 and also for those who participated in the return pilgrimage in 1991.

Return to Greece is illustrated by Defence artist, Jeff Isaacs with text by Michael Tracey.

Return to Greece is available from the Australian Defence Force Journal at a cost of $20.00.
Leadership Training at RAAF College

By Squadron Leader Eric Nothard, RAAF

**Philosophy**

'Under the pressures of battle, which can be very high, the requirement to be led emerges strongly.'
(1) General Sir John Hackett 1984

Behind this statement is the underlying philosophy for leadership training. The RAAF College philosophy on leadership training is to provide the optimum conditions and the appropriate type of professional training that will produce junior officers who have the attitudes, skills and knowledge to develop into effective and competent leaders.

**The Aim of Leadership Training**

The aim of leadership training is to develop junior officers who will be able to use their leadership skills to complement their overall management duties. Essentially, as the basis for most duties is on how the RAAF functions in war these duties are much more difficult to perform in peacetime — a time where it is easy to lose sight of the real aim. Leadership training at RAAF College is therefore geared to accommodate both the war and peacetime situations.

**Leadership Studies**

How are leadership skills imparted? At RAAF College students are involved in extensive leadership training. There is a very sound and clear strategy for such training. Occupational analysis has determined the duties that a junior officer should be able to perform on the completion of the Junior Officer Initial Course. Senior management at Air Force Office, the respective Command Headquarters and RAAF College have determined the policy and a well considered training strategy has been developed. Adequate training time has been determined and a syllabus has been formulated. RAAF policy is therefore to use specialised training methods to create and stimulate awareness, establish understanding and develop leadership skills.

Particular importance is given to communication and leadership. Throughout their training students are given extensive instruction and practice in oral communication. They are taught that communication is vital to leadership and that communication skills will ultimately assist their success as a leader.

Students are initially taught the traditional theories of leadership. They are taught that the Army definition of 'leadership' (which the RAAF accepts) is 'the art of consistently influencing and directing people in tasks in such ways as to obtain their willing obedience, confidence, respect and loyal co-operation in the manner desired by the leader'. They are also taught that leadership is the people part of management.

To be an effective leader it is necessary to have the appropriate character (the MacQuarie Dictionary defines character as the aggregate of qualities that distinguishes one person or thing from another). RAAF College Junior Officer Initial Course students are taught character development to allow them to understand how their own character has developed and also of the steps they need to take to effect changes to their character. They are also made aware of what they can do to strengthen the characters of their subordinates. Students are taught that character, or in simple terms, their distinguishing personality traits, may help them to perform their duties as leaders.

Following on from character development students are taught the art of motivation, the development of good morale and esprit-de-corps. Studies on motivation include the theories of Maslow, Herzberg, McGregor and Rosen’s four factor model. Motivation is defined as 'the willingness of an individual to give his/her full support to a task'. Morale is defined as 'a state of mind, an attitude in the minds of individuals when they identify themselves with a group and accept group goals'. Students are advised that as leaders they will have a direct impact on motivation and morale. Their leadership skills (or lack of leadership skills) will be directly responsible for the motivation and morale of the subordinates. Similarly 'esprit-de-corps' is defined as 'a sense of pride in belonging to a unit'. Students are encouraged to foster 'esprit-de-corps' within the RAAF and especially within their own units. Student
leave RAAF College in the full knowledge of the importance of motivation, morale and esprit-de-corps.

As students progress through the Junior Officer Initial Course they are instructed on approaches to leadership. They are advised that the most successful leaders appear to have exceptional leadership qualities such as high motivation, courage, decisiveness, integrity, judgement, knowledge, loyalty, responsibility, selflessness, initiative and the ability to communicate effectively. Students are actively encouraged to develop such qualities with the aim of becoming more effective leaders. The 'qualities approach' is an approach where students are encouraged to emulate the more desirable attributes and/or traits of great leaders of the past in order to develop their own leadership capacities. Studies in the 'traditional situation approach' deal with the theory that the leader of any group will be the person who possesses the necessary skill or knowledge to deal with the situation or problem facing the group. Students are also taught that the 'functional approach' to leadership is based on the theory of group needs. That theory says that within any group that comes together to perform a task, various needs will arise. These are defined as the task, the group and the individual needs. In accomplishing a task using the 'functional approach' all of those needs will have to be considered and prioritised. Students are taught that in order to determine and prioritise the aforementioned needs they will need to plan, initiate, control, support, inform and evaluate (PICSIE) each task. PICSIE becomes the focal point for further leadership studies.

Discipline and how a leader uses discipline to ensure his subordinates achieve the optimum results is also taught at RAAF College. The responsibilities of leaders are outlined as follows:

a. The need to set and maintain high standards of discipline.
b. The maintenance of effective communications with his followers.
c. The fair and impartial enforcement of discipline.
d. To lead by example.

Students are taught that by setting the example a leader (covertly) asks much of his/her men and he/she usually gets it.

To broaden the outlook of our potential leaders, students are introduced to goal-setting problem solving and decision making. An understanding of these subjects not only adds to the competency of the leader but also increases the mutual respect within the organisation. Students are also trained in organisation skills. They are advised that organising is concerned with:

a. Determining the specific activities that are necessary to accomplish planned goals.
b. Grouping the activities into a logical pattern, framework or structure.
c. Assigning the activities to specific positions and people.

An important part of being a leader is the ability to plan activities. Students are advised of everything they need to consider when planning a task and they are also advised on how planning processes are applied in the execution of a task. They are then required to demonstrate the application of the planning process in the execution of a task — this task requires them to plan a field exercise in which they will be physically involved. Planning and organising theory is also tested during the students involvement in field exercises.

Students are also taught that in order to properly control and evaluate activities it is important that a leader knows:

a. what should be happening,
b. when it should be happening,
c. who should be doing it, and
d. how it should be done.

Directing Staff insist on such controls and evaluation and also stress that students, as potential leaders, need to know the value of planning and of the need to check and measure (evaluate) the process. As leaders they will have to set standards for their subordinates and ensure that these standards are being met. In order to ensure that standards are being met they may have to implement controls and, in order for these controls to be fully effective, an understanding of basic psychology and behavioural attitudes is necessary. Students are advised of the problems likely to be experienced in implementing controls.

Junior Officer Initial Course training students are constantly assessed (evaluated) against a ten critical requirements assessment scale. On every task they perform they are rated on a sliding scale of one to five (one is unacceptable and five is outstanding) on each of the following criteria:

a. assuming responsibility,
b. displaying initiative and decisiveness,
c. performance under stress,
d. correctly applying knowledge,
e. supporting and co-operating with others,
f. seeking and accepting advice,
g. preparation and planning,
h. communicating effectively,
i. directing others, and
j. creating high team performance and morale.

Also, as part of their personal development, students are given instruction on the Investment in Excellence (IIE) philosophy. The IIE philosophy is to discover and share insights, concepts, techniques and skills that will allow the greatest number of people to release and
LEADERSHIP TRAINING AT RAAF COLLEGE

Training in Leadership

Training in leadership commences as soon as recruits arrive at RAAF College. Students are inculcated with the need to achieve excellence in everything they do. Normally within three of four days after arrival students proceed on Exercise Discovery. Exercise Discovery is an executive training course of five days duration conducted in the rugged Grampians Mountain Range of Western Victoria. The course extends the personal horizons of students through adventure learning in order to develop a well organised, confident and self-reliant officer who can participate effectively as an efficient team member. Exercise Discovery does exactly that, students are required to live in the field, sleep in 'hootchies' and exist on ration packs.

They are introduced to rafting, canoeing, abseiling, mountaineering and navigation. For most recruits these activities are new and a true sense of adventure is a reality. Interspersed throughout the exercise are confidence and trust exercises designed to build up the personal confidence levels of students. After each days activities students are required to participate in 'feedback circles'. Feedback circles involve students being actively encouraged to delve into their personal make-up and explore their inner-self, assisted by others in the group who are allowed to make constructive criticism about them. Students reactions to the openness of this exercise are usually very positive, to quote one young player 'I didn't know that was how others saw me. I'd better change my ways'.

During Exercise Discovery staff follow the John Adair maxim that leadership cannot be taught only learned. Students learn by their own mistakes. For example, if any of the students pitch their 'hootchies' incorrectly they are not told there and then how to do it correctly. After a wet night in a bleak exercise area they will learn quickly enough to avoid repeating the experience.

At the end of Exercise Discovery it is very easy to see the team bonding and the establishment of 'esprit-de-corp'. A much more confident person emerges from Exercise Discovery (it has to be seen to be believed) and each participant is keen and eager to demonstrate their newly acquired leadership skills.

Shortly after students return from Exercise Discovery they are again deployed in the field on Exercise Pathfinder. This exercise, which is the real introduction to military skills, is of seven days duration and is conducted at the Puckapunyal Army base. At Puckapunyal students are taught basic weapon skills, fieldcraft, basic tactics, campcraft, bivouac and camp-site theory and practice, personal and field hygiene, survival in the field and more land navigation. The basics taught on Exercise Pathfinder are the forerunner to other field exercises in which students play and even greater role in leadership situations.

After the return from Exercise Pathfinder students are formally introduced to Command, Leadership and Management (COLM) training. During COLM the theory of leadership is taught and reinforced in the form of short (about half an hour each) practical exercises conducted at RAAF College known as the Leadership Reaction Course (LRC). The LRC is an opportunity for students to be given information, manpower and material in order to carry out the correct processes. Students must complete the task within certain time limits. Students are given the scenario and they are then working against the clock to complete the task. In achieving the mission they must consider the individual, the team and the task: feedback to the team is an essential part of their leadership role in this contrived situation. As the leader they have to be receptive to change and demonstrate the ability to respond positively to incidents that effect the efficient completion of the task. Students are purposely put under stress in order to test their ability to cope and to test their leadership skills. A thorough participative debrief is conducted by the Directing Staff after each 'leader' has completed his/her exercise to enable all of the group to learn from that leader's strengths and mistakes.

Approximately two weeks after the LRC students are required to participate in a two day Exercise, titled Exercise Stepping-Stone. conducted at RAAF Williams Point Cook Base. Exercise Stepping-Stone is a more advanced LRC where each task takes about two and a half hours to complete and where 'leaders' are required to move personnel and equipment over considerable distances. As a result of the extra time and large training area, the 'leader' has a more difficult task to perform than those in the initial LRC. Every student is required to perform as a leader at least once during the Exercise.

After LRC students are given more comprehensive training in COLM, Character Development, Investment in Excellence, RAAF Quality, Oral Communication and the normal military subjects such as the Defence Force Discipline Act, Drill and Ceremonial, General Service Knowledge, Military Indoctrination,
Military Operations, Ground Defence, Counter-Intelligence and Security, First Aid, Safety and Firefighting, Personnel Management and Administration, Physical Training and Written Communication. The sequencing of the subjects taught is vital and is planned to allow a progressive and integrated build up of knowledge. Such a training system produces students with a well balanced and broad-based all round knowledge of how the RAAF systems operates and of the role that they are expected to perform as junior officers. The course also allows the students to progressively build, use and test their leadership skills. However, as the amount of information and education increases so do the demands placed on the students; higher levels of performance are required as the course progresses.

In the eighth week students are again required to take part in a field exercise titled Exercise Columbus. Exercise Columbus, which is held in the rugged Wombat State Forest near Blackwood Victoria, is essentially a two day navigation exercise where students are again required to live in field conditions. They are required to carry out certain military type exercises such as building a bridge across a stream, recovering the debris of a crashed aircraft, erecting a radio antennae and several other tasks. They have to navigate, in all sorts of weather, through very steep, leech infested bush country as part of this exercise. Their navigational skills are well and truly tested. At all times during this exercise a Directing Staff member accompanies the various syndicates and the students are under constant assessment.

During week 11 students are required to take part in Exercise Paladin. Exercise Paladin, which is also conducted in the Wombat State Forest, is an exercise of 72 hours duration, in the field, where students are critically assessed on their leadership skills. Each course is divided into three syndicates, normally of eight students per syndicate, each person in the syndicate is required to lead the syndicate for a period of six hours minimum. The scenario for the exercise is the search for some children lost in a very dense area of the forest. Syndicate leaders are briefed on the situation and are then given specific tasks and told to perform certain duties using the manpower available in their respective syndicates. Such duties include cordoning, patrolling, search coordination, field support and leading search parties through some particularly rough terrain. To assist in completing their tasks, syndicate leaders may also use any other information they can glean from radio messages passed from the Exercise Controller or from other syndicates involved in the exercise. Again Directing Staff constantly assess and debrief the performance of each leader and the group in general. Should students fail Paladin they are given a remedial training and are given another opportunity to display their leadership skills. A second failure usually leads to suspension from training.

As outlined a large proportion of their training time is spent 'in the field' on carefully designed exercises which rudely awaken the unwary to expect the unexpected. The challenge, mixed with deliberate elements of risk gives the students a unique chance to test themselves and measure their own limitations and potential against tough odds.

At the end of Junior Officer Initial Course students have met all Course Training Objectives and are competent and able to perform capably as leaders. They have demonstrated their leadership ability, usually under difficult conditions, by leading a group in the successful completion of a task. RAAF College Junior Officer Initial Course training is geared to develop self-reliance, confidence and an awareness of a students true potential.

### Conclusion

In conclusion, the RAAF College strategy for developing and producing leaders is to provide extensive theoretical and practical training in all matters that will enhance the skills of potential leaders. Subjects are integrated and sequenced in order to present a structured, easy to understand and easy to use training system. Students are critically assessed on every activity at RAAF College and, when they graduate, they have proven ability as leaders and are in full possession of all of the relevant information and training that will assist them in their endeavours to become more effective leaders. Does it all work? We at RAAF College believe that it does; our graduates are living proof that leadership training works. Next time you meet a recent graduate take a few minutes to talk to that person about leadership, I'm sure you will be pleasantly surprised.

Squadron Leader Eric Notliard joined the RAAF in 1965 as an airman. He served as Drill Instructor, Airfield Defence Guard and as a Warrant Officer Disciplinary before being commissioned as an Administrative Officer in 1979. Since being commissioned, Squadron Leader Notliard has seen service in Headquarters Support Command (now LOGCOMD), Base Squadron Laverton, Officers Training School, Australian Defence Force Academy, Air Force Office and No 2 Aircraft Depot. He is currently serving as a Flight Commander at Officers Training School RAAF College.
At a time when many would expect the RAAF to be looking closely at a replacement strike aircraft, the F-111s is defying tradition and heading for a unique service record.

The first of up to 18 surplus USAF F-111s is expected to be delivered later this year — a purchase program which will virtually double the F-111 fleet. And for the RAAF's 22 existing aircraft, a $500 million Avionics Update Program (AUP) will provide state of the art flight and navigation systems which will maintain the F-111 as this region's most potent strike weapon.

In addition, the very latest computerised mission planning soon will be used by crews and an updated simulator is on the way.

By 2010, the F-111s will have been in service for an unmatched 40 years.

The AUP's three components are a new avionics suite for all 22 bombers, new automatic test equipment and the mission simulator.

The major avionics contract was won by Rockwell Electronics Australasia (REA), an Australian subsidiary of Rockwell International. The program development phase is being conducted at Rockwell's Anaheim (Los Angeles) facility.

Production will be managed in Australia by REA with Hawker de Havilland (Victoria) as the major subcontractor.

Currently being developed and tested in Anaheim (Los Angeles) is the latest computerised systems to replace the old analogue avionics. The RAAF's F-111 prototype is due for its first test flight at Palmdale outside LA in February, 1994.

"The RAAF is incorporating in one program what the USAF has or will be doing in four," RAAF project office head, WGCDR Bob Downing said.

"The principal areas we are modifying are the aircraft avionics — displays, computers, communication systems, terrain following and attack radars and the digital flight control system. And we are upgrading the aircraft stores management; that part is the avionics that controls the weapons and plays a part in the release of weapons."

"Also to be delivered under the program is a Weapons System Support Facility (WSSF) which essentially is a set of hardware and software development tools. That will allow us to support five Operational Flight Programs (OFP) which is the computer software that drives the plane."

Central to the WSSF is a Lab Integration Mockup (LIM) featuring an F-111 crew station and aircraft forward equipment bay.

The LIM eventually will be shipped back to Australia to assist with maintenance and future modifications.

Meantime, when all the F-111s are converted, one will have to look hard to notice the small, flat antennas to be positioned in front of the crew modules. These will be the only outward signs of the satellite-linked Global Positioning System (GPS).

Outside the USAF's 'Pacer Strike' F-111 upgrade, the RAAF fleet is the first to acquire this capability.

Rockwell test and integration group member, Seven Clark said the space shuttle had positioned most of a total 28 military GPS satellites for the USAF.

"They beam down a particular frequency. You will have three brought to the aircraft so you can triangulate from their exact positions, to figure out your position," Seven said. "It is very precise. It is the best positioning system we have."

Also at Anaheim, the project team is working to dramatically reduce the time needed by crews mission planning. The key here is mission data preparation equipment which will be handled by crews in the operations area.

Basically, the system allows crews to, on a computer screen, plan a mission to the finest detail. The computer quickly calculates aspects such as the effect of diminishing fuel loads, the varying weights of weapons loads and the distances to be flown.

Meantime, a small RAAF team is based at Harris Government Support Systems Division in Orlando, Florida, developing a computer controlled automatic system designed to pinpoint aircraft avionics faults as they arise.

The project's third element, the mission simulator, is a surplus USAF F-111F unit procured from the US Government. The simulator was recently upgraded with 80 percent new hardware and a contract for the reconfiguration and further upgrade will be let early this year.

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The Director-General Materiel — Air Force, AIRCDRE Ian Whisker described the project as a partial half-life refit. "If we were not to undertake this avionics update we would have been faced with problems in keeping the avionics of the F-111s going," he
A familiar sight in Australian skies during defence exercises — the RAAF F-111 is leading the way into the 21st century. Photo: Bill Cunneen

said. "This is in view of the fact the USAF is closing down some of the 111s which have similar systems to ours. The only ones they will keep operating will have gone through an avionics update, although slightly different (to ours)."

In the 20th century, 25-year periods have seen military aircraft come and go. Since the 1960s the revolutionary F-111 has proven to be a remarkable aeroplane and it now is on its way to remaining a fearsome attack weapon well into the 21st century.

Warwick Sheilds is a Public Affairs Officer with the Department of Defence in Canberra. His background is in journalism (print media), prior to joining the Department of Employment, Education and Training Public Relations Unit. He moved to Defence in 1991 as the Editor of RAAF News. Last year he began an information program to highlight the RAAF's F-111 Avionics Update Program.
A Letter to a Friend – The Strategy of the Indirect Response

By Colonel Jim Wood, Australian Army

My dear friend,

I apologise for my tardiness in writing to you. Like many of my colleagues I get caught up in the trivial and the immediate to the neglect of the important and the longer term.

You will be aware of the many changes being imposed upon us at this time when the pace of change itself is accelerating. Try as I do to adjust to these changes, even to influence them, I find my vision often blurred and my brain saturated by the blizzards of daily circumstances.

Of particular concern at the moment is our national obsessions with ‘expert’ opinion as to how we should properly defend this nation. You will know that we are, in the main, a derivative people, often imitative and sterile, dependent upon others for our ideas. Monotonously we belatedly pick up an idea, or a fad, discarded elsewhere yet we grasp it with the enthusiasm and blind loyalty of a teenage believer.

To this national predilection we have added recently a new touch, a dependence upon this or that local expert hired, at great expense, to do our thinking for us. During this process all other activity is suspended yet once the tablets are handed down they are seen as inviolable and remarkable. Moreover our sloth extends to our acceptance of the inexactitude in language written upon the tablets. We find it comfortable and convenient to accept what is written and thereby disguise our ignorance, discourage the doubters and dispel the concerns of those who look to us for professional guidance.

Thus it is we find the very lexicon of our profession in jeopardy. Important words like policy and strategy are used ambiguously and often trivialised. People now have policies for putting out their household garbage and strategies for cleaning their teeth. For my purposes policy means a decision by government to pursue a particular course of action; strategy means, in its military sense, the directive governing the operations of a nation’s military forces with regard to the implementation of a particular policy. For my purposes tactics are the methods used by a nation’s military forces when conducting operations. You will be outraged, I imagine, by my presumptions, knowing that such definitions are the very stuff of controversy.

Let me now add insult to injury. Since my earliest days my knowledge of the writings of Basil Liddell-Hart has been encapsulated in his Strategy of the Indirect Approach. I admit to an imperfect understanding of both the Strategy and Liddell-Hart’s more general work yet I find much value in the practice of seeking to extract from the past that which we might apply thoughtfully to the present. Suitably emboldened by a reluctance to embrace our present condition I have sought some release. I put it to you, without being imitative, I hope, that we need a fresh approach to the basic matters of our National Security. That we should strike out in a new direction, based on our own response to the unique situation in which we find ourselves. Certainly we should benefit by the experience of others but we should not be prisoners of it. How might we proceed? In order to distinguish between Policy and Strategy and as a basis for discussion I offer the following ideas.

Typically Australian National Security policy would hold that the resolution of international disputes by peaceful means is preferable to resolution by military means. The only cost in the pursuit of this resolution unacceptable to Australia is the loss of freedom or intrusion upon Australia’s national sovereignty. The determinants of such a policy are however various and variable, for example:

- that Australia would pursue and protect its national interests in conjunction with allies or likeminded governments;
- that Australia’s strategic situation is fixed and its national security resources are finite;
- that, in certain circumstances, Australia may have to act alone in defence of its interests; and
- in that event, the strategic circumstances are likely to be unfavourable to Australia and Australia placed at a critical disadvantage.

The policy would require that Australia use every means possible to resolve disputes peacefully. The threshold would be reached should the initiator escalate the dispute, fail to resolve it, or persevere with the application of military means. Should resolution not be possible and harm is caused or threatened to the freedom of Australians or intrusion upon Australian sovereignty occur, then the Australian Government would authorise additional steps, including the use of force, to redress the loss of freedom and or remove the intrusion. It would act decisively to put an end to the situation quickly and in such a way as deters a re-
occurrence of the situation. The Australian Government would authorise additional offensive action as would cause substantial harm to the initiator of the situation. If the initiator persists with a course of action that Australia is unable to contain or defeat, using such resources as are normally available in terms of peace, then Australia would declare a state of national security emergency, or of war, to exist between Australia and the initiator. Concurrently with the activation of appropriate national security measures specifically, the implementation of its mobilisation plan, Australia would persevere with all the options at its disposal to resolve the situation peacefully.

Whatever the timing, size and nature of the dispute Australia would adopt the Strategy of the Indirect Response. This strategy presupposes that an initiator of an action disadvantageous or hostile to Australian interests would evoke an indirect response disadvantageous to the initiator. Australia would usually eschew any response at the place of action, or by the means chosen by the initiator, but instead respond at a point where the initiator is most vulnerable and which would cause the initiator harm far in excess to that caused to Australia at the point chosen by the initiator. In the early stages of a dispute Australia would not resort normally to military means to respond to the initiator at the place of action chosen by the initiator.

In the event the situation deteriorates to the level that Australia is obliged to use military means then the Strategy of Indirect Response would have these features:

- That Australia have in place a statement of intent as to its preparedness to act forcefully, in times of peace or war, to protect the freedom of its citizens and its territorial integrity.
- Action against the initiator would be undertaken wherever and by whatever means thought appropriate and feasible by the Australian Government. Australia, when its national security is at risk, would not see itself as limited in terms of the means it would be prepared to employ.
- That action would be controlled and coordinated at the highest level of the Australian national security organisation, specifically an Australian National Security Council (ANSC), to ensure that the maximum benefit is derived from the minimum outlay of national effort. The Australian response would not necessarily be military and any tendency to under-react or over-react whether in magnitude or means would be resisted. Thus, for example, Australia might utilise a range of economic or commercial responses, i.e. as a major exporter of food, and raw materials, or as an importer of capital or goods.
- The area forward of the Australian mainland would be used as valuable space within which to purchase time and inflict damage upon any aggressor.
- That Australia is prepared, in a military situation to trade space and time for as long as is necessary to restore eventually its freedom and sovereignty.
- Australia would be prepared to give up temporarily any territory or resource beyond its capacity to hold militarily or by civil means or the defence of which would jeopardise the success of subsequent activities. Thus military action would be delayed until there is an acceptable prospect of success, and offensive action designed to cause maximum casualties to the enemy for minimum loss. Territory would only be relevant in so much as it aids this object. Certain areas or resources within Australian territory by their nature, would have a priority of significance to the overall national security plan.
- That the Strategy of the Indirect Response, once began, would encompass all Australian citizens and means in its execution.
- That Australia would seek, by whatever means are necessary, in the circumstances, to involve its allies and neighbours to Australia’s advantage.
- That military action under the Strategy in support of Australia’s allies or the UN would occur following an objective assessment as to whether or not such assistance would be advantageous in terms of Australia’s direct national interest.
- That Australia, under attack, would discriminate resilience in terms of its capacity to absorb damage and in the determination of its people to resist by whatever means are necessary in the circumstances. It follows that this Strategy could be expanded or contracted to suit Australian purposes.

What changes in attitude, organisation and practice could be necessary to give effect to these proposals? The long standing emphasis upon Defence Policy and reliance upon the Defence Force to give effect to the Policy would be broadened to a National Security Policy, the execution of which would involve a range of civil and military options given effect through the Strategy of the Indirect Response. A new organisation, the Australian National Security Council, chaired by the Minister for National Security, could be established to ensure a national approach to matters of national security, with regard to policy and strategy.

At the national level Australia would maintain a range of demonstrable military and civil options to give effect to the Strategy of the Indirect Response. It would expand its present Special Forces for the conduct of offensive and defensive operations of an overt and covert nature and establish a Special Operations Directorate, which in accordance with policies authorised by the ANSC, would undertake such planning
and preparations as are necessary to give effect to those policies. In this regard Australians would, in the worst case of having their homeland or part thereof overrun, resort to, and be prepared for, an extended guerilla war against the invader. Australia would also establish an Economic Warfare Directorate with parallel civil purposes and resources to those of the Special Operations Directorate.

It would establish an Australian Strategic Strike Force based on appropriate naval, ground and air units.

It would put in place a concept and operational plan for the prosecution of Australian interests which makes possible the maximum effectiveness of the courses decided upon.

To the maximum extent possible Australia’s military forces would be highly mobile and not tied to fixed bases. The long standing emphasis within the Australian Army upon footmounted infantry would be shifted to airmobile, mechanised or motorised combat forces. The long standing emphasis within the Air Force to operations from a limited number of bases would be shifted to operations from a wide range of locations. The long standing emphasis within the Navy upon single vessel activities would be shifted to multi vessel combat groups. The long standing emphasis upon a separate, vulnerable, civilian support base for the military forces would be shifted to a flexible, mobile support system. The long standing emphasis upon fixed command, control and support facilities would be replaced by mobile facilities, or, when this is not practicable, by well protected facilities.

Well, there you have it my friend. We live in troubled times. We are and will remain highly vulnerable to hostile action, whatever its nature and magnitude. We are obliged to find ways and means to reduce this vulnerability by originality, by the exploitation of our unique strategic circumstances and by a proven capacity to inflict unacceptable damage upon those who seek to do us harm.

What do you think?

Your old friend

Colonel Jim Wood is a regular contributor to the Australian Defence Force Journal. At the time of writing this article he was Project Officer, Command and Staff College, Queenscliff.

Australian Army signs Multi-Million Dollar Computer Deal

The Australian Army has signed a contract worth $23 million with NobelTech Australia Pty Ltd for the provision of computer hardware and software as part of the AUSTACCS project.

AUSTACCS is a computer-based command support system that will give commanders swift, detailed and accurate information about the battlefield while providing tools for analysis.

One such facility will be battlemap graphics which will give commanders and their staff a better picture of the tactical situation almost as it unfolds.

Delivery of the equipment will take place over the next three years. If all options are taken up by the Commonwealth the total cost of the project could be in the vicinity of $42 million.
Kokoda — The Lessons Remain Valid

By Michael O'Connor, Australian Defence Association

Soldiers returning to Australia in 1942 from the North African campaigns were inclined to look back with some nostalgia on that conflict. If a war had to be fought, the North African desert was as good a place as any. There were few if any civilians to get in the way, the terrain was generally flat with good visibility and, best of all for the infantryman, he travelled mostly by truck across the featureless plain.

So it was a nasty shock to be shipped to New Guinea to fight. Now, he had to walk into battle, if walking is a valid description for the heart-wrenching struggle up and down slippery mountain sides, through waist-deep swamps, slithering in the mud, drenched by rain which seemed eternal and, in the mountains, icy cold.

The mountain ridges seemed never-ending. For the soldiers, weighed down by weapons, ammunition and heavy packs, and struggling up the slopes, false crests raised false hopes which were dashed as yet another crest loomed overhead. Going down hill was, if anything, more difficult with slippery footholds tearing at knee and ankle joints.

The distances themselves were measured in hours or days rather than miles. Soldiers could see their destination across a valley but a distance that Greg Norman could handle with a good tee shot would take three hours or more on foot. Unless they were exceptionally fit, older men, those over about 35, were no match for the climate and terrain.

Then too, there was the Japanese soldier. In those early stages, he was frequently tough, fit, well-equipped and trained, and a veteran of many campaigns. The Japanese troops on the Kokoda Track were the First Eleven.

The biggest enemy, though, was the smallest — the mosquito. Together with the bush mite, the mosquito brought malaria, dengue fever and scrub typhus that almost destroyed whole battalions and left the survivors with a legacy of disease which remained for years. For every single battle casualty, the mosquito killed or crippled dozens of soldiers.

Only a lunatic would willingly fight a war in New Guinea. Unfortunately, military necessity rarely permits a choice of the most suitable ground, and the reality is that both the Allies and the Japanese were forced to fight in New Guinea in 1942 because of the strategic realities. Those realities were driven by an unchanging geography which is just as relevant to Australia today as it was 50 years ago.

Very early in the Pacific war, both the Americans and Japanese saw Australia as a key factor in their respective strategies. The Americans, especially the army and army air force, saw Australia as the base from which the war would be carried back to the Philippines and ultimately to Japan. The Japanese were equally concerned that such a base should be neutralised because it threatened their control of the Indonesian archipelago and its oil wells.

The Japanese Navy wanted Australia invaded and occupied. The Army considered the task beyond Japan’s capability. Their compromise was to push down the Solomons/New Hebrides (Vanuatu) chain and interdict the sea lines of communication along which flowed the critical supplies of men and equipment from the United States to Australia. The second part was to capture Port Moresby with its potential airfield sites as a base to defend Rabaul and for harassing raids on American air bases in North Queensland.

The first Japanese attempt to capture Port Moresby was foiled at the Battle of the Coral Sea. The Japanese invasion fleet turned back after their failure to sink the American carriers or the Australian blocking force.

As a result of good intelligence, the Allies had a clear idea of the importance attributed by the Japanese to Port Moresby. But doing something about it was another matter.

When the Pacific war erupted, there were two Australian armies. Apart from those under training or awaiting embarkation, the volunteer AIF, 152,000 strong, was serving overseas, mainly in the Middle East. Of the conscript home army of 213,000, fewer than half were serving full-time because there was insufficient equipment for the rest. Even fully manned units lacked transport or modern weapons, as did both the navy and RAAF.

More importantly, the 1903 Defence Act forbade the use of the conscript troops in an overseas conflict. Although New Guinea was under Australian control and protection, the Defence Act defined war as ‘a period of actual or apprehended enemy invasion of, or attack on, Australia’, thereby excluding New Guinea. Even today, that very restrictive and strategically inadequate definition is still enshrined in the Act, providing a curb on today’s generation of defence planners.
To overcome the problem, the Curtin Government sought volunteers from the conscript militia for service in New Guinea. By January 1942, a militia brigade, the 30th, had been deployed to Port Moresby but still lacked basic equipment. Most of the men were very young and a levelling of experienced AIF officers and NCOs did their best to improve what were very ordinary levels of training. Too many were used for labouring tasks on Port Moresby’s single wharf or in building fixed defences at the expense of field training.

From their new base at Rabaul, Japanese air raids on Port Moresby commenced in February 1942 and it was not until 21st March that a single, reasonably modern RAAF fighter squadron arrived. Committed to both the air defence of Port Moresby and attacks on the Japanese who were extending their control over New Guinea’s north coast, Squadron Leader John Jackson’s 75 Squadron would be slowly worn down through attrition of aircraft and exhaustion of pilots.

The Coral Sea battle not only removed fears of an impending invasion of Australia but focussed on Port Moresby. A further militia brigade was sent to Port Moresby and another, the 7th, to Milne Bay at the eastern tip of the Papuan mainland. AIF brigades from the veteran 7th Division would follow in August.

With more troops in Moresby and well-founded fears of a Japanese attempt to attack overland, the Australian command decided to place a garrison on the north coast of Papua around Buna. The 39th (Militia) Battalion was told to begin the march across the track to Kokoda, not the only way across the forbidding Owen Stanley Range but certainly the shortest. But the Japanese were to beat them to Buna.

The Kokoda Track at that time was nothing more than a foot pad. In the New Guinea tradition, it connected villages which, for defensive reasons, were normally sited on high ground. The track took the shortest way — down into the valley, across icy cold mountain torrents and up to the next village on a high ridge. Then the cycle began again. The pre-war Papuan Administration report on the track held that white men could not carry loads; ‘natives’ should be limited to 15 pounds (7kg).

The Owen Stanley ridges are steep. The highest peaks are 4,000 metres or more although the highest point on the track itself was little more than 2,000 metres above sea level. At these heights, the days are pleasantly cool, the nights bitterly cold especially for men sharing one blanket between two. In the wet season — when most of the mountain campaign was fought — persistent rain and low cloud not only made the going harder but cut air support.

Contemporary photographs only hint at the most basic of tactical problems for the troops. The undergrowth is so thick that visibility is limited to a few metres at best, often much less. Even the veterans among the Australians took time to adapt and to cope with the Japanese tactic of infiltrating around Australian positions, cutting off their line of retreat or reinforcement. Ultimately, both the militia units and the AIF veterans returning from the Middle East would learn the lesson and beat the Japanese at their own game.

The overriding problems, however, was that most basic of modern warfare — logistics, the vital and demanding task of providing the fighting troops with the means to do their job. Unlike their American allies, the Australians had, perhaps understandably, paid relatively little attention to logistics. Throughout most of their combat experience, the Australian army’s logistics had been managed by the British in overseas theatres of war. In peacetime, little attention had been paid to the problem as the commanders struggled with minuscule budgets and a comfortable assumption that, come the day, Australian improvisation and British largesse would overcome all problems.

On the Kokoda Track, there were no British, nor were there any trafficable roads. Until the RAAF and US Army Air Force solved the problem of air-dropping supplies in the unpredictable flying conditions, and acquired sufficient aircraft for the task, all supplies had to be carried on the backs of the hardpressed Papuan carriers.

These men, conscripted and controlled by Papuan Administration patrol officers turned soldiers, were the lifeline for the troops struggling against an enemy superior in numbers and weapons. They carried in everything from boots, blankets, bullets and bully beef to the thin trickle of medical supplies for the overworked doctors. And they carried out many of the wounded, eight carriers to each stretcher. So few were the carriers and so many the sick and wounded that many had to walk or crawl their way back to the roadhead outside Port Moresby.

Meanwhile, a Japanese attempt to capture Milne Bay at the end of August had been smashed by the two Australian brigades and RAAF Kittyhawk squadrons stationed there as a result of no little foresight by the Australian command. In one sense the Milne Bay battle was as important a turning point as the Battle of Midway had been at sea. From Guadalcanal in the east through the Kokoda Track to the India-Burma border in the west, it disproved the myth of Japanese invincibility on land.

Ultimately, the Japanese who faced the same logistics problem as their opponents, outran their supply line. By the end of September, unable to break the Australian resistance, they began to withdraw back
across the mountains. Facing the same problems of cold, hunger and disease, they would be forced back to their strongholds on the north coast at Buna and Gona where they would be destroyed in the most bitter battles of the New Guinea campaign.

Fifty years later, Papua New Guinea is an independent nation responsible for its own defence. But Australia cannot be indifferent to security developments in that country particularly because Papua New Guinea is too weak militarily to assure its own security in most circumstances.

In 1942, Japan's heaviest bombers could carry no more than 1000 kg of bombs. But with a combat radius up to 1,500 km from Port Moresby, they could attack Australian targets as far south as Rockhampton, albeit with that relatively insignificant bomb load.

By comparison, a modern fighter-bomber such as the RAAF's F-111Cs can carry a much heavier load — up to 10,000 kg — and attack targets almost as far south. With air-to-air refuelling, that radius of action can be extended much further. And, of course, there are many more high value targets in Queensland now compared with 1942.

The unchanging reality of geography is that Australia's shield is the chain of islands extending from Indonesia through Papua New Guinea to New Zealand. Australia has a vital security interest in doing whatever it can to keep those countries in friendly hands. If that means contributing to their defence against external aggression, that is a more realistic strategic policy than waiting for attacks on mainland Australia.

Such a policy also suggests that the definition of war inserted in the 1903 Defence Act when Australia's independence was severely constrained and when national defence was seen as an integral part of Empire defence is now seriously obsolete. Under the existing law, Australia cannot mobilise its power to defend an existing and key strategic position. Although world developments offer substantial hope that the relatively short era of all-out war may be finished, the fact remains that, legally, Australia as a nation is committed to surrendering all its strategic assets except the last ditch. At best, this is a primitive concept of strategy.

Michael O'Connor served in 15 NS Bn and MUR in 1956-57 before being granted leave to take up a nine year appointment as a patrol officer in Papua New Guinea. Subsequently, he transferred to the RANR and carried out full-time duty in the Naval Intelligence Division. Since 1981, he has been national executive director of the Australia Defence Association.
The 18th Brigade AIF at Buna
— Australia’s Pacific Battle of the Somme, January 1943

By A.L. Grame-Evans, Association Historian,
12th Battalion Association

The Lottery that is History

One must accept that the realities of life, and how they may be recorded for posterity, may differ. It is all in the luck of the draw. On occasion great feats of endeavour, may pass by to be hardly noticed, and yet lesser deeds (in terms of actual battle casualties sustained), may receive great prominence.

Many Australians would not be aware that the stretch of coastline and the hinterland behind, which commences with Cape Endaiadere, and proceeds past Strip Point, Giropa Point, Buna, Giruwa, Sanananda Point, and thence to Cape Killerton, on the north-east coast of Papua New Guinea, caused more battle casualties to just one Australian Brigade (the Immortal 18th) in one month, than the combined casualties of the three other Australian infantry brigades who over a three month period pursued the retreating Japanese back down the Kokoda Trail.

Thus there are few alive today, who would appreciate the enormity of the achievement (and the sheer courage and fortitude of the men) of the 18th Brigade AIF during that critical period in the Buna-Sanananda area between the 18th December 1942 — 21st January 1943.

They took by storm, with the expeditious assistance of what artillery and light armoured tanks were available, an extensive Japanese bunker system which was more reminiscent of the First World War than the Second, and it cost them in the three week period of the 17th December to 5th January alone some 870 battle casualties: a veritable Pacific Battle of the Somme.

Tragically, it was because the Brigade had been so effective in its task (the American 32nd Division having had achieved nothing of consequence in the six weeks prior, apart from a crisis in morale and astronomical medical casualties), that our Australian General in Command of New Guinea, General Blamey, gave the Immortals of the 18th Brigade no respite. He simply ignored his earlier promise that after Buna there would be ‘Australian Home Leave’, and sent the men back once more into the gloom of the jungle, and so slosh through the swamps in pursuit of the enemy, with many combatants delirious with malaria.

This new battle-line for the battle weary 18th Brigade, was inland at a jungle road-block across a dimply lighted track that wound its way back to the coast to a place called Sanananda. By the 14th of January their patrols had determined that the Japanese were in retreat and once more they were ordered to follow. The fighting was treacherous wearing and sharp along the track, with evidence of cannibalism along the way. Through the fetid swamps went these men of the AIF, determined to reach their objective as ordered: the black sand beaches of Sanananda.

Constantly soaked by the swamps, ragged in clothing with monstrous boils and a variety of jungle sicknesses, the men were superhuman in their endeavours. As a consequence infantry company size groups of men of a hundred or more of the 2/12th Battalion which led the advance, were down to but seven or eight men when seven days later they reached the coastal beaches at the end of the forced march.

The feet of these worn out survivors were so cracked from water immersion, that once their boots came off they were temporarily crippled and could not get their boots back on. In the course of their advance to charge the enemy’s well entrenched machine-gun housed bunkers.

The result of that day’s activities, despite the valiant efforts of supporting arms, some 63 infantrymen were killed and 122 wounded. At the commencement of the advance when the men were most exposed, some eighty-eight men were either killed or wounded in the first half-hour.
through the swamps to the coast, there had been on most occasions no dry land on which to rest and keep watch at night for enemy infiltrators. With electric storms above them, men were forced to lie for most of those nights pronto in the swampy mire often alive with maggots from the dead enemy abandoned along the way. On at least one occasion during a fierce electric storm lightning strikes struck nearby stumps sending electric shocks through the water and the shock was so great that it actually lifted men out of the water.

Yes, 50 years on we need to remember these men and what they endured.

It is a great pity that the defence planners after the war were not imbued with a sense of history, so that an active CMF brigade was specifically designated to be the 18th successor.

I believe no more just epitaph has been written to pay tribute to the men who died at Buna and Sanananda than that as published in the wartime publication entitled Khaki and Green:

"It must not be though that victory was won by other than hard, sustained fighting. The record of the 18th Australian Infantry Brigade, 2/9th, 2/10th and 2/12th Battalions is typical of other Brigades. The Buna and Sanananda fronts had been relatively static, but the arrival of the brigade inserted such an impetus to the attack and unleashed such pressure that the enemy resistance was crushed.

In five weeks continuous fighting in swampy and fetid jungle this brigade lost ninety-six per cent of its strength through sickness, hardship and battle, absorbed one thousand reinforcements, and maintained continuous offensive power culminating in the brilliant capture of Sanananda.

To achieve such results after losing practically one hundred per cent of its original strength is a record worthy of both the First and the Second A.I.F. and one unsurpassed in the annals of war".

In my considered view it was a magnificent feat of arms, which on a scale of dedication and discipline must rank (alongsides the 18th Brigade's earlier achievement as being the avenging vanguard at the Battle of Milne Bay) as being equal in stature to that of the British Light Horse at Balaklava in the Crimean War, or the Charge of the Australian 3rd Light Horse at Beersheba, in the First World War.

Many courageous young men who were the flower of Australia's youth passed away in this relatively short and very bloody successful close to the First New Guinea Campaign. I therefore ask all who read this, to think of them symbolically on New Year's Day 1993, as we have a quiet and comforting time with those near and dear to us, be it at the beach, beside a barbeque, or simply taking it easy at home.

Lest we forget these brave young men, who fate decreed were to fall in the service of their country on foreign soil.

**Book Reviews**

**ON ULTRA ACTIVE SERVICE** by Geoffrey Ballard

Reviewed by Lieutenant Commander Wayne Gobert

Geoffrey Ballard's book *On Ultra Active Service: The Story of Australia's Signals Intelligence Operations During World War II*, has made an important contribution to the history of Australian Signals Intelligence (SIGINT).

Ballard traces his own career in the 2nd AIF from 1940 to 1945, and as a part of this autobiographical journey, he outlines the development of Army SIGINT. The book opens with the primitive beginnings of Army SIGINT, in 4 Special Wireless Section in Greece, and concludes in The Pacific in 1945, describing the operations of MacArthur's SIGINT agency, The Central Bureau (CCB).

*On Ultra Active Service*, is first and foremost a personal recollection, and should not be approached as an academic reference book. One senses that Ballard set out to produce a chronicle of events, rather than a textbook, and once the reader adjusts to this approach, the story is readable and interesting. It weaves a pattern of SIGINT operations, intertwined with cultural observations, geography, and reminisces. In essence the human side of the conflict is emphasised.

The journey begins in June 1940, when 4 Special Wireless Group was formed in Seymour, with the purpose of intercepting enemy radio communications. The unit was noted as a strange collection, in which "upper age limits will not necessarily apply". Conceived by
the Director of Military Intelligence, Colonel Rogers, and headed by Captain Jack Ryan, it was manned by former radio men and merchant marine officers. Ballard joined the unit in Greece in 1941, just in time for the ill-equipped unit to be chased from Greece, to Crete, and ultimately to Egypt, in the face of the Axis onslaught.

4 Special Wireless Group would re-equip, and serve in the Syrian campaign, monitoring Axis air, and land communications. In late 1941, Ballard and his colleagues began learning Kana, the Japanese “alphabet”, sensing that it may soon be needed. On December 7, 1941, their prescience was rewarded.

When 4 Special Wireless Group returned to Australia in early 1942, they were propelled into the confused environment of a nation fearing the worst, and a collection of intelligence agencies evicted from Asia. In April 1942, Douglas MacArthur was appointed Commander South West Pacific Area (SWPA), one of his first acts was to create the Allied Intelligence Bureau (AIB) to centralise intelligence, and the Central Cryptographic Bureau (CCB) for SIGINT. Army SIGINT blossomed.

Ballard describes his command of 51 Special Wireless Section in Darwin, and was at the forefront of operations against Japanese air codes. Later he was appointed CCB liaison officer to GHQSWPA, and would ultimately serve in Manila, preparing for the invasion of Japan. His experiences provide a useful background to study of the SIGINT war, and the interplay between GHQSWPA and the CCB. His chapters explaining the units, and organisation of the CCB’s various sub-units are invaluable. He also provides some insights into what codes and ciphers were targeted by the CCB, and highlights the contribution SIGINT made to several Pacific actions.

However, the book’s title is somewhat misleading. On Ultra Active Service, is a worthwhile addition to the library of any SIGINT, or intelligence reader. It is easily read, and if one accepts that it is an autobiography, rather than a research paper, its contribution is obvious. Ballard has helped fill some gaps in the Australian SIGINT mosaic, by making the Army’s SIGINT role clearer.


Reviewed by Lieutenant Colonel R.E. Bradford

It has been argued that two critical errors cost the Axis powers victory in World War II. The first was Hitler’s decision to invade Russia which unleashed the awesome manpower strength of that nation. The second error was the Japanese assault on Pearl Harbor, which caused the United States not only to enter the War, but also to rapidly develop her industrial potential. From that point on the War was lost to the Axis powers, only the duration remained uncertain.

As can be seen from the title, this book is a history of the United States’ contribution to the Allied victory in World War II. In a series of short succinct chapters, Maddox covers the various theatres in a crisp yet readable style common to many scholarly historical works. His position as at Pennsylvania State University where he teaches courses on World War II obviously assisted him in adopting this approach.

I do not feel, however, that the book is suited to the dedicated reader of military history. It appears to be pitched at the high school, possibly university student, who requires a general knowledge book on the United States involvement in the War. Maddox appears to assume no knowledge of the conflict by the reader which at times further accentuates his school-like approach. Despite being readable and accurate (at least from an United States perspective), I found that the work did not approach the War from any new perspective, but simply recovered previously well worn territory. As such, it fell well short of my expectations.

"PRISONERS OF WAR" — From Gallipoli to Korea by Patsy Adam-Smith. Published by Viking, P.O. Box 257, Ringwood Vic 3134. RRP $45.

Reviewed by Colonel John Buckley, OBE, ED

What a remarkable person is Patsy Adam-Smith. In spite of bouts of serious illness — she is currently
recovering from another major heart surgery — she has continued to research and write best sellers at frequent intervals, having nearly thirty to her credit. One of our best known and best loved authors revered by the ex-service community, when present at an RSL function, she becomes the centre of interest. Everyone wants to talk to her — a good listener, one who can trade experiences and find common grounds with most, hence the depth and understanding of her research.

*Prisoners Of War* is superbly researched through interviews with hosts of former P.O.W.'s and their relatives. In many cases, the author also accompanied them on return visits to former P.O.W. camps in countries where Australian servicemen fought and suffered and were imprisoned.

Captivity in the jungle, snow, desert, on normal land or water, resulted in the horrors of bondage including starvation, ill-treatment and persecution. It took great courage, perseverance, suffering and pain for the prisoners who were determined to survive to rejoin loved ones in Australia.

Patsy introduces some of the most outstanding ex-servicemen and women whose courage, compassion and strength almost defy credibility. It is not intended to name any of them in this review because to single out a few would not do justice to the others.

In the author's own words "the men and women in this book were chosen to represent all, to give a sample fo what made a prisoner, cheered or dismayed him, crippled or ennobled him. The book is not written for ex-prisoners: they know the home sickness of exile, the tyranny of bondage; it was written for people of today who know little (and that often incorrect) of the experiences of these men and women; their courage, endurance and pain. It has been written for generations to come".

Everything about this book is outstanding — its narrative, done with great sensitivity and understanding; its photographs, which are most descriptive and appropriate; the high quality publication. As with all of her books, there is no speculation, exaggeration or doubtful incidents in order to sell the product — Patsy Adam-Smith's integrity is of the highest standard.

I commend this book to all — so very, very sad in places but so uplifting in others — with the earnest hope that the present and future generations read and understand this outstanding contribution to Australian history.