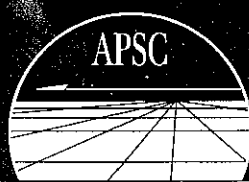


Strategic Air Power Doctrine for Small Air Forces



Squadron Leader S.A. Mackenzie RNZAF

Published by
Air Power Studies Centre
RAAF Base Fairbairn
Canberra, 1994



Air Power Studies Centre

Alan Stephens

RAAF Air Power Studies Centre

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ABSTRACT

This paper examines strategic aspects of air power doctrine within the context of a small air force. A small air force is one that because of its limitations must choose not to conduct some part of the complete air power spectrum. This paper is written in two parts. Part One is focussed on the essence and purpose of doctrine. It develops strategic air power doctrine through an understanding of the air environment and the characteristics and structure of air power itself. Part Two is devoted to issues that relate to the legal, moral and political environment within which strategic air power doctrine is applied.

ABOUT THE AUTHOR

Squadron Leader Stuart Mackenzie joined the Royal New Zealand Air Force in 1977. His career to date has involved fast jet and flying training appointments, and includes flying RNZAF Skyhawk aircraft from Royal Australian Navy Air Station Nowra in support of the Australian Defence Force. Squadron Leader Mackenzie graduated from the Royal Australian Air Force Staff College in 1992, and in 1993 was the first foreign officer to work on the staff of the RAAF Air Power Studies Centre. He returns to New Zealand in 1994 to assume command of No. 14 Squadron.

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It is important that I acknowledge the use of both the Royal New Zealand Air Force and Royal Australian Air Force air power doctrine publications, as extensive use has been made of material from both sources. Ideas derived from the doctrine manuals of the Royal Air Force and the United States Air Force are also incorporated into this paper.

Particular acknowledgment must be made of the support and encouragement I received from the Royal Australian Air Force Air Power Studies Centre, and in particular from Group Captain G.W. Waters and Dr A.W. Stephens, both of whom surrendered their valuable time to act as sounding boards.

GLOSSARY

Words and phrases that are not in common usage are listed here with a brief explanation of the meaning they have in this paper. This meaning may, on occasion, differ slightly from that found in official defence publications.

Air Power. Air power is the projection of force for a military purpose utilising a platform sustained in the third dimension. The platform may be manned or unmanned, and either military or civilian in origin.

Air Support Campaign. The air support campaign is that air campaign designed to directly complement the projection of combat power on land, sea and in the air. This campaign also extends to operations short of war, such as peacekeeping, disaster relief and humanitarian aid.

Air Strike Campaign. The air strike campaign is the air campaign designed to carry the air war to the enemy in the battle area and in his homeland independent of friendly surface forces. This campaign is primarily strategic air attacks made against enemy war-making capacity, infrastructure and national interests.

Air-to-Air Refuelling. Air-to-air refuelling is the refuelling of one airborne platform by another.

Airborne Early Warning and Control. Airborne early warning and control utilises airborne detection and command systems to detect the enemy and coordinate friendly air activity to best effect.

Airlift. Airlift is the transport of manpower and materiel by air.

Airmindedness. Airmindedness is a mind-set, or frame of reference, in which military doctrine and thinking are transposed into the three dimensional environment of air power, as opposed to the two dimensional environment of surface forces.

Anti-Radiation Missile. An anti-radiation missile is an air-to-surface missile which homes on the electromagnetic energy emitted by surface-based radar.

Anti-Submarine Warfare. Anti-submarine warfare involves offensive and defensive operations designed to neutralise, disrupt, or threaten enemy submarine activity.

Anti-Surface Warfare. Anti-surface warfare involves joint air/surface operations designed to defeat enemy surface combatants and other forms of shipping, that are in such proximity to friendly vessels that coordination is required.

Battlestaff. A battlestaff is a staff of ideally between six and eight experienced officers who support the Component Commander at the operational level of war. The battlestaff are primarily responsible for formulating the campaign plan for their specific environment.

Campaign. A campaign is a series of military operations within a definite area, or with one specific objective. An organised course of military action.

Centre of Gravity. Centres of gravity are elements of a nation or military force that are vital to continuing and effective operation. These central elements provide the strength and balance to an armed force or a nation. Disproportionate havoc will be created if these centres of gravity are destroyed, damaged or lost.

Close Air Support. Close air support is the application of air power in such proximity to friendly ground forces that close liaison is necessary to avoid unduly endangering those forces. This form of air power is requested by surface forces at crucial points in both attack and defence, in order to create opportunities that surface elements alone cannot achieve.

Combined. Combined activities, operations or organisations are those in which the forces of two or more allies participate.

Command. Command is the authority vested in an individual of the armed forces for the direction, coordination and control of military forces.

Control of the Air. The control of the air campaign is that air campaign pursued for the purpose of gaining freedom of action in the air.

Defensive Counter Air. Defensive counter air is the protection of assets from air attack through both active and passive defence, and the destruction of the enemy's air attack capability in the air in a defensive context.

Doctrine. Doctrine is what we believe is the best way to do something, having considered our experiences and those of others. In an air power sense, doctrine is 'what we believe to be true about air power and the best way to operate an air force'. Doctrine is authoritative but requires judgment in application.

Electronic Warfare. Electronic warfare is military action which exploits the electromagnetic spectrum. It encompasses the interception and identification of electromagnetic emissions, the employment of electromagnetic energy to reduce or prevent hostile use of the electromagnetic spectrum and actions to ensure its effective use by friendly forces.

Interdiction. Interdiction is the air role designed to restrict enemy manpower and war fighting materiel from moving into, within, or out of the battle area. Air interdiction can be conducted against land, sea and air targets.

Joint. Joint activities, operations and organisations are those in which elements of more than one service of the same nation participate.

Mass. Achieving military mass is the concept of concentrating the appropriate means, at the critical time and place, to the maximum degree permitted by the situation.

Offensive Counter Air. Offensive counter air is the air role mounted to destroy, disrupt or limit enemy air power as close to its source as possible.

Operational. Operational means occurring at, or derived from the operational level of war.

Rules of Engagement. Rules of engagement are directions which set the conditions under which elements of an armed force would initiate or continue a combat engagement. The rules define the degree and the manner of force which may be applied and specify the limits within which a commander can act.

Small Air Force. A small air force is one that for some reason, such as economic, geographic, political or social, will have chosen not to conduct some element or part of the complete air power spectrum.

Strategic. Strategic means occurring at, or derived from the strategic level of war.

Strategic Strike. An air attack against an enemy target of strategic importance, normally a centre of gravity.

Strategy. A strategy is a generalised plan of action to achieve a specific objective.

Suppression of Enemy Air Defences. Suppression of enemy air defences is that activity which neutralises, destroys or temporarily degrades enemy air defence in a specific area by physical attack and/or electronic warfare.

Tactical. Tactical means pertaining to tactics, or occurring at the tactical level of war.

ACRONYMS AND ABBREVIATIONS

AAP	Australian Air Publication (RAAF)
AAR	Air-to-Air Refuelling
ADFP	Australian Defence Force Publication
AEW&C	Airborne Early Warning and Control
AFB	Air Force Base
AFM	Air Force Manual
AP	Air Publication (RAF)
APSC	Air Power Studies Centre
ARM	Anti-Radiation Missile
ASW	Anti-Submarine Warfare
ASuW	Anti-Surface Warfare
CAIRS	Close Air Support
C3I	Command, Control, Communications and Intelligence
DCA	Defensive Counter Air
EW	Electronic Warfare
FGA	Fighter Ground Attack
JFC	Joint Force Commander
LOAC	Law of Armed Conflict
OCA	Offensive Counter Air
PGM	Precision Guided Munition
RAAF	Royal Australian Air Force
RAF	Royal Air Force
RNZAF	Royal New Zealand Air Force
ROE	Rules of Engagement
SEAD	Suppression of Enemy Air Defences
SNCO	Senior Non-Commissioned Officer
USAF	United States Air Force
UN	United Nations

PART ONE

CHAPTER 1

SMALL AIR FORCES

We cannot make war as we ought; only as we can.

Lord Kitchener.

INTRODUCTION

1. The above quotation is all too often true with respect to air power. Few air forces are in a position to apply their air power doctrine without compromise, and fight a war the way they know they should. Most air forces must reach a balance between what they know they should do, and what they can do.
2. The precise definition of a term often leads to more argument than the term itself. Attempting to define a small air force is one such case. For the purpose of this paper, a precise definition is not required. Let it be that a small air force is one that, for some fundamental reason, such as economic, geographic, political or social, will have chosen not to conduct some element or part of the complete air power spectrum.
3. Sound fundamental doctrine is essential for a small air force because of the compromises that must be made. A small force must make every person, every dollar and every mission count for more. To this end, the understanding and application of doctrine in small air forces must be more rigorous than that for larger forces. Whereas a larger force can sometimes use force structure and size to disguise flaws, a small force does not have this luxury.
4. Air power is a concept that remains largely ethereal in nature until one reaches the tactical level where aircraft and personnel become central. In 'Strategic Air Power Doctrine for Small Air Forces', diagrams have been used to add shape and substance to the conceptual issues in an attempt to make them easier to visualise and remember.

AIM

5. The aim of this paper is twofold. The first aim is to examine strategic level air power doctrine in the context of a small air force. The paper is structured to lead progressively through a series of topics that form the basis of generic air power doctrine. These issues are not a rigid set of rules, but rather a form of guidance which requires individual interpretation.

6. The second aim of this paper is to introduce the reader to generic air power doctrine principles, and to emphasise the importance of continuing doctrine education. All airmen have the responsibility to articulate the consequences of their preferred and alternative courses of action to their superiors, and then to act as effectively as possible within the instructions and resources given. It is for this reason, that air power doctrine education is of such critical importance at all levels in an effective air force. Not only must the airman fully understand the intricacies of the application of air power, but he must be able to express this knowledge in a form that others can appreciate.

Limitations

7. Size. Air power doctrine is an enormous topic area and this paper has necessarily been kept short. Consequently the paper is direct; it states principles rather than deriving them, and does not illustrate established doctrinal principles with examples. The paper has been written so that both the airman and non-airman alike can derive some value from the paper. As retired USAF General William M. Momyer pointed out: 'We find ourselves constantly in a dilemma as to whether too much detail has been presented or whether we have become so terse that the meaning (of doctrine) is clouded and darkness descends upon the reader.'

8. Scope. This paper is divided into two parts. The first part concentrates on the strategic level of air power doctrine and associated issues. The second part addresses wider doctrinal issues that are not specific to air power. Either part can be read without reference to the other. The first part commences with an examination of the nature and purpose of doctrine. It then goes onto a description of air power itself; what it is, and why it differs from land and sea power. In order to visualise the concept of air power, Chapter 4 introduces an air power structure model, that demonstrates how the many facets of air power are related. The penultimate chapter of Part One examines the principles that guide the

application of air power at the strategic level of war. The last chapter of Part One puts the strategic, operational and tactical aspects of air power into context, and provides a link between this paper and the missing level of doctrine, namely that doctrine related to the operational level of war. Part Two of this paper very briefly reviews war, and also includes chapters on the Law of Armed Conflict and Rules of Engagement, which illustrate the legal, moral and political environment within which air power is employed.

9. Logistics and many other issues are critically important to the development and projection of air power. The limitations of space and the needs to maintain the stated aims mean that these issues which are comprehensively covered in other papers are not addressed in this paper.

CHAPTER 2

DOCTRINE

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

Frederick the Great

INTRODUCTION

1. Air power is the projection of force for a military purpose utilising a platform sustained in the third dimension. The aerospace environment is a unique medium in which to wage war, as it ranges both over the surface of the earth and vertically to infinity. The contiguous nature of the sky bestows upon those able to utilise it, certain distinctive advantages. The advantage of elevation over the enemy has long been recognised, and as soon as technology would allow, war followed men into the skies.

2. The introduction of air power did not change the essential nature of war, but it did change the way in which war is conducted.¹ Early advocates of air power realised that strict adherence to existing surface warfare doctrine would limit the inherent advantages of the new medium. The study of how best to utilise air power has engaged the minds of professional airmen since their first successful flights. This study has led naturally to the development of air power doctrine.

DOCTRINE

What Is Doctrine?

3. There are many definitions of doctrine. As with any range of definitions, the simplest is often the best. In the broad sense, doctrine is what we believe is the best way to do something, having considered our experiences and those of others. In an air power sense, doctrine is 'what we believe to be true about air power and the best way to operate an air force'. The key word in this definition is 'believe'. Believe implies a derivation from fundamental principles that could change if new evidence were introduced. Doctrinal

¹ Department of the Air Force, AFM 1-1, Volume 1, Basic Aerospace Doctrine of the United States Air Force, March 1992, Chapter 2.

beliefs are not rigid laws but an interpretation of the continuously expanding pool of experience. When formulated and endorsed, doctrine is authoritative, but nevertheless relies critically for its utility on the user applying his own judgment.

4. As a result of the continuously changing inputs to the doctrine process, the product is always rather abstract in nature. Doctrine will not offer a definite solution to a specific problem. It will, however, suggest the best course of action to take given what we know of the past, and that which we anticipate happening in the future. Doctrine acts as a compass indicating a general direction; it does not provide a detailed map. It guides the action, structure and development of combat forces and what those forces should do in war and why.²

5. It is important to recognise that doctrine is guidance, and not procedures. Air power doctrine requires both interpretation and the application of judgment by the user. In order to use this doctrine, the individual needs to have a sound understanding of the air environment. Procedures on the other hand, by their very nature, do not require interpretation, and can be applied by those with less of a strategic understanding. For example, developing a tax collection system requires an understanding of the principles of taxation and government policy; whereas completing a tax return is procedural, and does not require a high degree of understanding of the overall taxation system.

6. Our experiences and those of others, are the principle source of doctrine, but not the sole ingredient in its formulation. Doctrine evolves from the study of the past, and is based in the present for application in the future. The application of reasoned analysis to the experiences of the past, based on enduring principles, will link the theoretical and the practical in a series of generalised yet simple doctrinal guides.

Why Develop Doctrine?

7. War is a tragic waste of lives and materiel that often follows the failure of diplomacy. The formulation and application of doctrinal principles is an attempt to avoid having to 're-invent the wheel' each time an armed service engages in conflict. The reasoned study of historical conflicts, tempered with current strategic thinking and technological advances, will lead to the formulation of the best way to deal with future

² AAP 1001, The Condensed Air Power Manual, Air Power Studies Centre, Canberra, 1992, p 1.

conflicts. Endorsed doctrine is the link between our present thinking, and what we will do in the particular circumstances of the next war.

8. If the studies of history, strategy and technology are not continually pursued, the doctrinal base of an air force will quickly become invalid. This was amply demonstrated by the Royal Air Force between 1920 and 1940. An overly optimistic assessment of the effectiveness and apparent invincibility of bomber aircraft by air power theorists in the early 1920's was adopted by the RAF. Although being party to the development of radar, the Hurricane fighter aircraft, and having witnessed the Luftwaffe's capabilities in Spain, the RAF still believed that 'the bomber would always get through'.³ In 1939, believing that three bombers in tight formation could 'see off' any fighter attack with their combined gunfire, formations of unescorted bombers were sent over enemy targets in daylight.⁴ The formations consistently sustained losses in the order of 50% to fighters and anti-aircraft artillery. The bomber doctrine was obviously flawed. Its origin had been largely speculative and it had not been seriously questioned for nearly twenty years. The doctrinal lesson is that had the bomber doctrine been reviewed on a more regular basis, this situation would probably have been avoided.

Types of Doctrine

9. Military doctrine can be readily identified as either single service doctrine or joint doctrine. Single service doctrine varies between the services, as in each case it reflects the demands of the three different combat environments. Joint doctrine on the other hand addresses how best to combine the capabilities of the three distinct forms of combat power into an effective force.

10. Joint doctrine can only be developed as a consequence of first having enunciated single service doctrine as a basis. Joint doctrine therefore, should not place limitations or conditions on the interpretation and application of single service doctrine.

³ Stanley Baldwin, British Prime Minister, speaking to the House of Commons debate on disarmament, 10 November 1931, in John Terraine's, The Right of the Line, Sceptre, London, 1988, p 13.

⁴ *ibid*, p 101.

Levels of Doctrine

11. The comprehension of doctrinal principles is clarified and on occasion simplified by relating doctrine to the generally accepted levels of war. Thus, doctrine is often classified for convenience as being associated with either the strategic, operational or tactical level of war. The distinctions between the levels of war are primarily related to command structures, thus the doctrine associated with each level generally aligns with the type of factors that a commander at that level would have to consider.

12. Strategic. Doctrine at the strategic level of war establishes the framework and foundation for the employment of a nation's military strength in pursuit of national objectives.

13. Operational. Doctrine at the operational level of war links a nation's military strategy to the tactical employment of its fielded forces. The doctrine guides the commander to establish priorities, set objectives, initiate actions and apply resources within an individual theatre of war. It is at the operational level that wars are largely won and lost, and the true skill of the general is displayed. For this reason the interpretation of doctrine and application of command at this level are often described as the 'operational art'.

14. Tactical. Doctrine also applies at the unit and sub-unit level where the combat engagements are actually fought. This doctrine is specific to weapon systems and particular roles and tasks. Tactical level doctrine is particularly sensitive to the response of the enemy, technology and time.

Application of Doctrine

15. The unique air power doctrine of a specific air force serves many purposes, with education being the most important. Doctrine also formally records the beliefs that have been derived from the analysis of collective experiences. Once disseminated, doctrine offers the benefit of those distilled and closely considered experiences to newer generations within the air force. Doctrine also represents the mechanism through which all aspects of the air force's activities should be linked. It forms the basis from which planners will determine the best way to develop and employ that force's air power in the future. Finally, doctrine can act as a catalyst to initiate and guide research and development.

16. To be of value, however, doctrine must meet three criteria: it must be understood by all those it affects; it must be valid and remain so; and thirdly it must be implemented or translated into action.⁵

17. Understanding Doctrine. An understanding of doctrine and its place within an armed service can only be achieved through education. It is not enough to simply read doctrine to understand it. If the reader does not understand the origins, development and purpose of doctrine, there remains a serious risk that it will be applied dogmatically. Should this happen, the essence of doctrine is lost, and it becomes of limited use.

18. If the fundamental reasons for establishing doctrine are understood, the validation and implementation of doctrine should flow automatically. The primary method by which an awareness of doctrine is established within an air force, is through a structured doctrine education program.

19. Validating Doctrine. Doctrine must be derived from sound fundamentals. This requires an academically stringent and objective analysis of the historical antecedents, together with an imaginative extrapolation of the present into the foreseeable future. Doctrine can only maintain its applicability through continual reassessment and validation of the available data.

20. Implementing Doctrine. In order for doctrine to be of value it must be used. Doctrine should be implemented on a day-to-day basis through procedures that are derived from the interpretation of doctrine. New organisations, operating procedures or changes to existing structures must always be aligned with doctrine, and not allowed to grow on top of existing practices for the sake of simplicity. Doctrine that is not widely disseminated is pointless, and doctrine that is not used is worthless.

THE DOCTRINE DEVELOPMENT CYCLE

21. The Doctrine Development Cycle (figure 1) illustrates the fundamental elements of the doctrine development process. The diagram is divided into three parts; the past, the present, and the future. It is important to note that the process is both cyclic and

⁵ Drew, Dennis M., Snow, Donald M., Making Strategy, Air University Press, Maxwell AFB, Alabama, USA, August 1988, p 168.

continuous. The critical analysis, development of doctrine, and the formulation of strategies occur in the present but draw on elements from both the past and the future.

Relationship Between Doctrine and Strategy

22. Derived from the Greek word for generalship, strategy was initially a military concept. With time use of the term has spread to many other facets of life and business. In the simplest terms, a strategy is a plan of action that organises efforts to achieve objectives.⁶

23. Doctrine is the starting point for the development of a strategy. Through careful consideration of doctrine before developing a strategy, one is more likely to avoid the pitfalls which have been experienced in the past. This is a circular process, whereby those strategies that have generated successful experiences are more likely to feed back into the doctrine process. Thus, doctrine influences strategy, and the experiences gained from the strategy form the basis for future doctrine.

Relationship Between Doctrine and Policy

24. In a democratic society, the activities of the armed forces are closely controlled by the political mechanism of that society. The armed forces receive direction as to the scope and purpose of their activities through defence policies, budgetary limitations and a wide range of other checks and balances. It is within this environment that military doctrine and defence policy can become confused.

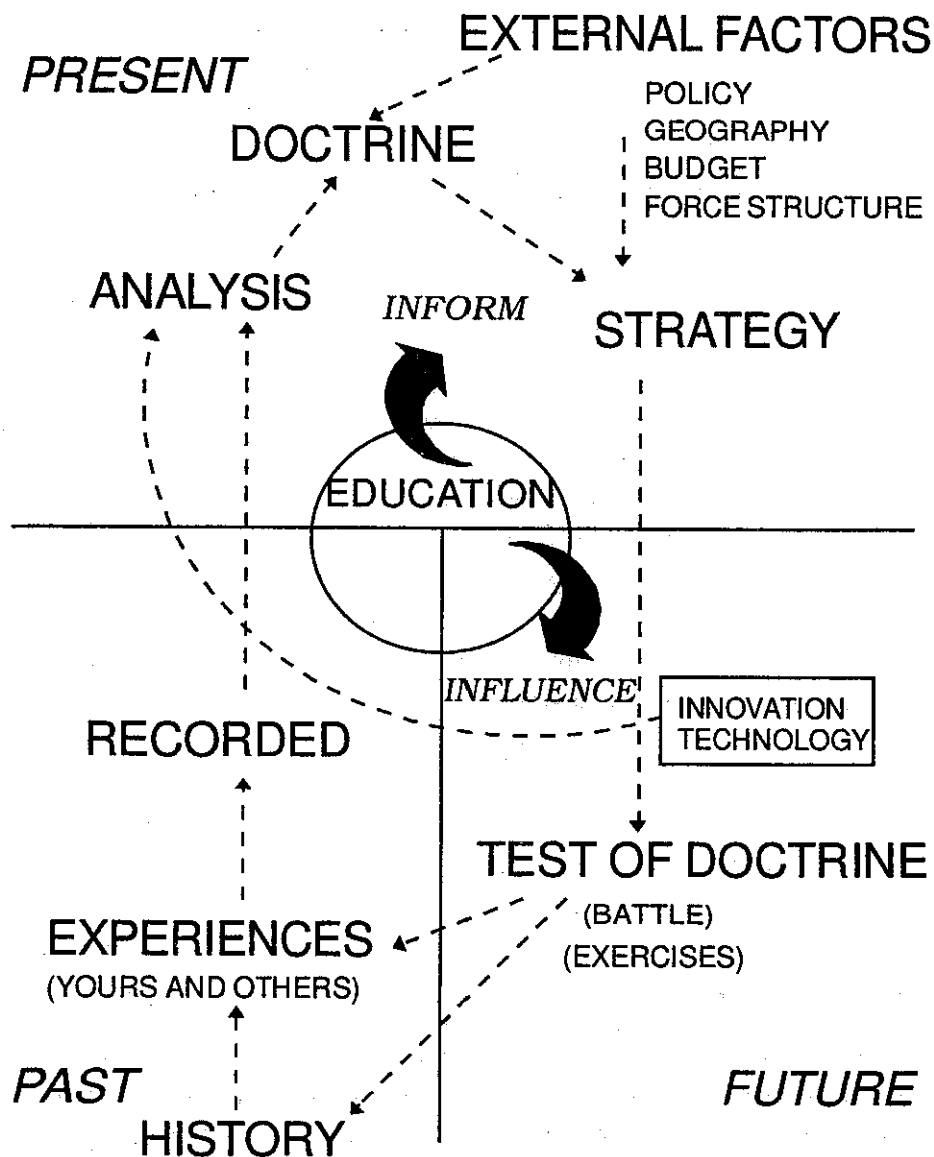
25. Doctrine and policy are different conceptually, but are often expressed in a similar terms. What must be guarded against is the person or the document that cannot distinguish one from the other, or implies that they are one and the same.

26. Developing doctrine that clearly contradicts existing defence policy is likely to be an unrewarding exercise. On the other hand, writing doctrine primarily to satisfy existing policy, no matter how well intended, is an equally pointless practice. Clearly, at some point a balance must be struck between the practicalities of policy and the interpretation of doctrine.

⁶ *ibid*, p 13.

Doctrine Development Cycle

(figure 1)



27. Care should be taken to ensure that doctrine and policy are clearly identified in doctrinal publications. An author of doctrine will usually find it necessary to include aspects of current defence policy within a doctrinal statement in order to put the implications of the doctrine into context. The risk is that over a period of time, the policy issues may become indistinguishable from those of doctrine. Eventually, what is being passed as critically considered truths of air power, may well be no more than a long-standing policy, the basis of which could have little or no foundation in doctrine.

28. In summary, defence policy will in some part be present in the air power doctrine of a nation. An issue for all air forces is to retain a robust doctrine development cycle which is not driven by policy making mechanisms. Nevertheless, the two processes are necessary and should be given sufficient flexibility so as to allow both to remain valid and still be compatible.

External Factors

29. In an ideal world external non-military factors would not feed back into air power doctrine. The doctrine would be independent of political, budgetary or force structure influences. In effect, it would be based solely on an analysis of experiences. In the real world, however, the doctrine/strategy relationship is skewed by external factors. There is an enormous number of such factors, all with a different level of impact on doctrine.

30. In periods of extended peace, for example, external political and economic factors tend to influence military strategy to a greater degree than doctrine. Military advice and requests concerning force structure, weapon system procurement, and levels of capability (all of which are - or should be - based on military doctrine) are variously ignored, overruled, or modified because of external factors that assume a greater importance in the short-term political cycle.⁷

Innovation and Technology

31. The doctrine development process must also be receptive to innovative ideas and developing technologies. Those responsible for the analysis of the factors influencing doctrine should also be looking to the future to gauge which ideas and technologies have

⁷ *ibid*, p 173.

merit. The true skill is analysing this data in a sufficiently rigorous and academic manner, so as to be free from any preconceived ideas of what the answer should be.

EDUCATION

32. Education is the primary purpose of doctrine. A structured doctrine education program will give an air force an increase in academic depth and robustness, that will allow it to fully apply the leverage of its air power doctrine. The investment of time and resources into a doctrine education program will be more than repaid in the future. A sound understanding of doctrine is a powerful tool that is applicable to virtually all facets of service endeavour.

Internal Education

33. The sharpness of mind and keenness of eye, so actively sort by air force recruiters, is seldom encouraged to develop beyond the unit level, either in the cockpit or workshop. Air forces are good at conducting technical and tactical training, but often fail to capitalise on the latent potential of their manpower by restricting the opportunities for continued education. In order to maximise the effectiveness of its manpower pool, an air force should ensure that air power doctrine is a structured educational activity that progresses through successively higher levels as the serviceman's career develops. This is especially true of the officer corps, where operational planning and command decisions should be made on a wide base of sound professional knowledge.

External Education.

34. Air power is becoming increasingly dominant in modern combat operations. Because of this, air forces are obliged to educate the surface forces in the principles of air power doctrine, so that the surface forces may better understand and employ air power in joint operations. The opportunity should be taken wherever possible to extend air power doctrine education to the other services, the wider defence community, and those civilians with an interest in air power, as distinct from aircraft. It is in the immediate professional interest of a small air force to offer air power education opportunities to the surface forces, even though they may not be requested.

Education as a Force Multiplier.

35. In an air force the term 'force multiplier' is used to describe a capability that allows a given input to produce a relatively greater output of effective combat power; in other words, any system improvement which increases the efficiency or effectiveness of a military force.⁸ In an important sense, a doctrine education program is a force multiplier because it improves the corporate understanding of the application of air power; that is, both the benefits and the disadvantages.

36. When applied across all ranks, a doctrine education program will increase the level of awareness throughout the air force. Experience in air forces has shown that clearly enunciated air power doctrine which is disseminated through a structured education program results in a number of positive benefits. These include a clearer perception at all levels of the fundamental purpose of an air force. It also enables personnel in all branches to discuss the operation of their air force in common terms. Since it promotes the sense of common purpose essential in an effective military organisation, air power doctrine is an investment in that air force's success in the future.

Influence.

37. As the world experiences an extended period of relative peace, there are fewer and fewer politicians and senior civil servants with a military background, or indeed an understanding of the military ethos. To counter this, military leaders will have to take every opportunity to educate their civilian counterparts in military doctrine. By increasing the level of knowledge these people have of air power, an air force could expect to improve its working relationships with them. As a consequence of this education, the arguments for and against certain equipments or capabilities should be more straight forward. Once an air force's doctrine has been accepted by the 'defence bureaucracy', that force is less likely to have to 're-invent the wheel' in terms of basic air power concepts each time a new force requirement is considered.

38. Educating and Influencing Policy Makers. The relationship between doctrine and policy may not be fully appreciated by those who are in a position to formulate policy but have not been exposed to military doctrine. All air forces are, therefore, obliged to educate

⁸ Chipman, Group Captain D.C., The RAAF and Force Multipliers, Air Power Studies Centre Paper No 13, Canberra, May 1993, p 2.

defence policy makers in air power doctrine. In this way the policy makers will be better prepared to consider and formulate national and defence policy. Admittedly there are many more factors that influence defence policy than just air power doctrine. However, it is a precondition of sound policy formulation involving the use of air power that the policy makers are properly informed.

39. Thus, through the field of education, doctrine will on occasion be able to influence the external factors that normally would have acted unchecked on the doctrine cycle. The politicians and senior civil servants that understand air power, will better appreciate the impact that decisions under their control will have on air power, and thus the air force.

DOCTRINE AND THE FUTURE

Doctrine and Technology

40. Doctrine is derived from the past, developed in the present for application in the future. The true benefit of doctrine is not what it tells us about the past, but what it suggests about the future. Therefore the doctrine development process should both analyse and influence the direction of new and developing technologies. Technology should not be left to run its own course, but instead be interactive with doctrine. Military doctrine must indicate the areas in which technology should progress, and in turn be receptive to the potential advantages that new technologies may offer.

Doctrine and Force Structure

41. Doctrine is also a fundamental element in the development of future force structures and capability requirements. Although force structures are continually changing they also exhibit enormous inertia, and so must be set on an accurate course. It is critical therefore that the doctrinal guidance that is being used to map the future force structures be focussed far into the future, and not to the immediate future as policy is more likely to be.

42. The guiding influence of doctrine in force structure and capabilities requirements is best illustrated by an example. The decision whether or not to purchase an anti-radiation missile (ARM) will depend on a range of issues that include cost, maintainability, operational characteristics and doctrine. The impact of doctrine on this decision is not to select a

particular missile type, but to indicate the applicability of this technology or capability to the employment of air power.

43. Briefly, the doctrinal argument in this case may proceed along the following lines. In isolation, the ARM has no greater destructive power than a single bomb, and the weapon itself is less flexible than a bomb because it can only be effective against one specific type of target. The key to its usefulness, however, is in the opportunities that the ARM opens for other weapon systems. The use of ARM to destroy surface-based radar will reduce the effectiveness of the associated surface-to-air systems. This reduction in risk will allow a wider range of friendly air power assets to operate in that area, and lead to more accurate employment of other weapon systems. The ARM can be used equally as well in support of surface forces, both on land and at sea. And finally, the threat of the missile alone may well force the enemy to reduce radar emissions, and thus deny him vital intelligence. The doctrinal argument would thus support ARM technology.

CHAPTER 3

AIR POWER

In the air all directions lead everywhere.

H.G. Wells.

THE AIR ENVIRONMENT

1. The third dimension was the last combat stage to be conquered because it is the most technically challenging. Air and space offer special advantages and, unfortunately, disadvantages to those who utilise the medium in war. The third dimension imposes upon air power a set of readily identifiable characteristics, which serve to separate it from land and sea power.
2. Air and space are harsh environments within which to operate. Being at best an invisible vapour or indeed nothing at all, the third dimension poses unique problems. With increasing altitude the airman is exposed to decreasing temperatures and pressures, oxygen becomes rarefied and is soon insufficient to support life. To utilise the third dimension, man has had to become its technical master.

CHARACTERISTICS OF AIR POWER

3. Air power has clearly discernible characteristics. These characteristics are a consequence of the air environment, and are most often exploited by air commanders to both preserve assets and maximise the effectiveness of air power. The surface forms of combat power exhibit some of the same traits but not generally to the same degree. For example, both air and sea power can operate over long distances, but air power can cover those distances in a fraction of the time.
4. A study of aviation shows that air power has positive, negative and conditional characteristics. Conditional characteristics are situation dependent. Under favourable conditions they have a positive influence on air power, and in unfavourable conditions they have a negative influence.

Positive Characteristics.

5. Air power's positive characteristics give it an advantage over land and sea power. In planning operations, it is the responsibility of the air commander to use the positive characteristics to maximise the effectiveness of the air power assets that he has available.

6. Elevation. Elevation above the earth's surface provides air power with an advantage over surface-bound forces by freeing it of the natural limitations of geography. Elevation provides a broader perspective, and greater potential for speed, reach and three dimensional movement. This characteristic allows air power to observe and dominate the forces below.⁹

7. Speed. Being free of contact with the surface of the earth, air power assets can move at much greater speeds than surface forces. This characteristic allows air power to be brought to bear with little delay. Speed makes air power particularly responsive, and results in a swiftness of application that is seldom matched by land or sea power.

8. Reach. The combination of elevation and speed has given air power a degree of reach that is far in excess of that obtainable by surface forces in a comparable time. The characteristic of speed implies that these long distances will also be covered in a timely manner.

9. Flexibility. Air power is inherently flexible. Elevation, speed and reach bestow upon air power the flexibility to respond rapidly to changing circumstances. This change may require an aircraft to land and quickly reconfigure for the second mission, but increasingly, the use of multi-role aircraft allows two or more different tasks to be conducted on the same sortie.

10. Versatility. The characteristic of versatility adds a dimension of depth to that scope already achieved by flexibility. Air power derives versatility from the depth of its flexibility. As an example, the C-130 Hercules aircraft demonstrates flexibility through being able to reconfigure from cargo carrying to troop carrying and back again very quickly. The versatility of the C-130 is that it can be used for: air-to-air refuelling (KC-130), a gunship (AC-130), electronic warfare (EC-130) and special forces operations (MC-130).

⁹ Basic Aerospace Doctrine of the United States Air Force, op cit, p 5.

11. Pervasiveness. Of the earth's surface, 30% is covered by land, 70% by water and 100% by air. The air environment and thus air power has access to the entire surface of the globe. Air power is pervasive.

Conditional Characteristics

12. Conditional characteristics can either be positive or negative depending upon the situation. The factors which influence the conditional characteristics are generally beyond the control of the airman. However, consideration must be given to force structure, organisational design and education to maximise or minimise the impact of conditional characteristics where appropriate.

13. Sensitivity to Technology. The third dimension is not man's natural element. He has only been able to master the air and space through technological advances. Air power is a product of technology and is bound to remain critically dependent upon it. This dependence results in air power being sensitive to even small advances in technology. If an air force has the capacity to employ these advances, its air power can quickly become more effective. Unfortunately, this sensitivity to technology can also result in air power assets becoming obsolete with little notice, because of a small technological advance in an opposing system. Small air forces are particularly vulnerable to advances in technology.

14. Cost Effectiveness. The cost effectiveness of air power varies considerably, depending upon the situation. Air power is costly, but in certain situations it can be more cost effective than surface forces due to its ability to complete the mission quickly. Yet, if misapplied, air power can achieve little whilst incurring enormous expense. Although air power may, on occasions, appear to be the simplest solution, the cost effectiveness of air power should always be considered by air power planners.

15. Political Responsiveness. The political responsiveness of air power is a conditional characteristic. It depends upon the political awareness of senior airmen, and the level of air power education of politicians. The political attractiveness of air power has increased rather than decreased with time, because of the air weapon's flexibility, ready availability, and unique ability to discriminate between targets, whilst risking comparatively few friendly combatants lives.¹⁰ The characteristics of air power make it particularly responsive to, and capable of, demonstrating a nation's political intent. It can deliver an unambiguous message

¹⁰ *ibid*, p 14.

quickly and at great distance, and at the same time remain remote and detached. On the other hand, the use of air power as a political tool is dangerous if it is misunderstood or mis-employed by politicians.

Negative Characteristics

16. Air power has five significant negative characteristics. They must be considered as closely as the positive or conditional characteristics, so that their impact on air power can be minimised.

17. Impermanence. Air power in support of surface forces tends to be characteristic of each particular action or mission. Because the presence of air power tends to be transitory, it seldom maintains a permanent presence in the third dimension. Air power therefore does not 'hold ground' in the traditional sense. Impermanence can also be a consequence of the adverse influence of weather and the constraints of aircraft range and endurance.¹¹ Given large numbers of aircraft and air-to-air refuelling, air power can approximate a permanent presence by repeated overlapping sorties. Two examples of this pseudo-permanence are the Berlin airlift and the defence of Khe Sanh during the war in Vietnam.

18. Vulnerability. Air power is vulnerable to attack, both in the air and on the ground. Aircraft must return to the ground to refuel and re-arm and are thus concentrated in small areas. This concentration of aircraft and associated support facilities at fixed bases makes air power a high value target for an adversary's air and ground forces. The long lead time associated with replacing aircraft and trained personnel lost in combat or accidents results in a premium being placed upon achieving the aim with the minimum risk of attrition. Consequently, the use of air power may be restrained or withheld completely if the risk of attrition is not commensurate with the desired result.¹² The vulnerability of air power was amply demonstrated on 5 June 1967 when the Israeli Air Force destroyed 66 percent of the Egyptian Air Force's aircraft on the ground in the course of a morning. They continued their attacks on neighbouring Arab states and by evening had destroyed over 500 Arab aircraft for the loss of 20 Israeli machines.¹³

¹¹ AAP 1000, The Air Power Manual, Air Power Studies Centre, Canberra, 1990, p 31

¹² *loc cit.*

¹³ Armitage, M.J., Mason, R.J., Air Power in the Nuclear Age, University of Illinois Press, Chicago, 1985, p 117.

19. Cost. The demands of the aerospace environment and the associated technical dependency have combined to make air power expensive in comparison to the surface forms of combat power. Air power is costly to acquire, operate and maintain. High costs are also associated with the prolonged and detailed training required by personnel and the extensive base support facilities required. As long as air power remains dependent on technology, it will be costly.

20. Base Dependency. Air power operates most effectively from permanent bases. Virtually all modern aircraft types are dependent on established airfields and support facilities, although some vertical take-off fixed wing aircraft and rotary wing aircraft can operate away from fixed facilities for a short period of time. This dependence on a large supporting infrastructure is a *negative characteristic of air power*. It results in air power assets becoming concentrated at readily identifiable points where they become vulnerable to attack. This dependency can also limit the effectiveness of air power in a particular theatre if suitable airfields are not available or need to be built.

21. Although vulnerable to attack, permanent bases are difficult to destroy. Runways and taxiways cut by bombing can generally be repaired in a matter of hours or days. Conversely, the replacement of 'soft skinned' elements such as aircraft and trained personnel may take months or years. The aircraft carrier is the most vulnerable 'airfield', because if it sinks it is a total loss.

22. Payload. The positive characteristics of *elevation, speed and reach must be balanced* against the actual weight or volume of materiel that air power can deliver to the area of interest. When compared to surface transport means, only relatively small payloads can be delivered by aircraft and spacecraft. Air power is primarily called upon to deliver materiel that is either time critical, high value, or that which cannot be delivered cost effectively by surface means. The power required to lift a payload into the air or space, and the practical limits on the physical size of aircraft, both combine to limit the payloads that air power can deliver.

CHARACTERISTICS OF AIRMEN

23. The professional airman is an integral part of the air power he manipulates. Prolonged exposure to an air environment has conditioned the airman to think in terms of the technology he utilises, and the medium through which it is projected. The professional

soldier tends to be a leader of men, and developer of group skills, whereas the airman utilises technology with the support of technicians. This is perhaps best illustrated in the different manner in which the three services engage in combat. In stark contrast to the surface forces, an air force sends only a very small number of highly trained officers and SNCOs into combat.

24. Prolonged association with the air environment has resulted in environmentally related characteristics becoming imbued in the human fabric of air power. Most noticeable amongst these are the time and space perspective, flexibility and high levels of individual skill.

Time and Space Perspective

25. Exposure to the air environment has resulted in airmen developing a different time and space perspective from that of surface combatants. The airman's view of the world tends to be wider and more general than that of his surface force contemporary. The airman makes little distinction between strategic and tactical missions, and thus tends to favour strategic solutions over tactical solutions. This characteristic occasionally puts the airmen at odds with surface combatants who tend to demand air power they can see in action, and who see less immediate benefit from those air actions that occur beyond the horizon.

26. In order to make the best use of air power, a commander must be conversant with, and comprehend, the very different order of magnitude of time and space for air power frames of reference, when compared to surface frames of reference. The airman thinks in terms of hours, minutes and seconds, and of hundreds and thousands of miles. A soldier is more likely to think in terms of the range of the weapon he operates, and a sailor in terms of the distance a ship can steam in a day.

Flexibility and Adaptability

27. Prolonged association with the aircraft and systems used to project air power has led to airmen adopting an attitude of flexibility and adaptability. This resulted from association with a system that is inherently flexible and employed in three dimensions not two. With air power there are often a number of different ways to achieve the same result, or indeed a number of different tasks being conducted simultaneously.

Technically Skilled

28. Largely because of air power's high reliance on technical sophistication, the role of the airman has always demanded a higher degree of cognitive skills than that generally associated with soldiers and sailors. This is not because what the airman does is any more dangerous or demanding, it is because of the technological dependency of air power. To this end, airmen, whether on the ground or in the air, are selected for their technical skills before those military qualities normally associated with the other two armed services.

CHAPTER 4

AIR POWER STRUCTURE

The beginning of wisdom is calling things by their right names.

Confucius.

THE STUDY OF AIR POWER

1. The study of air power is in its infancy when compared to the study of land and sea power. Airmen themselves are partially responsible for the lack of informed debate on air power issues. In the early years, they often made exaggerated claims of what the technology of the day, or indeed the near future, would attain. It has often been noted that airmen have tended to be technocrats, showing interest in their machines, at the expense of the abstract or strategic elements of their profession.
2. It is essential that airmen are able to understand the intricacies of air power, and can explain them in straightforward terms to the other services and their political superiors. One way to encapsulate air power in an easily understood form is an air power model. The model in this chapter is representative of the contemporary application of air power components.

AIR POWER STRUCTURE MODEL

3. For many years, a nation's air power has been defined in terms of squadrons of type A aircraft and squadrons of type B. This rather simplistic approach, which addresses hardware and not capabilities, automatically blinkers the vision of those attempting to understand air power. More correctly, the air power that a military force can project needs to be defined in terms of capabilities and roles. The essential unit of measure is what an air force is capable of, and not what it is. Thus, the order of battle is replaced by an order of capabilities. This approach acknowledges the true flexibility of the aerial platform.
4. The Air Power Structure Model (figure 2) is a diagrammatic way of representing the nature and range of capabilities required to fully exercise air power. Figure 2 is a generic air power model and is, therefore, not intended to represent any particular air force or force

structure. The model does not specify aircraft types or degrees of capability. Answers to those questions are determined by national policy, threat, budget and defence strategies. For example, the model recognises that Close Air Support is an important capability. Whether this is achieved by Fighter Ground Attack (FGA) aircraft, armed helicopters or heavy bombers is independent of the model.

5. Small air forces will find it difficult to accommodate all the capabilities within a limited force structure. Those forces should however, be aware of the limitations that are associated with a shortfall in certain areas, and the need to be able to integrate with allied air forces which have a more complete range of capabilities. Each air force will decide not only whether it will pursue a capability but also to what degree. Should the capability be limited to the hours of daylight or be available 24 hours per day? Should the capability be manned, unmanned or abandoned altogether in favour of an alternative force structure?

THE COMPONENTS OF AIR POWER

Air Power

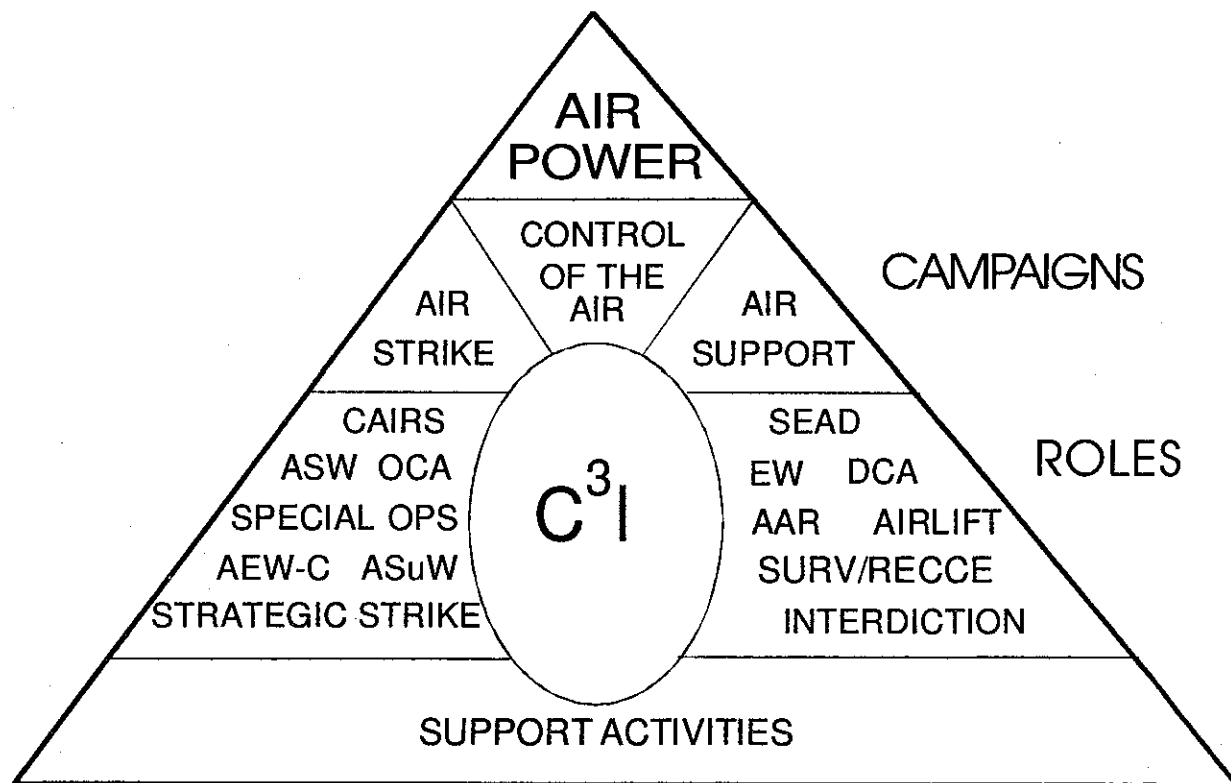
6. Air power is at the peak of the triangle and is the product of all the elements below it. The final air power product is the combination of technology, manpower and doctrine. Only one of the three constituent parts of air power is directly related to aircraft and the associated hardware, with the other two components being human in essence. It therefore shows that the projection of air power is both a human and mechanical endeavour. In this context, the model should be viewed as an integrated system of technology, manpower and doctrine, and not as a series of discrete activities.

Campaigns

7. The three air campaigns form the next level of the model. The central pillar is 'control of the air', as it is the prime campaign, and is used as the basis for progress to the other campaigns. The place of the 'air support' and 'air strike' campaigns is critical. All three campaigns interlock to form the platform on which air power is based. In certain rare cases, individual campaigns have been successfully prosecuted. However, the weight of historical evidence shows that a strategy of concurrent campaigns is most often effective.

Air Power Structure Model

(figure 2)



8. Control of the Air. The control of the air campaign is pursued for the purpose of gaining freedom of action in the air, and in turn, freedom of action on the surface. To achieve control of the air it may be necessary to engage the enemy's air power both in the air and on the ground. In addition, operations conducted under the air strike or air support campaigns can assist in winning control of the air. For example, an element of the air strike campaign could target enemy fuel production and distribution systems, thus making it easier to achieve control of the air.

9. Although the prime campaign, achieving control of the air alone is not a war winning strategy. The purpose of winning control of the air is so that an air force can bring the other two campaigns into full and complete operation, and simultaneously deny the enemy the opportunity to do the same. The most important thing that air power can deliver to the surface force is air superiority, since it then allows that force to take the initiative and conduct its own operations free from interference by enemy air.

10. Air Strike. The air strike campaign is primarily strategic in nature and takes the air war to the enemy in the battle area, his homeland and the point of his national interests. This campaign targets the war-making and war-sustainment potential of that nation through attacks on his centres of gravity. An air strike campaign must be designed to bring maximum pressure to bear on the opponent's decision-making mechanism, in the shortest period of time. This goal can be more readily achieved if the air strike campaign is focussed on strategic centres of gravity, and not wasted on militarily attractive but otherwise poor value targets.

11. The air strike campaign is the most politically sensitive of the three campaigns. In order to be effective, the campaign generally targets infrastructure and not fielded military forces. Such attacks are often interpreted as attacks on civilians and thus unfair. Thus, clear and finite objectives must be agreed upon at the highest levels of command, so that the campaign can be planned and target sets selected to achieve the aim quickly and cleanly.

12. Knowing what and when to strike in order to achieve the maximum effect is a problem that airmen have struggled with since the very beginning of aerial bombardment. Valuable lessons on the application of strategic bombing have been learnt from all major aerial conflicts of the last 60 years. In combination, developments in air power doctrine and technology have now led to a point where the centres of gravity of a nation can be reduced to specific target sets, and subsequently identified, targeted and destroyed. More importantly perhaps is the acknowledgment by airmen that strategic bombing cannot always

guarantee the desired results, and that in certain circumstances it is an inappropriate use of air power.

13. Air Support. The air support campaign applies air power to directly complement any operation or the projection of combat power on land, sea and in the air. Air support is not a subsidiary of surface campaigns but an integral component, enhancing the capabilities of surface combat forces in terms of firepower, mobility, and sustainability. The air support campaign is also a vital element in the sustainment and success of the other air campaigns. This campaign is most effective after control of the air has been achieved.

14. The air support campaign is applicable to the entire armed conflict continuum. Air operations related to peacekeeping, disaster relief and humanitarian aid are part of the air support campaign. Arguably the most noteworthy demonstration of the air support campaign in isolation was the Berlin Airlift of 1948-49. This airlift was a herculean effort of truly strategic consequence, in which the West was able to demonstrate its resolve to the Soviet Union, solely through the application of air power. Perhaps the whole episode being made more poignant by the fact that no shots were fired.

Roles

15. There are 14 air (and space) related roles in the model. They are the capabilities that an air force or coalition of air forces requires to exercise the full potential of air power. A small air force will generally not have the capability to exercise all the roles. That air force should not, however, discount or ignore the doctrine associated with the model. Within the model itself the roles are randomly listed to show that no particular role relates to any other role or campaign. Some of the roles can be further divided into sub-specialisations, but these do not alter the basic concept of the model.

16. Close Air Support (CAIRS). CAIRS is the application of air power through an air attack in such proximity to friendly ground forces that close liaison and detailed integration is necessary, so as not to unduly endanger those forces. CAIRS is requested by the surface force at crucial points in both attack and defence, in order to create opportunities that surface elements alone cannot achieve.

17. Offensive Counter Air (OCA). OCA is the application of air and surface assets with the objective being to destroy, disrupt or limit enemy air power as close to its source as possible.

18. Defensive Counter Air (DCA). DCA is the protection of assets from air attack through both defensive measures, and the destruction of the enemy's air attack capability in the air in a defensive context. DCA includes the use of both active and passive surface-based air defence systems and procedures.
19. Suppression of Enemy Air Defences (SEAD). SEAD is an activity that neutralises, destroys or temporarily degrades enemy air defence systems in a specific area by using physical attack and/or electronic warfare.
20. Airlift. Airlift includes operations to transport manpower and materiel by air, using fixed and rotary wing aircraft, and may include delivery by parachute. The airlift is the role that civil aviation aircraft are best suited to, and most often called to support.
21. Special Operations. Special Operations are conducted by specially trained, equipped and organised forces against targets in pursuit of military, political, economic or psychological objectives.
22. Anti-Submarine Warfare (ASW). The ASW role is conducted by fixed and rotary wing aircraft, and involves offensive and defensive operations designed to neutralise, disrupt, or stop enemy submarine activity. This role requires highly specialised equipment to be effective, and represents the only viable counter to the strategic level threat posed by modern submarines.
23. Anti-Surface Warfare (ASuW). ASuW includes joint air/surface operations designed to defeat enemy surface combatants and other forms of shipping, that are in such proximity to friendly vessels that coordination is required.
24. Interdiction. Interdiction is designed to restrict enemy manpower and war fighting materiel from moving into, within, or out of the battle area. The aim of interdiction is to isolate the battle area by cutting the enemy's lines of communication, and limiting his ability to manoeuvre. Interdiction can be conducted against either land, sea or air targets. The closer interdiction is conducted to friendly forces the more immediate the effect, and therefore the greater the degree of coordination required.
25. Strategic Strike. The strategic strike role attacks enemy centres of gravity in order to reduce his capacity and/or will to fight. This role can be completed by both manned and

unmanned platforms. Cruise and ballistic missiles will play an increasingly important part in this role in the future.

26. Electronic Warfare (EW). EW is the gathering and/or denying of information through the use of the electromagnetic spectrum. EW has a force multiplying effect, and is an integral part of all campaigns and roles.

27. Airborne Early Warning and Control (AEW&C). AEW&C covers operations that utilise airborne detection and command systems to detect the enemy and coordinate friendly air activity to best effect. The limitations of both mobile and fixed ground based radar systems are severe. AEW&C utilises the characteristics of elevation, speed and range to extend the scope and control of the battle area. AEW&C has a force multiplying effect.

28. Air to Air Refuelling (AAR). AAR is the refuelling of one airborne platform by another to increase the range and endurance of the receiving platform. AAR has a force multiplying effect.

29. Surveillance and Reconnaissance. Surveillance and Reconnaissance cover the use of aerial and space platforms to detect, locate and monitor the disposition of enemy forces and targets. Certain civil aviation assets are specifically designed to conduct the surveillance role, these aircraft normally operate in a coast-guard or customs service related environment.

Support Activities

30. Support activities form the base upon which all aspects of air power depend, and are responsible for the generation and sustainment of the components of the air power model. They are too numerous to include in the diagram and cover an enormous range of activities including logistics, recruiting and training, ground defence, administration, and specialised civil industry and infrastructure.

31. Although appearing at the bottom of the model, the importance of the support activities should not be under-rated. The projection of air power is a resource intensive operation that relies on an enormous number of component elements being available in a timely and structured manner. Most modern weapons are integrated systems that require the support of a wide range of inputs in order to operate effectively. For example, whereas in the past the preparation of aircraft weaponry was the responsibility of armourers alone,

today it requires input from armourers, avionics technicians, software specialists and intelligence analysts.

32. The characteristics of air power make it largely dependent upon complex support facilities at established bases or ships. The same characteristics however, also demand that essential elements of that support must be able to follow the aircraft when they move to another operating location. Thus whilst air power may be dependent upon, and in large part generated from fixed locations, it must never be fixed to a single location. In this context it is the responsibility of the support activities to ensure that air power is provided the freedom to move its point of origin from one base to another both quickly and whilst maintaining its effectiveness.

Command, Control, Communications and Intelligence

33. Central to the application of air power, and thus the model, is the element of Command, Control, Communications and Intelligence (C³I). The inclusion of C³I reinforces the fact that air power is not solely derived from hardware, but is critically dependent on human input. It also shows that command of air power assets should originate from a single point within the air system. That is, one experienced airman should be responsible for the command of all air power assets.

34. C³I is a powerful force multiplier. The pace of modern air combat is such that near real-time C³I is required to utilise the full potential of combat assets. The crux of offensive air power is targeting, and the selection of targets is dependent upon intelligence. Furthermore, if a force wishes to employ Precision Guided Munitions (PGM), then it needs equally precise intelligence. Unfortunately, this is a lesson that air forces the world over appear to have to relearn in each new conflict.

35. Good C³I systems take a long time to develop, are difficult to exercise properly and require a dedicated full-time staff. Small air forces are often tempted to shortcut on C³I in favour of additional aircraft and weapons. This may well prove to be a counter-productive strategy as the performance of the aircraft and weapons becomes increasingly dependent on the quality of the C³I support.

CHAPTER 5

THE APPLICATION OF AIR POWER

The truths of war are absolute, but the principles governing their application have to be deduced on each occasion from the circumstances, which are always different.

Winston Churchill.

AIRMINDEDNESS AND THE PRINCIPLES OF WAR

1. An enormous amount of valuable military experience has been distilled over hundreds of years, the essence of which is recorded as the 'Principles of War'. Because of their origin, these principles are generally expressed in terms of surface operations, and not in the context of the air environment. They are, however, equally applicable to the air environment, as they represent generic principles of combat, and are not associated with specific environmental considerations.

2. Airmen should reassess their understanding of the principles of war, and view them from an aerial perspective to develop a sense of 'airmindedness'.¹⁴ Airmindedness puts a new perspective on traditional military concepts which have until now been dominated by the two dimensional limitations of surface warfare.

3. Selection and Maintenance of the Aim. Selection and maintenance of the aim is the master principle in the air just as it is on the surface. This principle is fundamental to the application of air assets, as air power can so easily and quickly be turned to other sideline or secondary uses if the initial aim is not immediately achieved. The air power education of politicians and senior servicemen of all environments, together with centralised command of air power by a professional airman, is the best way to guarantee that the correct aim is selected and maintained.

4. Morale. Morale acts as a force multiplier in the generation and application of air power. Morale plays a much smaller part in air power's overall combat power than it plays in the combat power of surface forces. However, air power itself can be utilised to directly influence the morale of both friendly and enemy surface forces.

¹⁴ Basic Aerospace Doctrine of the United States Air Force, op cit, p 15.

5. Offensive Action. An individual battle may occasionally be won through defensive action, but wars are only ever won through offensive action. The characteristics of air power make this form of combat power inherently offensive in nature. Offensive action should be the first priority of all airmen, as only offence will allow a force to wrest the initiative from an opponent, take the conflict to the enemy, and thus set the time, the place and the tempo of the conflict.
6. The characteristics of elevation, speed, range and flexibility make defending against an air threat extremely difficult. Thus, the balance between offensive action and defensive action in the air environment favours offensive action. Victory in the air environment goes to the force able to adopt and maintain the offensive.
7. Security. The lethality and scarcity of air power assets makes the security of friendly air power from attack by enemy air or surface forces a paramount concern to airmen. The degree of security afforded to air power is a balance between protecting the assets from the threat, or risking them by employing those same assets to remove the threat.
8. Surprise. The characteristics of elevation, speed and reach bestow upon air power a high degree of inherent surprise. The choice of time and place (the essence of surprise) rests with the commander who holds the initiative. In an air environment, holding the initiative is generally only possible if one also has control of the air and adopts an offensive strategy.
9. Concentration of Force. Air power is most effective when it is focussed. Flexibility and versatility together with swiftness of application, allow air power to be rapidly concentrated and dispersed. Concentration in both time and space can be achieved as air power can have both tactical mass and manoeuvre simultaneously. Where possible air power should be applied in such concentration so as to achieve the objective with minimal attrition and deny the enemy the opportunity to respond. Certain factors such as endurance and the weather can act to reduce the effect and permanence of air power, so it is best applied in a concentration sufficient to overwhelm the enemy.
10. Economy of Effort. Air power is scarce, expensive and time consuming to develop. The tasks set for air power must be achieved using the minimum practicable assets that guarantee completion of the task with an acceptable level of attrition. The inappropriate application of air power must be guarded against.

11. Flexibility. Flexibility is a key characteristic of air power, and one that is usually limited only by the imagination of the air component commander and his battlestaff. The ability to change rapidly between different tasks adds depth and breadth to the employment of air power assets, and makes it a particularly flexible form of combat power.
12. Cooperation. Air power gains significant synergistic advantages through action with surface forces and other air power components. Airmen should take every opportunity to maximise the effectiveness of air power by practicing their cooperation and integration skills. Airmen must also advise and educate surface forces as to the capabilities of air power, and how best air power can be used to assist them in accomplishing their mission, and ultimately the joint mission.
13. Administration. Air power is resource intensive. To operate effectively, air power must be supported by an administrative depth and breadth equal to the range of tasks it is capable of performing. Administrative procedures and activities such as logistics and training must be as flexible and versatile as the aerial platforms they support. Administration should not limit or constrain the operation of air power.

MAXIMS OF AIR POWER

14. A maxim is a general truth drawn from science or experience, a principle or rule of conduct.¹⁵ From the study of air power history, limited though it is, it is apparent that there are four fundamental truths relating to the use of air power. The air power maxims are; concurrent campaigns, unity, professional mastery and balance. Application of the maxims forms the basis for the most effective utilisation of an air forces' air power assets. There may, however, be occasion where all of the maxims cannot be observed. In this case the effectiveness of the air environment will be reduced.

15. The pursuit of the maxims is an on going process that requires continuous refinement, and cannot be shortcut. The maxim of balance for example is not a set figure or force structure, but the progressive long-term development of a force to reflect the strategic, economic, political and combat requirements of an air force. Although the maxim of unity

¹⁵ The Concise Oxford Dictionary of Current English, Seventh Edition, University Press, Oxford, Great Britain, 1983.

may be adopted merely with the stroke of a pen, it is unlikely to be successful unless it is routinely exercised.

16. Although distinct, the four maxims are related through the application of air power. For example, it would be difficult to conduct concurrent campaigns without a balanced force or unity of command. The maxims of air power are applicable to all air forces in one form or another. They are often described in different terms, but the fundamental issues remain constant.

Concurrent Campaigns

17. The maxim of concurrent campaigns relates to the type of air power strategy that an air force will employ. Historical antecedents suggest that those air forces utilising strategies with concurrent campaigns tend to be more successful more often, than those pursuing strategies of only one or two campaigns at a time.

18. In air power terms, concurrent campaigns is a general strategy, anything less being a limited strategy. A limited strategy is one that does not have all the components. For example, a limited air power strategy would be an air strike campaign without attempting to win control of the air, or support the surface forces.

19. A general strategy is one that utilises all available components of air power in an integrated plan. Synergy is derived from the interaction between the campaigns. The air strike campaign is made easier because the control of the air campaign can reduce the air threat. The control of the air campaign is made easier because the air strike campaign can destroy the enemy's communications network. The air support campaign is made easier because the control of the air campaign can ensure a favourable air situation over the battlefield, and so on.

Unity

20. Air power is a composite of numerous roles, the full potential of which is only realised when it is treated as an entity. As with land and sea power, air power demands an operational and organisational uniformity rather than discrete 'penny-packeting' if economies

of scale are to be achieved.¹⁶ Unity is an issue of command, and how command is best organised in an air power context.

21. To achieve maximum effect, all air power assets should be under the command of a single air force officer who is expert in the application of air power. Control should be delegated as necessary to achieve the most effective use of the scarce resources. This results in the execution of operations being decentralised whilst the overall command and direction of the assets remains at the highest level.

22. The maxim of unity has wide-reaching implications in many facets of air power application. Unity of command is fundamental to the issue of apportionment of assets and the setting of campaign priorities. The flexibility of air power is ultimately manifest in the concept of unity of command.

Professional Mastery

23. The goal of every airman is to achieve 'professional mastery' of the air environment. Historical analysis indicates that those airmen who best utilised the capabilities and flexibility of air power in war, were those seeking, or from, an independent air force. In the organisation of military forces, the word 'independent' carries a great deal of emotional baggage. Independence is, however, only one of several means, and not the end in itself. The reason for forming an independent air force is to ensure that true professional mastery is gained over the third dimension; just as a navy should hold the mastery of the sea, and an army mastery of the land.

24. To exploit the complete potential of the third dimension, specialised training in air power's unique environment is mandatory. To produce both the depth and breadth of expertise necessary for planning, directing and executing all aspects of air power requires dedication to the air environment. Thus, professional mastery can only be obtained from the formation of independent services, each of which is master of its own environment.

25. Air power assets directly assigned to surface forces have surface support mission priorities that limit their ability to exploit the full scope of air power operations. Only an

¹⁶ The Air Power Manual, op cit, p 36.

air force is charged with preparing forces that are organised, trained and equipped to exploit fully air power's flexibility and potential decisiveness.¹⁷

26. Political leaders and surface commanders can never be expected to be fully conversant with the complexities of air power, any more than airmen can be totally conversant with politics, diplomacy or surface warfare. Maximum national combat power is achieved when the specialised skills resident in each of the three independent environmental forces work in concert in a joint endeavour.

Balance

27. Balance is the outcome of shaping a force structure to achieve particular capabilities, and the priority given to each of those capabilities. The relative emphasis on competing priorities determines the balance in the force.

28. Balance is more than a question of quantity versus quality. Many of the benefits of air power are derived through the synergy afforded by different aircraft types and the span of roles they cover. Balance should also strive to provide a qualitative edge over an adversary. Quality is achieved through leadership and organisational efficiency, the assets used, and the ability and training of personnel. Quantity of assets is also important because no nation should rely on just a few highly-capable platforms to perform all the necessary tasks. While a particular asset may be capable and versatile, it plainly cannot perform two discrete tasks simultaneously, whereas two less-capable assets can. An optimum balance of the competing demands for quality and quantity must be determined.

IMPERATIVES

29. The maxims of air power are vital to the development and sustainment of a small credible air force. They are, however, difficult to work with on a day to day basis. Opportunities to adjust 'balance', or influence 'unity' seldom occur, and then only at the highest levels. The specific interpretation that an air force places on the maxims will generate a specific set of imperatives for that air force. Some of the factors that will influence the interpretation of the maxims for a small air force are: the size of the armed

¹⁷ Basic Aerospace Doctrine of the United States Air Force, op cit, p 17.

forces, financial restrictions, the relative geographic disposition of forces and¹ neighbouring nations. The imperatives are how an air force will address the pursuit of the maxims on a day-to-day basis.

30. A considered selection¹⁸ of imperatives for a small air force are; command, qualitative edge, centres of gravity, preparedness, attrition management and timing. They are properties that can be influenced more directly and more often, to ensure that overall the maxims are observed.

Command

31. Command of an air force must be exercised at the highest practical level by a single, experienced commander with expertise in the application of air power. Command must be the first imperative of any small air force. The limited capacity of small air forces cannot be allowed to diminish further through poor command arrangements; they should instead capitalise on the benefits that a small, simple command structure can deliver.

32. For an air force, command means the exercise of judgment in providing positive guidance in the planning, direction and execution of air power. Although this command emanates from an expert individual, its interpretation and application soon become an enormously complex task that can only be achieved by a battlestaff of skilled airmen drawing on their current operational expertise. In order to remain flexible and responsive, the command imperative must be exercised regularly through the entire command chain.

Qualitative Edge

33. Small democratic countries will always tend to have small armed forces. It is important, therefore, that what is lacking in quantity is in some part compensated for by quality in both manpower and materiel.

34. Advanced technology is one way in which the qualitative edge can be pursued, but it is not the answer in itself. If it is to be effective, technology requires skilled personnel, and an understanding throughout the air force of how best to utilise technology in order to produce the qualitative edge.

¹⁸ The Air Power Manual, op cit, p 98.

35. The qualitative edge can also be sought in other less obvious yet still important areas. A small air force can gain enormous benefits by ensuring that its personnel are educated, motivated, and have the correct mental attitude toward achieving their particular task. Adopting high quality work practices and other management techniques can also make the individual and thus the system as a whole more productive.

Centres of Gravity

36. The central focus of a force is its centre of gravity. Air power is best applied when matched offensively against an adversary's centre of gravity whilst defending its own. While a nation has centres of gravity, an air force cannot hope to defend these effectively if it cannot identify and defend its own centre first. Likewise, on the offensive it will be most effective if it initially attacks the adversary's centres of gravity. The identification and protection of the centres of gravity is a continual process, and not one that is associated solely with armed conflict.

37. The relative size of a small air force, together with its limited capacity to absorb attrition, makes it especially vulnerable to attacks on its centre of gravity. The first offensive initiative may well be the only opportunity for a small air force to protect its centre of gravity. Therefore, attacking the correct centre using the best method is a critical concept for small air forces to grasp.

Preparedness

38. In order to respond effectively and be ready for the unexpected, an air force must maintain a high level of preparedness. This imperative is critical if the natural advantages of air power are to be capitalised upon. That is, the speed and reach of air power are most effective when used immediately and not after a delay because of a lack of preparedness. An air force must always be able to respond at least an order of magnitude faster than surface forces, otherwise it is squandering its access to the third dimension.

39. Preparedness is comprised of readiness and sustainability, and both of these elements must be addressed if an air force is to be prepared. Maintaining a high level of preparedness has associated costs which the commanders of small air forces must weigh against their primary mission objectives.

Attrition Management

40. Attrition management is as important in peace as it is in war. In times of extended peace, war materiel and manpower must be maintained at an appropriate degree of readiness, but at the same time not be unnecessarily consumed. Small air force fleet sizes mean that the loss of a single aircraft and possibly the crew in an aircraft accident has a disproportionately large impact on the potential war fighting capacity of that unit. In peace, as in war, the commander must decide upon an acceptable rate at which his war fighting assets can be consumed.

41. During a period of armed conflict, the attrition rate is likely to increase and will be related to the pace and intensity of the combat. The risk to the aircraft and crew may be no greater than that experienced by a ship and its crew, for example. However, it is the rate of exposure to the risk that varies significantly. Modern aircraft can be expected to fly two, three or maybe more missions per day, everyday. The nature of maritime warfare on the other hand makes it extremely unlikely that a ship will ever face three full naval engagements in a single day. The skill (and hard decisions) comes in determining if the rate of attrition is cost effective in terms of achieving the campaign objectives, or whether a different strategy is required.

Timing

42. Air power can concentrate its effect quickly in time and space. Therefore, to be at the decisive point at the decisive time, requires exploitation of air power's inherent characteristics, close coordination of supporting elements and an appreciation of timing. Timing is an imperative for all air forces because it allows the initiative and tempo of the battle to be controlled.

43. Concentrating the appropriate force with the requisite sustainment at the decisive point at the decisive time is the art of war. The synchronisation of these four elements is called timing. Again, the limitations of a small air force make timing a critical issue. The force must recognise the opportunity as it develops, and be able to capitalise to best opportunity upon the momentary window of that opportunity by striking decisively.

STRATEGIC DOCTRINE

44. In academic terms, it is convenient to draw a line below the imperatives, and call that the limit of doctrine as it relates to the strategic level of war. The line can never be that clear, as doctrine is a matter of individual interpretation, and all airmen see the issues slightly differently.

SUMMARY

45. In World War One, air power was an expensive, clumsy and inaccurate form of combat power that appeared to offer enormous promise if only it could be mastered. Approaching the turn of the century, air power is now a powerful and versatile form of combat power, that is also an intricate, delicate and finely balanced weapon. The quantum leap in the capability of air power over this period has been made possible by two very different forces. One is technology, and the other is the pursuit of knowledge by airmen. Knowledge encompasses the way in which air power works and may be used to best effect in the future. The essence of this accumulated knowledge and understanding is air power doctrine.

CHAPTER 6

DOCTRINE AND AIR CAMPAIGN PLANNING

Soldiers usually are close students of tactics, but rarely are they students of strategy and practically never of war.

Bernard Brodie.

THE LOST LEVEL OF DOCTRINE

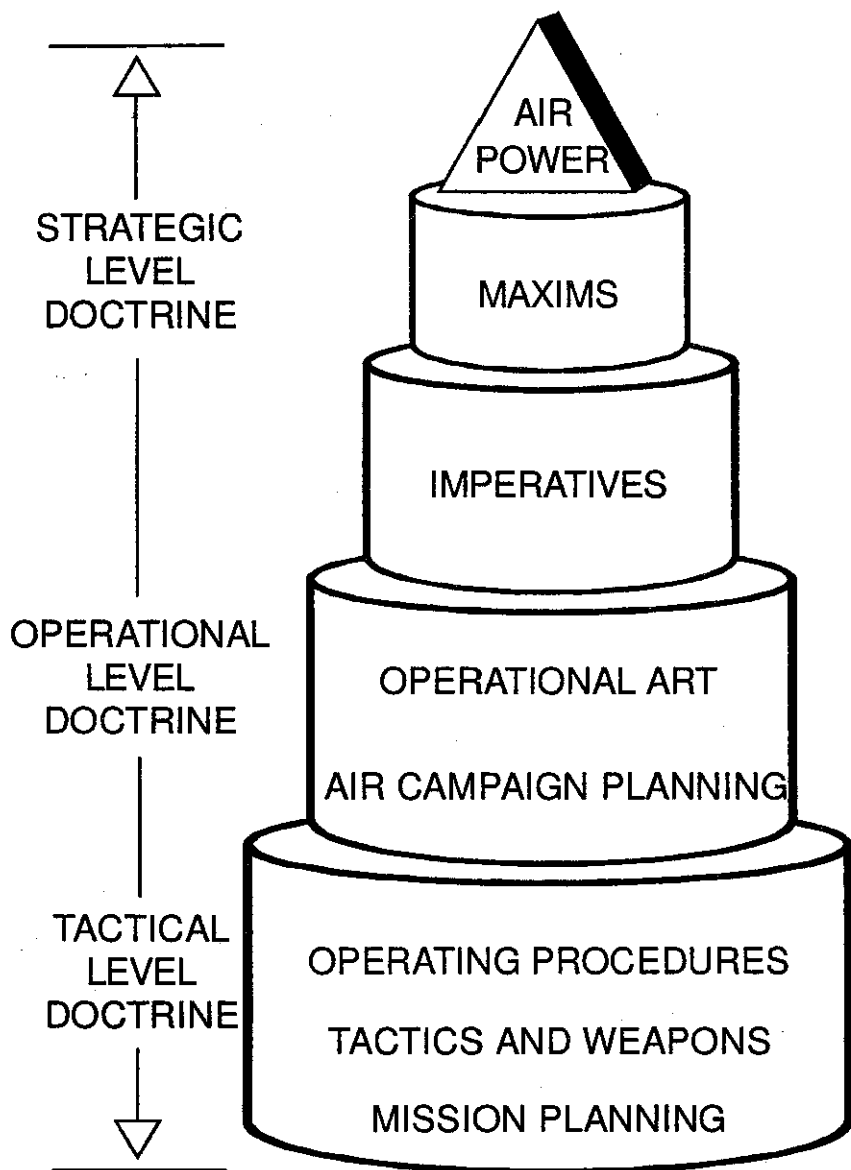
1. The diagram titled 'Levels of Doctrine' (figure 3) illustrates the approximate relationship between the levels of doctrine and an air power hierarchy. Doctrine related to the strategic level of war is paramount and includes the fundamental considerations of air power structure, the maxims and imperatives. Operational level doctrine is associated with the operations in a particular theatre of war. This doctrine is concerned with air campaign planning, the allocation of resources and priorities, and the integration of joint plans. The doctrine associated with the tactical level of war forms the base of the pyramid, and is used in establishing operating procedures, tactics, weapon employment and mission planning.

2. All airmen are comfortable with, and comprehend, the tactical level of air power. Most airmen understand the importance and place of air power at the strategic level of war, and have a grasp of the key issues. Few airmen, however, understand the operational level of war, the associated doctrine and the place of air campaign planning. This is not surprising, especially in small air forces. Although small air forces will have command levels equating to tactical, operational and strategic operations, it is likely that most small air forces effectively operate at only two levels: tactical and strategic.

3. A scarcity of doctrine at the operational level of war and a lack of air campaign planning experience often results in strategic level doctrine and thinking collapsing down on top of the tactical level. In a small air force primarily engaged in peacetime training and small joint or combined operations, this abbreviated structure can be made to work quite effectively. Over a period of time, however, this new structure will blinker the small air force into only thinking and operating tactically.

Levels of Doctrine

(figure 3)



4. The collapsed structure has an attractiveness in peacetime because there is very little demand to maintain battlestaff skills, and it is administratively frugal. The risk is that once the operational level and its function have been reduced, the skills and the true purpose of that level will be lost from the corporate memory.

5. In peacetime, the operational command level of an air force is often reduced to scheduling aircraft movements, and ensuring that the activities of tactical level units are administratively coordinated. The true purpose of that level of command is to fight the air war in a specific theatre with the resources that have been assigned. The essential problem then becomes how to maintain the vitality and expertise of a level of command that is seldom or never tested in peacetime.

6. The operational level is the purview of the air component commander and his battlestaff. The operational level is where the air component commander formulates air campaign plans, refines doctrine for the employment of air force assets, formulates plans to integrate air power into joint operations, and practises the operational art of war fighting. These personal skills are not resident in the position and they cannot be learnt overnight. It is paramount that small air forces fully man and exercise this most critical level of the command structure, because it is from this level that the application of air power is orchestrated. An air component commander and battlestaff must be individually identified so that they may exercise the primary responsibility of that air force: to be prepared for war.

CONCLUSION

7. To develop an understanding of air power and the air environment, one must start with the fundamentals of war and strategic doctrine. In a study of this topic, there is a raft of information available from airmen and strategists alike, which gives the student a wide and balanced perspective. The study naturally leads one toward the operational level of war, and the realisation that the operational level is perhaps the least well understood aspect of air power. This is an issue I hope to address in a future paper.

PART TWO

CHAPTER 7

WAR

The strategist is he who always keeps the objective of war in sight and the objective of war is never military and is always political.

Alfred Thayer Mahan.

POLITICS AND WAR

1. War is frequently described as the continuation of national policy by other means; its sole purpose being to achieve political objectives. War usually results from divergent national interests between protagonists. It is the conflict of interests, with its resultant policies, that shapes and defines the war.
2. Nations protect those interests that they consider vital to national security. This is normally achieved through diplomacy, forming military alliances, propaganda, economic pressure, and very seldom the threat of war. Only in extreme circumstances, and after all other avenues have been exhausted, should the use of armed force result. On occasion, however, a nation with no aggressive intentions may find itself under attack from another nation before the usual diplomatic and economic options have been fully explored. Unlike other political means, once initiated, war usually produces a series of dire consequences that transforms the way of life of the entire nation.
3. The relationship between the political objectives of a nation that have led to war, and the military means to attain the objectives, must be clearly understood. In theory, a nation should promulgate widely and unambiguously a definite, clear and attainable political aim so that subsequent military operations can accord with that aim. Prudence in any use of force to achieve national objectives is politically expedient, morally requisite and legally binding under the Laws of Armed Conflict (LOAC). In war, the enunciated link that exists between political ends and military means should ensure that a purely political or military decision is not made in isolation.

4. Determining a clear political aim is crucial to the conduct and successful resolution of war. In any conflict, the ultimate aim of military forces is victory, but the overriding political aim must be to arrive at a favourable state of peace at the cessation of hostilities.

Armed Conflict

5. The term 'armed conflict' is progressively replacing the word 'war' in the lexicon of the professional military service. Armed conflict better describes the actions in which modern military forces are most often engaged. The new term covers a much wider spectrum of conditions, whereas the classical interpretation of war has legal connotations and limitations in low level conflicts. At this stage the two phrases remain largely interchangeable.

THE NATURE OF WAR

6. War is a complex phenomenon; it is neither ordered nor does it follow a set of rules. Beyond the danger, exertion, fear, uncertainty and chance that permeate warfare, there are four significant components that characterise its nature.

7. First and foremost, warfare is unpredictable and chaotic. Its inherent confusion and uncertainty bring about a condition, generally referred to as the friction of war, that is detrimental to the orderly conduct of that war. Secondly, the actions of war are controlled by the apparently opposite, but in fact interrelated concepts of offence and defence. Thirdly, its outcome depends on the ability to focus on the central element (or centre of gravity) of an opponent while protecting one's own central element. Lastly, irrespective of the type of conflict or the weapons used, the outcome of any war is determined by people. While advances in technological development can influence how war is conducted, technology is not intrinsic to the fundamental nature of war.

The Friction of War

8. Friction of war encompasses those countless factors and incidents, at times minor in isolation, that singularly and collectively tend to reduce the effectiveness and overall efficiency of military efforts. It may be a breakdown in communications that prevents the flow of orders; or the unforeseen design defect that causes weapon malfunctions; or it may

be the unanticipated resistance from a resolute enemy. In sum, it is all the unexpected factors that can quickly change the conditions of warfare.

9. Friction remains an important ingredient in the nature of war. It can never be totally eliminated by human or technical endeavour, and its insidious influence must never be underestimated by commanders.

Offence and Defence

10. Offence and defence are the two interacting components of warfare. Philosophically, the objective of offence is to destroy while the aim of defence is to preserve. Neither can assume absolute primacy in combat; both are continually interacting and, therefore, must be accounted for in all aspects of military operations. Only offensive action can achieve victory; the best that a long-term defensive posture can hope for is to reach a stalemate. There is widespread misunderstanding in western societies of the necessity for and importance of offensive action in executing effective military operations. This misunderstanding is often expressed by politicians, 'peace' groups, and the news media.

11. The Air Environment. In surface warfare, defence has proven stronger because it is generally easier to organise and support logistically than offensive operations, and can be satisfactorily accomplished by less skilful soldiers. This is reflected in the surface commander's rough rule of thumb, in which three soldiers are needed to attack a position for every one soldier that is defending. In the air environment, the traditional surface perceptions of defence and offence do not hold. The three dimensional nature of air warfare complicates the defensive question enormously. The characteristics of air power, together with its additional dimension, result in offensive action being a significantly more effective use of resources than defensive action. The force adopting an offensive strategy can virtually always guarantee being able to concentrate its forces better in space and time than the force defending, thus further increasing their chance of success.

12. Air power is an inherently offensive form of combat power. Thus an air force that assumes a defensive posture automatically handicaps itself. In the air there are no secure flanks, no high ground and no cover behind which to hide, so to hesitate or take a defensive stance and await attack is fraught with danger. Aircraft on the ground and the extensive infrastructure that supports them are both vulnerable to air attack. Historical antecedents suggests that the best way to preserve air power assets is to use them to remove the greatest

threat: generally the enemy's air power. The proverb, 'the best defence is a good offence' could have been written specifically for air power.

Centres of Gravity

13. There are vital elements within a nation or a military force that, in comparison with others, are the most important to continuing and effective operation. These central elements provide the strength and balance to that nation or armed force. Disproportionate havoc will be created if these centres of gravity are destroyed, damaged or lost. Offensive action is directed so that it has the greatest impact on an enemy's capacity and will to continue. It is the centres of gravity, therefore, that must be the focus of offensive action.

14. While an attack on the centres of gravity will be the surest path to victory, it is not always the easiest. Success will depend ultimately on the identification and neutralisation of an adversary's central elements. Of course this means that adversaries are assessing and identifying one's own central elements. Therefore, the defence of one's own centres of gravity is also critical to success.

The Human Factor

15. Wars are fought with machines but they are won by people. In short, war is a human enterprise. It is the human element that is ultimately the decisive factor in battle. Sound leadership as well as highly skilled and courageous personnel operating in cohesive, well-trained units are the essence of the decisive human factor. Proper training, sound doctrine, strong and imaginative leadership, and high levels of readiness and discipline are all human endeavours that should be addressed before any other single factor of the nature of war is considered.

16. The most fundamental and vital task for the military professional is to understand war. Success in the military field, whether in preliminary planning or in the actual conduct of operations, is largely a matter of judgment. Judgment, though partly intuitive, is mainly based on knowledge. All officers should therefore strive continually to increase their knowledge in the profession of arms so that their judgment is soundly based. Other members of the military should also strive to understand war; by doing so they will better appreciate their contribution to the overall military effort.

PRINCIPLES OF WAR

17. There is an enormous wealth of literature and historical data relating to surface warfare. This material has been recorded over the millennia and forms a pool of knowledge from which military commanders have been able to draw guidance. Many great minds: Sun Tzu, Frederick the Great and Clausewitz, to name just three, have recorded and analysed the fortunes of war. Despite all its various forms and mass of uncertainties, there are recognised fundamental principles of war that have stood the test of time. Although each nation generally expresses the principles in different words or different context, the central tenets remain firm. The principles do not guarantee success in battle, but failure to observe them generally accompanies defeat.

18. One of the many sets of principles is listed here but not explained in detail. The principles appear in Chapter 5 where they are considered in an air power frame of reference. The principles of war are: selection and maintenance of the aim, concentration of force, surprise, economy of effort, administration, security, morale, offensive action, *flexibility*, and cooperation.

THE LEVELS OF WAR

19. Warfare is a national undertaking that must be considered, coordinated and conducted in a way that ensures total integration of the effort from the highest levels of policy-making to the basic levels of execution. In relation to its *preparation and conduct*, war is structured along a continuum that divides into four broad areas of activity and planning. The levels of war apply to all wars independent of their size or purpose. For the sake of convenience, doctrine is often categorised according to that level of war to which it is most closely related.

National Strategic

20. The national strategic level of war is the most fundamental aspect of warfare. At this level, political and senior military officials develop a broad conceptual plan that employs the political, social, economic, and military powers of a nation to secure national objectives. At this level of war, the issues relate to the ultimate objective of the war, the

formation of alliances and such like. Indeed, it is at this level that a nation decides whether or not it will engage in conflict.

Military Strategic

21. The military strategic level of war is the employment of defence forces to secure the objectives of national policy by the application of force, or the threat of force. At the military strategic level of war, the Chief of the Defence Force (or equivalent) develops land, naval and air strategies, and assigns commanders and assets to the theatres of war.

22. The military strategic level is important in two respects. Firstly, it sets out the way in which existing defence forces are to be employed at the strategic level of war, and, therefore, helps to determine their use at the operational and tactical levels of war. Secondly, strategic level decisions have a major impact on the development of force structure, that is the shape, size and balance of the front line and its supporting echelons. However, due to political and economic influences, the relationship between the strategic decisions and the force structure is interactive rather than purely hierarchical.

Operational

23. The operational level of war is concerned with the employment of the assigned forces in a theatre of operations in response to the stated military strategy.¹⁹ The commander at this level links the military strategy to the tactical employment of those forces through a campaign or theatre plan that establishes objectives, proportions resources and initiates actions. The operational level of war is where the commander has the greatest influence on the outcome of the battle, and the level that demonstrates the ability or otherwise of that commander. It is this level of warfare that is associated with most of the great military names. In air power for example: Dowding, Harris, Tedder, Coningham, Kenney and most recently Horner in the Gulf War.

¹⁹ The Condensed Air Power Manual, op cit, p 5.

Tactical

24. The tactical level of war is always the most visible level because individual units and sub-units employ tactics and procedures in combat to achieve assigned tasks. Normally the news media reports at the tactical level of war, and as a result the public generally believes that this is where wars are won and lost. It is obviously where the lives and individual battles are lost and destruction occurs, but more often than not the outcome of a war is determined at the operational level.

25. Air Power Perspective. The levels of war are useful tools in the study of war and military organisations, particularly for surface forces. However, the characteristics of air power make it both inherently strategic in nature, and reduce the distinction between the levels of war.

Doctrine and the Continuum of Armed Conflict

26. Armed conflict forms a continuum between global nuclear war and international peace. At the lower end of this scale there is a growing number of largely United Nations sponsored missions of a peacekeeping and peace enforcing nature.

27. The doctrine that guides the employment of air power remains constant across the continuum of armed conflict. The air campaign priorities remain the same, but the relative emphasis changes to reflect the specific needs of the mission. In a benign environment the air support campaign would form a larger proportion of the air campaign plan than the control of the air campaign for example. Control of the air would however, remain the prime air campaign. The objective of any operation within the armed conflict continuum will always demand the equipment and skills developed for war. The challenge is to be prepared to meet whatever situation arises.

ORGANISATION FOR WAR

28. Through a process of evolution, a nation's military forces tend to be organised along the environmental lines of land, sea and air. Each of the arms assumes primary responsibility for the maintenance of combat skills in that environment. World-wide military experience

routinely demonstrates that the most effective application of combat power is through joint operations, where all three services contribute to effective combat power projection.

29. The ultimate purpose of an organisation should be the uppermost consideration in determining its organisational structure. In the case of an air force, this means an organisation designed to conduct wartime operations. To state that one should organise for wartime effectiveness rather than peacetime efficiency ignores the fact that although designed for war, military organisations spend extended periods in peace. Clearly, an air force should organise as it would in war to the maximum possible extent. Where total wartime organisation is not possible, the peacetime organisation should be sustainable, and be designed to make the transition from peace to war swiftly and effectively.

30. In a peacetime environment, the organisational structure of small air forces should not be allowed to develop a combat-to-support ratio that is less than optimal. All efforts must be made to set the combat-to-support ratio where it maximises the air power projection capability of that air force. This does not necessarily mean a wholesale reduction in support activities, as the effectiveness of the combat forces is dependent on receiving the appropriate degree of support. Support activities must be critically reviewed to determine which return the greatest degree of combat-useable support so that air power projection can be maximised.

31. Combat activities should also be included in such a review. They are generally harder to measure and are seldom available from alternative sources. There may, however, be a case where one operational capability is reduced so that another can be increased. These are difficult decisions to make and will have a long-term impact on the viability of that air force.

CHAPTER 8

LAW OF ARMED CONFLICT

The morality of an action depends upon the motive from which we act.

Samuel Johnson

INTERNATIONAL LAW

1. International law is essentially a voluntary code. It emanates from two principal sources: formal agreements (such as treaties) and customary international law. Often domestic law contains enforcement provisions which recognise a nation's international law obligations. If those laws are not observed, the national commitment to moral legitimacy in the conduct of conflict may be prejudiced. To prevent loss of international and domestic support it is essential that combatants and operational planning staff know precisely the legal regime which encompasses their wartime duties.

2. Action in warfare involves the application of deadly force in pursuit of national interests. The individual combatant acts as an agent for the sovereign state which is seeking to impose its authority and will. Inherent in recourse to armed conflict are presumptions of: rationality, proper purpose, and the ability to control the forces unleashed in war. A hallmark of civilisation - as it might be claimed by a state as a national characteristic - is a willingness to accept limits of action in armed conflict; to admit that the means of warfare are not unlimited; and to acknowledge that the concept of legitimacy can prevail in all aspects of conflict.²⁰ The system which exists to regulate conduct in combat is known as the Law of Armed Conflict.

THE LAW OF ARMED CONFLICT

3. The Law of Armed Conflict (LOAC) incorporates the four Geneva Conventions (1949) and the two 1977 Additional Protocols to the Conventions. Nations which have ratified the conventions and additional protocols are required to comply with LOAC which

²⁰ The Air Power Manual, op cit, p 13.

is part of international law. The obligation extends to members of the armed forces. A serviceman who breaches LOAC is liable to disciplinary action under the laws established within that service. Serious breaches may, however, result in prosecutions before a civil court or international tribunal.

Geneva Conventions.

4. The 1949 Geneva Conventions deal with people likely to be affected by war. The conventions relate primarily to the protection of various classes of people from the effects of hostilities, namely: prisoners of war; the wounded and sick in the field; the shipwrecked, wounded and sick at sea; and civilians. The Conventions' main relevance to the combatant is in respect of prisoner of war rights and conditions, and the status of protected persons.

Protocol One.

5. Additional Protocol One relates broadly to international conflicts, including wars of national liberation, and extends and defines the protection afforded to the civilian population in international conflicts. Protocol One is primarily concerned with the protection of civilians, and imposes a number of prohibitions and restraints on combatants. This Protocol also defines the limitations on the conduct of operations, infringements of which are classified as grave breaches and regarded as war crimes.

6. Additional Protocol One also specifies that signatory states must undertake to disseminate the provisions of the Conventions widely, and include their study in military training programs. A special responsibility is placed on commanders who must ensure that members under their command are aware of LOAC and must act to prevent breaches of LOAC. Failure to prevent such breaches could mean a commander would be personally responsible for breaches committed by his subordinates.

Protocol Two.

7. Additional Protocol Two, is a declaration of principles relating to the protection of victims of non-international armed conflict.

INTERPRETATION OF LOAC

8. The Law of Armed Conflict is a code of ethics for the Profession of Arms. Most nations have ratified the LOAC and the two Additional Protocols, and are thus bound by its conventions. The ratification signifies that nation's commitment to principled behaviour even amongst the confusion and anxieties of battle, and regardless of the actions of the enemy. The exact interpretation of LOAC usually varies from one nation to another. The variations from the original document are normally small, and usually relate to specific definitions of combatant status or weapons. Once recorded, they represent a nation's recognised interpretation of LOAC.

Proportionality and Military Necessity

9. The unifying concept that provides the foundation for LOAC is the direct relationship between humanitarian concerns and military objectives. Known as the doctrine of 'proportionality', the concept has been codified in Additional Protocol One to the Geneva Conventions 1977. It states that nations are to refrain from attacks which may be expected to cause collateral damage 'which would be excessive in relation to the concrete and direct military advantage anticipated'. For the combatant, military necessity is the benchmark against which to assess the likely humanitarian consequences of an attack. The concept is vital, as it applies throughout LOAC.

10. LOAC should not, however, be seen as unnecessarily hampering the combatant in the execution of operations. The over-riding unifying principle always applies - that the importance of the military mission (military necessity) determines, as a matter of balanced judgment (proportionality), the extent of permissible collateral or incidental injury to otherwise protected persons and objects. For example, LOAC recognises that the destruction of vital targets has a long-term humane effect if it significantly shortens the conflict.

LOAC and Air Power

11. The nature of air power is such that airmen seldom meet the enemy face to face. Unlike surface combatants, airmen fight an almost clinical war, separated from most of the death and misery by altitude, speed and technology. These conditions do not, however,

excuse the airman from his moral obligation under LOAC to minimise incidental loss of life and collateral damage.

12. In periods of conflict, there will be many situations in which aircraft captains will have to exercise judgment and discretion in poorly defined circumstances and under extreme pressure. While the general provisions of LOAC will be embodied in the prevailing Rules of Engagement (ROE), there may be occasions where decisions have to be made from first principles, based on an understanding of LOAC.

13. Aircrew should not deliberately be sent into action in such a way as to contravene LOAC. However, aircraft captains must be able to exercise judgment during combat. If the character of a target was found to be different from that assumed in planning, then a decision would have to be made which would take into account, among other considerations, the provisions of LOAC. Similarly, crews engaged in armed reconnaissance must be aware of the legal implications when deciding whether to attack a target of opportunity.

14. It is not only aircrew to whom LOAC applies. Every member of an air force is a combatant. Technical and other support personnel will have secondary combatant duties. Units in some areas may have to receive prisoners of war or detainees and care for them until they can be handed over to the appropriate authorities. All such actions must be completed in accordance with, and demonstrate respect for, the provisions of LOAC.

15. By far the largest proportion of LOAC issues will arise and should be solved in the planning stage of an air campaign. This is particularly the case with target selection and weapons employment, which should reduce the workload on the aircrew in the critical phases of their missions.

SUMMARY

16. Clearly, the nature of air warfare presents all air force personnel with LOAC issues that must be addressed. Both the Service's reputation and its claim to professionalism are directly related to the level of understanding each member has of LOAC codes. Accordingly, personnel at every level in every unit need to know both the general character of LOAC and specific provisions related to the air power operations in which they may be involved.

CHAPTER 9

RULES OF ENGAGEMENT

If we should have to fight, we should be prepared to do it from the neck up instead of from the neck down.

General Jimmy Doolittle.

INTRODUCTION

1. The wars in which democratic nations have engaged have been fought for political, not military ends. It is therefore, critical to acknowledge that the way in which military force is applied is a political issue, and that military objectives will always remain subordinate to political objectives.

2. When directed to conduct operations, a defence force works within the guides of two sets of different rules. The first set is the Law of Armed Conflict (LOAC), and the second set is the Rules of Engagement (ROE), promulgated by the Chief of the Defence Force (or equivalent) after consultation with the government. LOAC is essentially a code of ethics for combatants, non-combatants and civilians alike; it is primarily humanitarian in nature, has a wide degree of acceptance, and is observed by virtually all nations.

RULES OF ENGAGEMENT

3. Rules of engagement are abbreviated decision-making models that relate directly to the application of force; they are primarily political in origin, but need to reflect military necessity. The rules set the conditions under which a defence force would initiate or continue combat. The rules define the degree and the manner of force which may be applied and specify the limits within which a commander can act. They do not, however, inhibit or replace the command function. ROE are not the same as, and should not be confused with, the Law of Armed Conflict. The rules are directives that a nation selects and imposes upon its own military forces to govern the employment of that country's combat power.

4. More importantly, ROE are the means by which a nation ensures its military activity aligns with its current political objectives, and are thus designed for a specific time and place. The rules are the mechanism through which the government and key military commanders exercise control over the actions of the fielded forces. ROE are created to control the employment of military force in line with diplomatic objectives, and to ensure that a strictly measured but flexible national response is available in any circumstance. Whereas LOAC is essentially fixed, ROE are flexible and can be quickly changed to better reflect the current threat or desired political posture. Thus, well defined rules of engagement play an integral role in military operations.

Formulating Rules of Engagement

5. A wide range of factors combine to influence the shaping of ROE. The main influences are: international and domestic laws, political and military policy guidance, operational considerations and diplomatic factors. As the relative importance of each of the factors changes, the new national position will be reflected in different rules of engagement.

6. Given that military forces are ultimately engaged in a political endeavour, it is crucial that politicians understand the scope of the LOAC and the place that rules of engagement play in controlling the application of military force. They must also be made aware by senior commanders, of the interaction between their political desires and the practicalities of military operations. To this end, commanders should not suggest military solutions to political problems until the national political aim has been finalised. It has often been the case where ill-considered political direction has initiated military action, before the political aim has been identified. Recent history suggests that military success is more likely to follow military interpretation of political objectives, than follow a political selection of military options.

7. Assuming that national political objectives have been determined, both politician and military commander should collaborate to select the rules of engagement within which the military forces can both operate and achieve the desired national objective. All subsequent planning should be left to those with the appropriate expertise. If the political objective changes, or the military situation is such that the ROE prove to be unworkable, then further consultation will be required.

8. ROE should never include subjective or conditional clauses such as 'minimise the risk to civilians'. Such wording abrogates responsibility and forces decisions down the

chain of command, until they finally rest with the soldier or airman who is in the most time critical and life threatening part of the process. The decision-making and the responsibility for ROE need to be made and held at the highest levels during the formulation and campaign planning stages.

Application

9. Although the formulation and interpretation of ROE is controlled at the highest level, all levels of the command chain have a responsibility to ensure that the ROE is both workable and observed. The forces in the field must be aware that the command chain above them has handed down the best and most flexible rules that will achieve the national objective and simplify their task.

10. Decision times in the field are often extremely short. The soldier or airman is not in a position to consider all the factors which may influence the decisions he or she will have to make. The combatant needs a set of short, concise and unambiguous guides that simplify the decision-making process. It is the responsibility of the command chain to ensure that subordinates have at their disposal ROE that will allow them to conduct their mission without unnecessary exposure to undue risk.

Military Necessity, Humanity and Proportionality

11. An understanding of LOAC is central to the selection of appropriate ROE. Of particular importance are the concepts of 'military necessity', 'humanity' and 'proportionality'. It is essential that, within the air power doctrine, these issues are addressed and settled before ROE is selected. The principles of military necessity, humanity and proportionality should be utilised during the planning stage by the commander to achieve specific operational, political or diplomatic purposes.

12. For example, under LOAC, the responsibility for protecting non-combatants within a war zone lies with the attacker, the defender and the non-combatants themselves. Although an attacker may not specifically target non-combatants or civilian objects, a defender may not conceal or shield military targets from attack by moving them into civilian populated areas or near protected objects. Under customary practice, non-combatants must exercise reasonable precaution to remove themselves from the vicinity of military objectives or

military operations.²¹ While LOAC prohibits intentional attacks on non-combatants and civilians, it does not prohibit operations that may cause collateral damage or death. Thus, while civilians in the vicinity of a legitimate military target may not be attacked directly, they are at risk of death or injury. The responsibility of determining appropriate targets and their likely effect on non-combatants and civilians lies with the planning mechanism. The end user of ROE, the aircrew in the case of air power, should only be responsible for target identification and delivering the ordnance as accurately as practicable.

13. The concept of proportionality does not restrict a nation from using its weapon systems to their fullest capabilities, nor indeed should ROE unduly constrain the use of force.²² Proportionality requires a nation to refrain from intentionally targeting and employing weapons against civilians who are not involved in the hostilities and prohibits the intentional attack of their property. The concept recognises that collateral casualties and damage to private property may inevitably occur during combat operations, and only stipulates that combatants use ordinary care to minimise such occurrences.

Warning

14. The element of surprise plays a significant part in battle. Within the LOAC, an attacker is not obliged to give a warning and thus compromise the advantage of surprise. To this end, ROE need not include a warning of the intended action. Rules of engagement that expose aircrew to a greater degree of risk in order to issue a warning or accommodate collateral damage considerations, reflect poor ROE development and target selection parameters.

Judgment

15. No set of rules, no matter how extensive or how carefully considered will ever cover all possible contingencies. Thus, there is an element of judgment that must be applied at the user level when the circumstances do not fit the anticipated conditions. Consequently, the fielded forces must also have a basic understanding of the LOAC. Should a serviceman

²¹ Humphries, Lt Col John G., USAF, Operations Law and the Rules of Engagement in Operations Desert Shield and Desert Storm, Air Power Journal, Fall 1992.

²² loc cit.

then be put in a position where the extant ROE is not applicable, he or she can derive appropriate behaviour from their knowledge of LOAC.

16. Right of Self-Defence. Individual judgment is often called into question with respect to the matter of self-defence. It is inherent in the law that a military unit does not need to be subjected to an attack before taking defensive or offensive action. ROE must always recognise the responsibility and duty of the commander and the individual to exercise the right of self-defence. Whether or not the right of self-defence is stated in the ROE, an individual or group is responsible to defend itself from an imminent threat.

Legal Advice

17. Although commanders will have a working knowledge of LOAC, it is advisable to have legal representation available during the formulation of ROE, and at those times when interpretation of LOAC is required. The aim of both combat and legal staff is to produce ROE that is both applicable in the field and valid in law. Legal advice should not be seen as constraining the scope of operations in the planning process. The military legal adviser is obliged to ensure that the rules of engagement are no more restrictive than the law requires.

18. In the formulation of ROE, for example, legal advice will assist in the definition and interpretation of terms such as hostile intent and hostile act. The contribution from the experienced commander will be to put these concepts into practical terms of field procedures and the limitations of weapon systems. From this exchange of knowledge, both sides of the planning team will be able to work together to develop rules of engagement that are tactically sound, legal and achieve the desired political objective.

RULES OF ENGAGEMENT AND AIR POWER

19. Although not unique, special consideration should be given to the development of air power related ROE, and the relationship between targeting and ROE. The nature of air power is such that an enormous destructive potential is concentrated in the hands of a few technically skilled but not necessarily experienced officers and SNCOs. This, together with the frantic pace of modern aerial warfare, means that particular attention must be paid to the ROE developed for use in the air. Ideally, ROE at the tactical level, should be limited to no

more than four simple non-conditional statements. The hard decisions should be taken on the ground during the planning and target selection process. It is here that the link between the legal advisers and the commanders who will determine ROE and targeting requirements needs to be robust and routinely exercised.

SUMMARY

20. Rules of engagement are conditions that apply to the use of military force. The purpose of the rules is to ensure that the actions of that force are consistent with national political objectives. In addition to achieving political goals, the rules must also reflect the legal requirements of the Law of Armed Conflict. In some cases, the application of particular elements of LOAC may be reinforced with specific ROE. As a wide range of factors influence the selection of the ROE, they should be formulated at the highest possible level within the military structure. Once promulgated, however, the application and observation of ROE is the responsibility of the entire military structure. The effectiveness of combat forces is maximised if the ROE that they are working under are simple and do not hinder normal operational procedures.

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