ROYAL AUSTRALIAN AIR FORCE
AIR POWER DEVELOPMENT CENTRE

Working Paper
09

Initiating a Coherent Approach to the Development of RAAF Space Doctrine

by Dominic Sims

FOREWORD

Space based systems have become so common place in our lives that we often take the capabilities they offer for granted. Commercial communications, navigation and imaging systems, to name just a few, provide us with a view of the world not previously experienced. Yet, our complacency with commercial systems should not read over to the military application of space-based assets. While Australia does not presume to utilise space for the application of force, our military capabilities are becoming more dependent on space based information systems. Space has conclusively become a part of modern military competencies and is vital to the successful employment of national power.

Yet, as space embeds itself more and more in our very way of operating, we have not yet comprehensively addressed the key issues of how space impacts upon us organisationally and doctrinally. While space remains in its infancy within the ADF, it is important for the Services to begin to recognise the role that space will play and how it will shape our future doctrine. At the moment there is no clear-cut ADF space doctrine but the need to articulate one is becoming increasingly important.

This paper discusses the importance of space and its utilisation as a medium of warfare and is offered to stimulate broader interest and debate regarding the importance of space and its military applications.

ABOUT THE AUTHOR

SQNLDR Dominic Sims is currently working in the Future Space Concepts Office in Air Headquarters. He graduated from ADFA in 1989 and completed an Aeronautical Engineering degree at the Royal Melbourne Institute of Technology in 1990. He spent 1991 completing various Air Force engineering and armament courses and was posted to the Aircraft Research and Development Unit in Jan 1992 as an armaments test engineer. During this tenure he was involved in a number of weapons test programs for F/A-18, F-111 and P-3 aircraft. In 1994 he was posted to Aircraft Stores Compatibility Engineering with ARDU where he was responsible for stores certification activity on F/A-18 aircraft. In late 1996 he was posted to the USAFEX1 exchange position in the USAF SEEK EAGLE Office at Eglin Air Force Base in Florida. During the period Dec 1996 through Dec 1999 he managed A-10 and F-15E stores certification activities within the SEEK EAGLE office. He returned to Australia in 2000 on promotion to SQNLDR and was posted as the project engineering manager for the AGM-142E acquisition project. SQNLDR Sims attended Australian Command and Staff Course (ACSC) in 2002.

Space Power will be as decisive in future combat as air power is today.

The Honorable E.C. Aldridge, Jr., 1998[1]

Cost currently prohibits the RAAF from exploiting the space environment

Fundamentals of Australian Aerospace Power, 2002[2]

INTRODUCTION

The release of the latest edition of AAP1000, *Fundamentals of Australian Aerospace Power*, is the latest iteration of RAAF single service doctrine. Despite an increasing reliance on the space environment for support of its day to day operations, the RAAF acknowledges space only in passing in its capstone doctrine. To the sceptical reader this latest release of doctrine seems to have addressed the increasing importance of the space environment by the simple expedient of replacing the term 'air power' with 'aerospace power.'

Development of a robust RAAF doctrinal approach to space is essential. The space environment represents an ever-increasing domain for human activity. Most nation states and many non-state organisations now operate in and/or utilise services provided via space based systems. Many of these groups see space as an essential contributor to their on-going prosperity and security. As with all environments that offer the possibility of gain, space will increasingly become another arena for human competition. It will also continue to provide enabling support to ongoing competition in terrestrial environments.

These competitions will take many forms: commercial, economic, scientific, and most certainly military. Accordingly many organisations are attempting to understand the space environment and ensure that they are able to guarantee continued utilisation of space for their own benefit. Foremost amongst the space-faring nations at the present time is the US. The US understands its dependence on space and is directing considerable efforts to ensure that it is able to exploit the space environment to the maximum of its ability. An integral part of these efforts is development of current and comprehensive space doctrine for its military forces.

Accordingly it would seem wise then for the RAAF to be pursuing the development of space doctrine. Yet Chapter 10 of AAP1000, described as a discussion paper proposing possible future influences on doctrine, assesses space doctrine development in a somewhat cursory manner. If anything, Chapter 10 seems to indicate that space doctrine has for the time being been placed in the too hard basket, and will be examined by the RAAF in five to ten years time.

Put bluntly, the approach to current space operations doctrine and doctrine development presented by the RAAF in the AAP1000 is inadequate. The RAAF must start developing its professional understanding and mastery of the space environment now. This will better allow the RAAF to assess the impacts of space, now and in the future, on RAAF aerospace power. Development of this organisational understanding is immutably linked to the instigation of a coherent approach to the development of space doctrine for the RAAF.

This paper will review and analyse current doctrinal writings from a number of different sources regarding the use of space. It will then assess the applicability of these writings to the RAAF with the intent of proposing a number of actions that will stimulate space doctrine development within the RAAF.

AIM

The aim of this paper is to propose the initiation of a coherent ADF/RAAF approach to the development of space doctrine.

Doctrine Defined

Doctrine is the description of an organisation's belief of the correct way of doing business. This belief is derived from fundamental principles, innovative thinking and experience. As stressed in AAP1000 and other ADF doctrine documents, doctrine is authoritative guidance, but requires judgement in its application. It is, by its very nature, subject to questioning and revision in the face of ongoing critical analysis and experience.

AAP1000 states that RAAF doctrine is developed for and applied at the strategic, operational and tactical levels of warfare.[3] Strategic ADF doctrine is detailed in the Australian Defence Doctrine Publication (ADDP) – Foundations of Australian Military Doctrine.[4] Under this capstone document are joint and single service doctrines. RAAF operational doctrine is described in the Operational Air Doctrine Manual.[5] Tactical doctrine is developed at a wing level and is promulgated in Australian Defence Force Publications and specialist group/wing standing instructions.

Although not formally part of the doctrine heirachy summarised above,[6] AAP1000 assumes the role of single service strategic doctrine. The document also acknowledges that it applies across the operational and tactical levels of war. It thus influences and directs operational and tactical doctrine development. These levels of doctrine are hierarchical, with development and execution of doctrine at one level carried out in accordance with the principles of the next higher level of doctrine. Thus, evolution of doctrine at the strategic level will have flow-on effects to doctrine at operational and theatre level. The response of lower level doctrine to changes in higher level doctrine will of necessity be subject to a time lag to account for education, debate, publishing and other process inputs necessary for robust doctrine development.

It is this doctrinal inertia that mandates that strategic level doctrine such as that in AAP1000 be as responsive and forward looking as possible. This will go some way to ensuring that in future, to paraphrase Sir Michael Howard, RAAF doctrine is not 'too badly wrong when the shooting starts.'[7] With this in mind current doctrinal shortfalls in AAP1000 with regards to space doctrine represent a deficiency that must be corrected as soon as possible. This will allow subsequent operational and tactical level doctrinal development to proceed.

AAP1000 – Fundamentals of Australian Aerospace Power

As the latest iteration of the RAAF doctrine, AAP1000 represents a logical evolution of RAAF air power doctrine. The format of the doctrine was deliberately chosen to provoke debate and make doctrine more accessible to all personnel. AAP1000 is described as having two fundamentally different sections. The first section, comprising the first nine of the ten chapters, defines RAAF doctrine. The second section, consisting solely of chapter 10, is a discussion paper proposing possible drivers in the future that will influence the development of doctrine in the coming years.

To view AAP1000 as an acceptable level of doctrinal guidance towards exploitation of and operations in the space environment is not possible. AAP1000 does make passing reference in a number of instances to space. As an example, Chapter 7 recognises the roles of Offensive and Defensive Counter Space amongst the more traditional air power roles.

This acknowledgment of these space roles and RAAF acceptance and understanding of the associated implications is however very brief. The majority of the text provided is quoted directly from the USAF Basic Air Force Doctrine document.[8] While pertinent in providing a synopsis of USAF doctrine, it is inadequately linked to the implied doctrinal guidance for the RAAF.

The actual doctrinal guidance provided by AAP1000 in this instance is limited to comments on a possible future need for an indigenous space capability in light of increasing reliance on space based communications and intelligence systems. As strategic doctrinal guidance this represents neither fundamental principles on the

role of space in the RAAF, or a current understanding of how the RAAF is to use and interact with the space environment.

Overall AAP1000 pays lip service to the acknowledgment of space as a driving factor in formulating current strategic doctrine. The use of the term 'Aerospace Power' in place of 'Air Power' is at best an oversimplified assumption that previous doctrine can account for space through the simple expedient of a name change. This approach is evidenced in the opening paragraph of chapter one. The expression aerospace power is used in the first sentence of the doctrine. The next sentence then goes on to imply that the term is applicable within the atmosphere only. Similar implications occur throughout the body of the doctrine.

The doctrine goes on to faithfully use the term aerospace power in all discussion of current doctrinal aspects, while using the term air power in discussion of past doctrine and examples. Nowhere does it clearly state when and why the change from one term to the other occurred and what is meant by the changed terminology. It is interesting to note that the USAF, as the lead space service of the pre-eminent space power of the moment, initially used the term 'aerospace power.' It now makes a very clear point of differentiating between air and space power.[9]

USAF Space Doctrine

The basic USAF strategic level doctrine is promulgated in AFDD 1, Air Force Basic Doctrine.[10] The document explicitly states that air and space power doctrine, while immutably linked at the strategic level, need to be clearly differentiated due to the clear environmental divide between the two. It is upon this strategic level guidance that the USAF has developed and continues to refine operational space doctrine.

USAF Operational level doctrine for space is documented in AFDD 2-2, Space Operations.[11] The structure of this doctrine is broadly similar to that used in the RAAFs own AAP1002.[12] Guidance is provided on fundamental principles of space operations, followed by command and control, planning and execution guidelines. A noticeable departure from the structure of AAP1002 is that an additional section that details training and education requirements to support space operations concludes the USAF doctrine. This emphasis on an active professional education program is a foundation upon which USAF professional mastery of the space environment is based.

USAF space doctrine appears to be the most mature space doctrine in existence at the current time. The doctrine is intended to allow the USAF to ensure space control. Space control implies that the USAF will be able to deny the use of space assets and services to an opponent while ensuring full and uninterrupted US use of the space environment. It is a doctrine that has evolved in the decade since the Gulf War. With poorly defined space doctrine in place at the start of the Gulf War, US military space operations were 'very much a come-as-you-are and make-it-up-as-you-go-along affair.'[13] Since then, and driven by that experience, USAF space doctrine has been developed continuously to ensure integration of space into the Air Force and the US military as a whole.

USAF space doctrine seems to be a logical starting point in garnering ideas for the development of RAAF space doctrine. Given the high level of US space dependency it is understandable that USAF doctrine is going to relate to strategic guidance and policy different from that of the RAAF. Similarly, the doctrine has been developed based on past, current and forecast USAF space capabilities, all far in excess of anything the RAAF is likely to acquire. Why then is it advisable that the RAAF, a relative non-entity in the space power world, start its search for doctrinal enlightenment with the USAF space doctrine?

RAAF Space Dependency

The RAAF, and in fact the entire ADF, is similar to the USAF in having a considerable, and growing, dependency on space based services. A broad-brush approach to listing some of the dependencies of the RAAF will include dependence on the US Global Positioning System (GPS), USAF and US National Reconnaissance Organisation sourced imagery and military satellite communications. Such services are, however, only the tip of the space dependency iceberg. The true extent of the RAAF dependency on the provision of space based services is probably unknowable. Routine communications are sourced from commercial providers routing

via commercial satellites, imagery is purchased from commercial or foreign owned satellites, weather data is sourced from foreign owned weather satellites. All of these factors represent dependencies the RAAF does not currently fully understand. We appear to be in a similar situation to the US forces at the start of the gulf war – aware of a dependency, but with little doctrine in place to refer to in time of need.

Other challenges that the RAAF needs to account for mirror the above dependencies. Potential opponents are now able to draw on a growing supply of space based enabling services similar to those used by the RAAF. Pertinent examples of these services include the growing commercial satellite imagery market. The implications of commercially available imagery with strategic, operational and tactical utility will have considerable impact on future RAAF doctrine development.

The dependencies and challenges described represent vulnerabilities at strategic, operational and tactical levels. Future opponents will in all likelihood view any space capability contributing to military capability as part of the forces arrayed against them and as such a valid, targetable centre of gravity.[14] It is increasingly important that the RAAF develop an understanding of these vulnerabilities. Without this understanding the RAAF will be ill prepared to defend itself against attacks targeting the dependencies we have in the space environment. In the same vein the RAAF will also be unable to fully exploit the space-based vulnerabilities of potential adversaries.

RAAF Space Doctrine Development

As stated in ADDP-D, doctrine is developed from a number of contributing sources. It is a body of thought on the nature, role and conduct of conflict. This body of thought is developed from experience and reasoned extrapolation of the history of conflict and attempts to account for contemporary and emerging factors that will alter the context of these lessons from history. This body of thought must be sourced from those who have some level of professional mastery in the field being examined.

Similarly, AAP1000 emphasises that, no matter how sound doctrine may be, it is only effective if applied correctly by expert practitioners who understand the:

- Lessons of history
- Contribution of the theorists
- Influence of culture
- Implications that new technology may bring to bear on the task at hand
- Context in which these new practitioners are required to operate AAP1000[15]

Thus a clear first step in developing sound doctrine in any field is to ensure that an organisation is developing expert practitioners. This however does not refer solely to a small elite of highly educated personnel. Rather, an organisation must ensure that it has a wide-ranging level of expertise across all of its personnel.

With the AAP1000 guidance in mind, it is unrealistic to expect that foreign doctrine can be adopted wholesale and expected to meet RAAF needs given the very different context that the RAAF will apply to space operations. Similarly it is not feasible to expect the relatively small cadre of space trained and educated RAAF personnel to develop a mature space doctrine for the RAAF. Space doctrine, like all current RAAF aerospace doctrine, must represent a distillation of the thoughts and experiences of the whole Air Force. To facilitate this, the professional mastery of all RAAF personnel must include some increased level of understanding of the space environment. Thus developing a corporate understanding of space and its implications for aerospace operations is an essential enabler for the future development of RAAF space doctrine.

Educating the Workforce

To this end the RAAF must undertake the development of a space aware and educated workforce that will be able to conduct critical analysis of the impact of space on RAAF operations. A coordinated approach to educating RAAF personnel will need to address space operations in general and RAAF specific space dependencies and vulnerabilities. Training will be needed to allow application of this knowledge in daily

operations and exercises. This training and education effort will of necessity require considerable effort to initiate and maintain. It will also need to be rapidly adaptable to respond to changing, and hopefully maturing RAAF space training needs.

In developing a space education and training campaign the RAAF must ensure that it has a sound understanding of the training resources currently available within the Australian Defence Organisation (ADO). The ADO currently runs a number of applicable space related training short courses. RAAF visibility of the complete spectrum of courses available is, however, constrained. This is due to a number of factors. Many of these courses have been developed in response to a specific need from individual organisations, with little course publicity provided outside the customer organisation. Similarly, many organisations do not fully understand their space dependencies and do not actively pursue space education and training for their personnel.

In an attempt to address this situation, the Defence Space Directorate[16] is currently conducting a survey of Australian sourced space training. Defence space is intending to coordinate these training activities and ensure dissemination of course availability is more effective across the ADO. At the same time the directorate has initiated a number of measures to increase the breadth of space education within the entire ADO. An annual seminar on space operations has been initiated to promote an appropriate forum to host space related discussion. Similarly, a pilot 'introduction to space operations' course is in development to provide initial general training for defence personnel. This course, in its pilot form, is a week-long course and is intended to be run on an as needed basis.

The RAAF must ensure it becomes involved in this training development process. Involvement will ensure two major benefits to the RAAF. Firstly, it will provide increased visibility to the RAAF of the space training capability within Australia. Secondly, it will allow the RAAF to monitor and influence the quality and type of training developed in the coming years to ensure that the training is appropriate for RAAF needs. Consideration should also be given to including a basic level of space awareness education during initial training of all new entrants into the RAAF.

Due to resource constraints this education process must be carried out as efficiently and effectively as possible. The RAAF needs to identify those organisations and units that would most benefit from increased levels of space training. By default this will also represent the most effective means of developing the experienced personnel base required to support robust doctrine development.

A Coordinated Approach

Combined with the increased level of training proposed, the RAAF must also devote some effort to a more coordinated approach to understanding its current dependencies on and vulnerabilities to space operations. This will in turn drive development of training needs. Development of this understanding will be a gradual process. Understanding of space dependencies will need to occur at strategic, operational and tactical levels. At a tactical level increased space awareness will serve to educate personnel as to the capabilities of space. These personnel must in turn be encouraged to critically analyse their daily operations in the context of space dependencies and vulnerabilities and develop mitigating practices accordingly.

At both strategic and operational levels a similar process needs to be initiated. Commanders and staff in joint and single service headquarters need to consider and review space-related impacts on their roles and activities. From this increasing level of awareness it can be expected that an increased level of experience and critical analysis of space operations will begin to emerge. The Future Space Concepts (FSC) office has already initiated this style of activity during a number of operational planing exercises with RAAF units.

Currently there is no central coordinating agency within the RAAF to monitor, coordinate and oversee RAAF space activity. A number of agencies within the RAAF, and the larger ADO, focus on specialist space areas, including space imagery, satellite navigation systems and satellite communications. These agencies represent considerable knowledge bases within their fields. While a major restructure of the ADO to bring these agencies under the purview of a 'space command' style organisation is outside the scope of this paper, it would appear that considerable synergies are possible via the initiation of a coordinating agency to better collate and assess

the roles, activities and impacts of these organisations. The coordinated input of these organisations is also an essential part of developing an improved understanding of RAAF space dependencies.

Accordingly, the nomination of a single organisation with the responsibility and authority to assess current RAAF space dependencies, current space related projects and current training availability levels should be the first response to meeting the need for increased space education. Given the constraints of manning and funding currently in place within the RAAF this responsibility would need to be assumed by an existing organisation. Given its role as the only dedicated space centre of expertise, the FSC Office within the Battlespace Management (Aerospace) directorate seems to be the most suitable organisation to assume initial responsibility for this task. Reassessment of the appropriateness of this tasking would be required on a regular basis in light of ongoing FSC taskings.

Increased education of the RAAF workforce and an improved corporate understanding of space dependencies represent important steps towards developing mature doctrine in the long term. These are undertakings, however, that will require a longer timeframe to implement. There are a number of other initiatives that can be undertaken in the shorter term.

Cooperation and Liaison

Foremost amongst these is to ensure that the RAAF, in the guise of the FSC office, maintains close and ongoing liaison with the Defence Space Directorate. Apart from the space training development activities described previously, the Defence Space Directorate is undertaking several tasks that will directly impact RAAF doctrine. Most notable is the increased level of strategic and governmental guidance towards space activity that is being pursued by the directorate. This will, as a matter of course, shape the development of ADF doctrine, of which RAAF single service doctrine is a part.

Closer coordination between the Aerospace Centre and the FSC office will also be necessary in future doctrine development. This coordination should be at an informal level, but actively pursued to ensure that both organisations are aware of ongoing developments in their respective areas. Current Aerospace Centre involvement with development of the ADF's Future Warfighting Concept[17] (FWC) family of concepts is a current example of doctrine development that will benefit from increasing inclusion of space operations experience and practices.

With this liaison in mind, both organisations should initiate ongoing debate as to the relevance of foreign military space doctrine development to RAAF space doctrine. As a starting point, given the acknowledgment that Australia's alliance with the US is one of our greatest strategic assets, and that the US is our strongest ally, it is essential that the RAAF understands USAF space doctrine.[18] Such understanding will also be essential to enable more effective participation in coalition operations.

In addition to analysis of US doctrine, further study and analysis of the space doctrines of other militaries, such as those of Great Britain, Canada, France, Germany and Israel, should be ongoing. These studies can be expected to provide further guidance to doctrine development in the short term, as well as further developing the RAAFs understanding of space training and education.

Conclusion

The RAAF is well aware of the growing impact of space on Air Force operations. This is amply demonstrated by the very overt usage of the expression 'Aerospace Power' in the latest edition of AAP1000. This takes the place of the more traditional expression of 'Air Power' in earlier editions of the document. This acknowledgment of space is an encouraging first step in doctrinal evolution for the RAAF.

Yet it is only a first step. The overall acknowledgment of space in AAP1000 is less than comprehensive. Although describing space as an important factor in some areas of the doctrine, the overall doctrine still tends to emphasise atmospheric based capability as the subject of the doctrine. This is understandable as the RAAF has yet to experience a cathartic event, such as the USAF did during the gulf war, to drive the organisation towards development of comprehensive space doctrine. In the absence of such an external driver the RAAF must make a conscious decision to embark on the development of space doctrine.

Robust doctrine development and application is dependent on the presence of expert space practitioners within the RAAF. Currently space education and the associated development of expert practitioners is not coordinated and limited to a relatively small cadre of personnel within the RAAF. To overcome this the RAAF must initiate a training program to provide some level of space operations training across a broad spectrum of its personnel.

To ensure that this training is developed and applied in the most effective manner, the RAAF must also undertake to better understand the impact of space on its operations. The RAAF must ensure that a central coordinating agency is able to monitor and understand overall RAAF space dependencies. From this understanding initial training may be provided in those functional areas where the most benefit would be gained. This in turn should lead to greater levels of operational experience being developed. The RAAF will then be able to ensure that further doctrinal development draws on these increasing levels of education and experience.

Concurrent with the above the RAAF needs to ensure that it closely monitors other factors that will influence future development of doctrine. There are many factors that will contribute to future doctrine, including evolving ADO and government space policy and strategy, as well as the ongoing evolution of space doctrine of other armed forces from around the world.

Recommendations

Recommendations from this paper are that the RAAF should:

1. undertake to determine current and future space dependencies of RAAF operations. The FSC office should be the organisation tasked with the initiation of this process. Continuation of this activity should be reassessed in light of initial findings;
2. initiate the development of a space education and training program based around the Defence Space directorates consolidated list of domestic Australian space training courses. FSC should be the organisation tasked with drafting an implementation plan for the development and application of this program; and
3. ensure that space specific doctrine development is actively promoted as part of the overall doctrine development process. The Aerospace centre should be tasked to ensure active and regular engagement with the FSC office and the Defence Space Directorate to ensure involvement of the maximum level of space experience is involved in future doctrine development.
4.

ENDNOTES

[1] Air Force Doctrine Document 4, 1996, Space Operations Doctrine,

Headquarters Air Force Doctrine Centre, Maxwell AFB, p. 3

[2] Australian Air Publication 1000 (AAP1000), 2002, Fundamentals of Australian Aerospace Power, Fourth Edition, Aerospace Centre, Canberra, p. 291

[3] AAP1000, *Ibid*. p. 14

[4] Australian Defence Doctrine Publication, 2002, Foundations of Australian Military Doctrine, Australian Defence Headquarters, Canberra

[5] Australian Air Publication 1002 (AAP 1002), 1999, The Operational Air Doctrine Manual, Headquarters Air Command, Glenbrook

[6] AAP1000, *Ibid*. p. 18

[7] Howard, M. 1974, 'Military Science and the Age of Peace,' Journal of RUSI for Defence Studies, Vol 119, p. 7

[8] Air Force Doctrine Document 1 (AFDD 1), 1997, Air Force Basic Doctrine, Headquarters Air Force Doctrine Centre, Maxwell AFB

[9] Jumper, J. 2002, A word from the Chief, Air and Space Power Journal, Fall 2002, Maxwell AFB

[10] AFDD 1

[11] Air Force Doctrine Document 2-2, 2001, Space Operations,

Headquarters Air Force Doctrine Centre, Maxwell AFB

[12] AAP 1002

[13] Khalilzad, Z. Shapiro, J. (eds), 2002, Strategic Appraisal: United States Air and Space Power in the 21st Century, Rand Corporation, Washington, p. 155

[14] Kalilzad, Z. *Ibid*.

[15] AAP1000, *Ibid*. p. 8

[16] The Defence Space directorate within the ADO now comes under the purview of the Head, Policy, Analysis and Guidance Division at ADF HQ.

[17] Department of Defence, 2002, Future Warfighting Concept, National Capital Printing

[18] Department of Defence, 2000, Defence 2000 – Our Future Defence Force, Defence Publishing Service, Canberra, pp. 34 - 36

BIBLIOGRAPHY

Air Force Doctrine Document 1, 1997, Air Force Basic Doctrine, Headquarters Air Force Doctrine Centre, Maxwell AFB, Alabama

Air Force Doctrine Document 2-2, 2001, Space Operations, Headquarters Air Force Doctrine Centre, Maxwell AFB, Alabama

Australian Air Publication 1000, 2002, Fundamentals of Australian Aerospace Power, Fourth Edition, Aerospace Centre, Canberra

Australian Air Publication 1002, 1999, The Operational Air Doctrine Manual, Headquarters Air Command, Glenbrook

Australian Defence Doctrine Publication, 2002, Foundations of Australian Military Doctrine, Australian Defence Headquarters, Canberra

Bowd, R. 2002, Contemporary Perspectives on National Missile Defence, Australian Defence Force Journal No. 155, Department of Defence, Canberra

Department of Defence, 2000, Defence 2000 – Our Future Defence Force, Defence Publishing Service, Canberra

Department of Defence, 2002, Future Warfighting Concept, National Capital Printing, Canberra

Department of Foreign Affairs and Trade, 1997, In the National Interest, Commonwealth of Australia, Canberra

Dutton, L. de Garis, D. Winterton, R. Harding, R. 1990, Military Space, Brassey's

Grundhauser, L. 1998, Sentinels Rising – Commercial High Resolution Satellite Imagery and its Implications for US National Security, Aerospace Power Journal, Winter 98

Haller, L. & Sakazaki, M. 2001, Commercial Space and United States National Security, United States Air Force Institute for National Security Studies Web site, http://www.usafa.af.mil/inss/

Houston, A. 1999, Keys to Space – An interdisciplinary approach to space studies, McGraw Hill

Jumper, J. 2002, A word from the Chief, Air and Space Power Journal, Fall 2002, Maxwell AFB, Alabama

Khalilzad, Z. Shapiro, J. (eds), 2002, Strategic Appraisal: United States Air and Space Power in the 21st Century, Rand Corporation, Washington

Lee, J. 1993, Counterspace Operations for Information Dominance, Air University, Maxwell AFB

Nicholson, P. 2000, Aerospace Power: The Military Use of Space, Aerospace Centre, RAAF Base Fairbairn

Oberg, J. 1999, Space Power Theory, United States Space Command, Colorado Springs

Preston, B. 1994, Plowshares and Power – The Military Use of Civil Space, National Defence University Press

Preston, B. Johnson, D. Edwards, S. Miller, M. Shipbaugh, C. 2002, Space Weapons, Earth Wars, Rand Corporation, Washington

Sach, R. 2002, Defence Space Guidance – 2002 (Draft), Defence Space Directorate, Canberra

Steinberg, G. 1998, Dual Use Aspects of Commercial High Resolution Imaging Satellites, Begin-Sadat Centre for Strategic Studies

U.S. Department of State web site, Missile Technology Control Regime, Washington, www.state.gov/t/np/rls/fs/2001/5340.htm , accessed 25 Sep 02

Wallis, S. Fogg, D. 2001, Space Operations: An Australian Perspective, Aerospace Centre, Canberra