

**The “Joint Facilities” revisited –
Desmond Ball, democratic debate
on security, and the human
interest**

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*Introduction: Temper democratic, bias human**

Desmond Ball's labours through four decades to elucidate the character of United States defence and intelligence facilities in Australia, to document the evidence, test the balance of benefits and dangers to both national security and human security, and then tell the story to his fellow Australians is unparalleled in Australian intellectual and political life, and I suspect on an international scale. The dedication, often neglected, to the most famous and influential part of this work, *A Suitable Piece of Real Estate: American Installations in Australia*, was the call "for a sovereign Australia". We might best sum up the character of Ball's work of a lifetime – or more precisely, this one, brightly coloured, thread of a multi-stranded body of work – by recalling the enduring watchwords of an earlier Australian nationalist, Joseph Furphy: "temper democratic, bias Australian".¹ Both elements are keys to understanding the animating force behind Ball's work on the American installations in Australia² – the concern for a fully and properly informed public as a prerequisite to democratic debate about the American bases, and the concern that Australians identify their country's specific interests concerning the bases, citing Malcolm Fraser's prescient but often ignored 1976 warning that the interests of the United States and the interests of Australia are not necessarily identical."³

And yet, this is not enough, on either count. One might more properly say of Ball on the bases that the work is characterized by "Temper offensively democratic, bias human". Ball's anger is clear for those Australian officials and politicians who would hide the true nature of these military and intelligence bases behind unwarranted secrecy, unjustified discounting of risk, and willingness to traduce the fundamental civil rights of citizens in a democracy. At root, Ball was not only sure that truths hidden or obfuscated by government would always be revealed in the end, but he was confident that a properly

* An earlier and abridged version of this paper appears in Brendan Taylor, Nicholas Farelly and Sheryn Lee (eds.), *Insurgent Intellectual: Essays in honour of Professor Desmond Ball*, (ISEAS, 2012). My thanks to the editors for their patience, to Peter Hayes, and to Jeffrey Richelson and Bill Robinson for providing important material for this chapter. My greatest debt is to Desmond Ball for three decades of friendship and teaching. Needless to say, none are responsible for my errors. Email: rtanter@nautilus.org

¹ Ball closed a series of interviews for a National Library of Australia Oral History in 1994 by saying: "I'm very much an Australian. My beliefs as far as they've affected my views of defence policy and foreign policy have been very much as an Australian nationalist, a nationalist from the left wing of the political spectrum. I've been a member of the Labor Party for most of my life, though during the latter part of the Hawke prime ministership I let my membership lapse. The reasons for being a member of the Labor party have got more to do with questions of social justice and basic working class ethos than it does because of the Labor Party's views on defence". National Library of Australia, Recorded Interview with Prof. Desmond Ball, TRC 3146, b. 1947. Interviewer: Stewart Harris. Dates of interview: 26 October 1994, 2 November 1994; p. 68.

² I will address the question of the sometime "joint" US-Australian character of the major bases below, but for the present note that in none of the titles of his works on the bases from 1975 to 1999 does Ball refer to them other than "American".

³ Australia, House of Representatives, *Commonwealth Parliamentary Debates*, 1 June 1976, p. 2738, cited in Jeffrey T. Richelson and Desmond Ball, *The Ties That Bind: Intelligence Cooperation Between the UKUSA Countries - the United Kingdom, the United States of America, Canada, Australia and New Zealand*, (Sydney, London and Boston: George Allen and Unwin, 1985), p. 303. For also Fraser's more recent extended critique: "Politics, Independence and the National Interest: the legacy of power and how to achieve a peaceful Western Pacific", The Whitlam Oration, Sydney, 6 June 2012, in Sydney, 6 June 2012, reprinted in "[The Whitlam Oration given by Malcolm Fraser](#)", *The Age*, 7 June 2012; and Malcolm Fraser, "[Our star spangled manner](#)", *The Age*, 7 June 2012.

informed Australian public would be able to make judicious assessments on the merits of a case that a reasonable government committed to both genuine national security and a viable democratic polity could live with.⁴

Moreover, while retrieving national sovereignty has always been central to Ball's critique of particular American facilities (or particular aspects of some or all of them), from the beginning of his career Ball has often gone beyond questions of national interest to the identify the ways in which the outcome of misconstrued or inadequate conceptions of national interest have implications for the wider human interest – or indeed, a planetary interest – albeit in a distinctively Australian accent.⁵

1. Purpose and method

Tellingly, Ball's published work on the American bases begins in 1975 with a 14 page article titled "American bases in Australia: the strategic implications" in the venerable Australian adult education magazine the *Current Affairs Bulletin*.⁶ Over the next decade and a half Ball published two major works, four monographs and a series of research and policy papers documenting, analysing, and assessing the implications of these American installations. Of these, Ball's 1980 book *A Suitable Piece of Real Estate: American Installations in Australia* became the best known of all of Ball's dozens of books. The book has an iconic status for many Australians, in part because it is often assumed to be principally about the Joint Defence Facility Pine Gap.

In fact only 24 pages of *A Suitable Piece of Real Estate* are devoted specifically to that base, but the apparent error of fact is a slip of the mind that reflects the profound significance Pine Gap has acquired in Australian culture, as well as in practical political life, in both cases largely due to Ball's work. Amongst all the many American (and Australian) military installations past and present in Australia, Pine Gap occupies a literally iconic place in the Australian imaginary. Through Ball's work, magnified by the repressiveness of excessive and inept government secrecy, the base has acquired a sense of specialness – a place of difference, and a place of manifold potency, not least politically.⁷ In the minds of many Australians, American concern about a threat to the future of Pine Gap was enough to bring down the elected government in 1975. Its association with uncontrollable foreign powers, extraordinarily sophisticated technology, the exotic and necessarily fantasy-laden realm of space, and its associations with the use of nuclear weapons and as well as being a target of them all contributed to a mystique that the only vaguely serious Australian government statement about its purpose more prosaically described as "unwarranted" - somewhat optimistically since the statement had little effect. Physically located just a

⁴ Referring to the limitations and obfuscations in the 1988 statement to parliament by prime minister Bob Hawke on the rationale for the major "joint facilities" Ball concluded his Pine Gap by saying "The irony is that if the 'unwarranted mystique' surrounding Pine Gap was removed, the Australian public would overwhelmingly endorse the continued maintenance of the station." Desmond Ball, *Pine Gap: Australia and the US Geostationary Signals Intelligence Satellite Program*, Sydney: Allen and Unwin Australia, 1988, p. 95.

⁵ See, for example, Desmond Ball, *The Probabilities of "On the Beach": Assessing "Armageddon Scenarios" in the 21st Century*. Working Paper No. 401, Strategic and Defence Studies Centre, Australian National University, Canberra, May 2006.

⁶ "American Bases in Australia: The Strategic Implications", *Current Affairs Bulletin*, Vol. 51, No. 10, March 1975, pp. 4-17.

⁷ To Ball's chagrin, these qualities – and more – are sensed by large numbers of UFO enthusiasts who importune him with requests for the still hidden truths of the facility.

short way from Alice Springs, a town that most Australians never visit, Pine Gap vies with Uluru for primacy as the symbolic centre of the country. The physiognomy of the base, with its faceless white domes jumping out of the browns and greens of the McDonnell Ranges behind it, quietly captured in an often reproduced still from Gill Scrine's 1981 documentary film *Home On The Range* contributes much to this sense of mystery and potency, and its ongoing capacity to act as a container of powerful projections of promise and threat.⁸

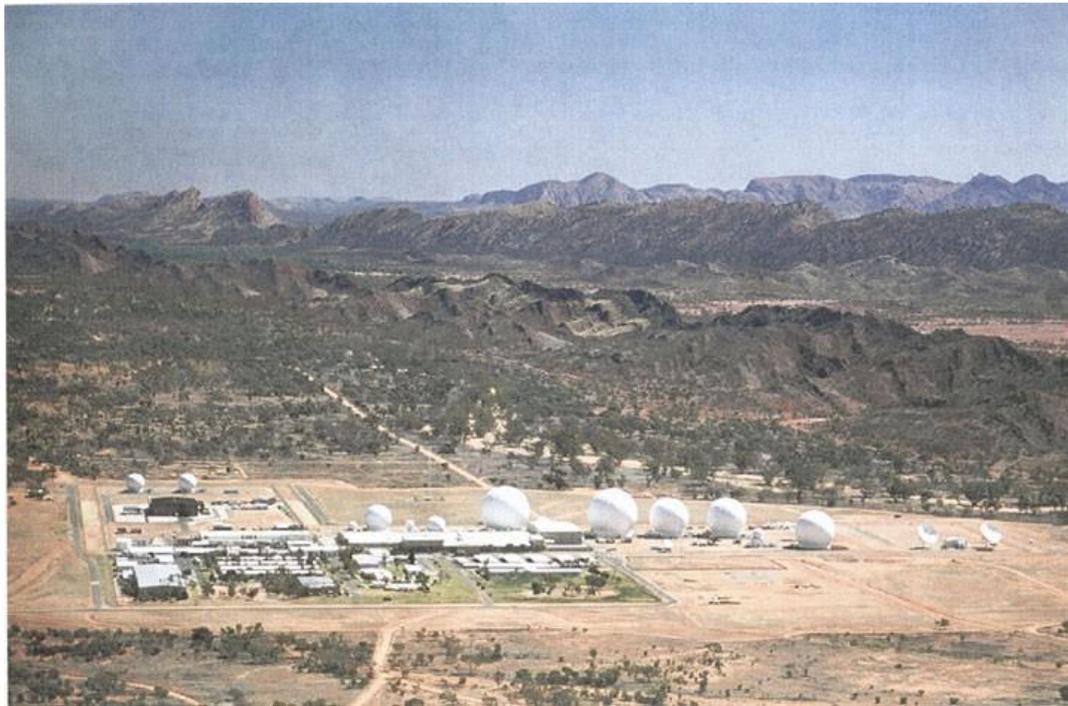


Figure 1: Joint Defence Facility Pine Gap
Source: [Federation of American Scientists](#)

For many Australians of a certain generation, *A Suitable Piece of Real Estate: American Installations in Australia* was profoundly shocking. Never before had any researcher provided a list of even half of the “more than twenty” US military, intelligence, scientific and space facilities in Australia that Ball documented.⁹ Never before had the major bases been documented in such detail. Never before had the nature and activities at these facilities been documented primarily from mainstream United States military, congressional, technical and corporate sources, leaving no doubt about the credibility of Ball’s claims about their strategic implications. Never before had a writer – and in particular one from the country’s premier research university – so comprehensively, systematically and elegantly spelled out a framework for the assessment of the advantages and risks associated with each of these facilities within a framework that drew on strategic studies, defence policy, and democratic understandings of the national interest. And, once the misleading, artful, and incompetent official Australian government

⁸ *Home on the Range* a Gil Scrine Film, (54 mins), [Antidote Films](#)

⁹ “The precise number is difficult to determine – there are problems of official obfuscation and of technical definition – but it is more than twenty.” Ball, *A Suitable Piece of Real Estate, op.cit.*, p. 19. See the discussion of the official list provided in Parliament in 1978, and its many omissions, in the “Appendix: The two faces of officialdom” to *A Suitable Piece of Real Estate*.

explanations and justifications for the bases were exposed and found laughably wanting, never again did Australian public consciousness of the bases' double-edged and complex blending of benefit, violation and dread ever completely evaporate.

A Suitable Piece of Real Estate opened with the central thrust of Ball's work on the bases over four decades:

“American installations in Australia have always been the subjects of continued lack of candour on the part of the United States and of extraordinary secrecy, evasion and deception on the part of Australian governments.”¹⁰

The book intended to deal with the problems of

“exactly what American defence, scientific, communications and intelligence installations there are in Australia, and of establishing which of these have functions and missions of any strategic significance”.¹¹

Seven years later, in the more closely argued *A Base for Debate: The US Satellite Station at Nurrungar*, Ball exemplified his argument on the need to understand the precise nature and function of each particular facility in order to assess its desirability strategically and politically. Ball prefaced his study of the Australian ground station for the US Defense Support Program satellites by setting out a precise list of differences between the three major American bases of the day: Nurrungar, the US naval communications station at North West Cape, and the Pine Gap signals intelligence ground station. These differences, Ball wrote, “are in terms of

- (i) their respective functions and missions;
- (ii) the nature of their relationships to the US strategic nuclear posture and their role in US deterrence and war-fighting postures;
- (iii) their implications for the global strategic balance;
- (iv) their role (if any) in the promotion of arms control;
- (v) the consequences to surrounding areas of nuclear attacks on them; and
- (vi) the extent to which their location in Australia is simply a matter of convenience.”¹²

Examination of these dimensions of American facilities then enabled Ball to make grounded strategic and political assessments of each of the major bases – rejecting North West Cape as “simply incompatible with Australian sovereignty”¹³; recommending either prompt closure of Nurrungar or maintenance for a limited time subject to stringent (and politically improbable) conditions on its nuclear war-fighting role; and finding, regarding Pine Gap, that despite its essentially American character and purpose, its role in nuclear war-fighting plans, and its status as a likely nuclear target, on balance “it is simply not possible to seriously support arms control and disarmament and at the same time argue for the closure of the Pine Gap station”.¹⁴

¹⁰ Ball, *A Suitable Piece of Real Estate*, *op cit.*, p. 19.

¹¹ *Ibid.*, p. 19

¹² Desmond Ball, *A Base for Debate: The US Satellite Station at Nurrungar*, (Allen and Unwin, Sydney, London and Boston, 1987), p. xii.

¹³ *Ibid.*, p. 86.

¹⁴ Ball, *Pine Gap*, *op.cit.*, p. 94.

We will return to these issues below, in the context of claims for the “joint” Australian-American status for the remaining and new bases, major systemic expansions of the roles and functions of Pine Gap and North West Cape, and a dramatic heightening of integration of Australian and US intelligence and military forces and systems that require a reinterpretation of issues of sovereignty.

Speaking of the motivation for *A Suitable Piece of Real Estate*, Ball set out two of the fundamental assumptions behind all of the work on the American bases, namely

“a strong personal conviction that an understanding of the physical characteristics and technical functions of the installations, what they are and what they do, is essential to any strategic or political analysis. It is not possible to assess the consequences of the installations for Australia’s national security, let alone discuss political questions such as the efficacy of Australia’s democratic institutions in the national security area, without such an understanding.”¹⁵

This stress in Ball’s work on an understanding of the technical and physical characteristics of defence and intelligence facilities as a prerequisite to comprehending their strategic and policy significance in democratic polities has often led to two unwarranted conclusions.

The first – usually whispered, and sometimes with a touch of envy – is a criticism of Ball’s intelligence studies as “merely technical” or “empiricist”, implying an inappropriate attention to matters outside the domain of more important questions of strategy and politics. In fact, Ball’s analysis of the technical functions and physical characteristics of particular facilities provided him with the solid ground from which to make keen and subtle distinctions as to the relative balance of benefits and risks in each case – most famously in the case of Pine Gap, which is, as he explained with some anguish in 1999:

“the one which I have had to force myself to come out and support... simply because I regard the intelligence which is collected there as critically important and collectable in no other way.”¹⁶

The second conclusion sometimes drawn from this link between technical understanding and capacity to assess strategic and democratic policy implications is not so much a criticism as a muttered excuse for avoidance of the research field. This is the belief that Ball’s achievement is too difficult to match – the sense that the technical issues are so complex for those not technically trained and the materials so difficult to obtain for people outside a certain charmed circle of “respectable” insiders that the ordinary researcher in academia or civil society can neither continue the work in its contemporary setting, nor critically assess Ball’s work from a comparable foundation.

Lack of information is certainly not true: Australian and foreign media have reported many developments related to the bases prominently, if not in depth. A great deal of informative and detailed background material is readily found by anyone who looks –

¹⁵ Ball, *A Suitable Piece of Real Estate*, *op.cit.*, p. 19.

¹⁶ [Testimony of Professor Desmond Ball to the Joint Standing Committee On Treaties, Reference: Pine Gap](#), Official Committee Hansard, Parliament of the Commonwealth of Australia, 9 August 1999, p. 3.

especially in government and industry circles in the United States.¹⁷ In fact the problem is often a matter of being swamped by data and analysis. Understanding the broad technical characteristics of particular systems may not be easy, but neither is it overwhelmingly difficult with the more time and application researchers devote to other matters.

Given the actual possibilities of emulating, extending, and critiquing Ball's work, and the research facilities and time available to Australian university-based researchers, more powerful explanations are needed to explain this comparative silence. These include academic researchers' belief in risks – imagined or real - of damage to career prospects of inquiring too closely into certain questions, lack of interest in or aversion to “technology matters”, and amongst those employed in fields of politics, international relations and social inquiry, preoccupation with downstream theoretical questions and distaste for unfashionable technically and historically grounded empirical work.

2. Foundations

However, in two respects, Ball's work on the American bases rests on foundations which, if not unique, are certainly not common. Speaking to members of a parliamentary committee frustrated with the refusal of the Department of Defence to provide any substantial explanation of the role of Pine Gap, Ball hinted at one foundation of his own work:

“It really depends on the relationship which this committee has with people in the Department of Defence, the personal levels of connections which have been built up and the trust in the end which exists between members of this committee and the Department of Defence as to the extent to which they might be a little bit more forthcoming with you.”¹⁸

Ball's work on other matters has brought him into close contact with defence and intelligence officials in Australia and the United States over four decades. While often officially close to *persona non grata* to Australian senior officials at particular times, equally Ball has held the respect of other senior officials and political leaders, and is clearly trusted as an informed but discreet dialogue partner by at least some of those in a position to know. Trust built slowly over many years brings a certain level of access impossible for almost anyone else outside authorised circles. At the Strategic and Defence Studies Centre, former Defence Department officials such as Paul Dibb and Ron Huisken, while careful to observe the severe limitations on what they could say flowing from their security commitments in their previous careers, played an important part in Ball's thinking at certain times.

One striking product of those relationships was the detailed testimony that Ball and Dibb gave to the Joint Standing Committee on Treaties in August 1999 on the subject of Pine Gap. Ball spoke first in a prepared statement followed by question and answer, for 18 pages of transcript. Dibb followed, making clear the limitations on what he could tell the Committee. The sequencing was intentional and significant, with Dibb listening to Ball's presentation. Not only did Dibb not dissent from any of Ball's analysis, but he went on

¹⁷ Recall that all of the works about the bases under discussion were written prior to the internet era.

¹⁸ [*Testimony of Professor Desmond Ball, op.cit.*](#), p. 14.

to give it his overt, if partial, imprimatur: “Professor Ball can go somewhat further than I can. He and I would have significant areas of agreement.”¹⁹

Ball acknowledged the fine line the maintenance of this trust required him to walk:

“One draws the line with regard to the technical operational secrets of how this intercept technology parked up in space actually works, and how some of the more sensitive intelligence collected through that technology works, but we do not talk about that. If you look carefully at my various writings, you will see where I draw the line and simply will not go any further, regardless of whether I know about it or not.”²⁰

That fine line was invisible to government critics of Ball’s work on the bases in the United States and in Australia. The *1988 History of Air Force Space Command* reported that

“37 percent of [poll] respondents opposed joint US-Australian defense bases on the continent. This was followed by the March appearance of Pine Gap, yet another study of the US-Australian space-related installations in the country authored by perennial critic Desmond Ball.”

Together with demonstrations and the opposition of the Australian government to the US Strategic Defense Initiative, public opinion and Ball’s publications had led to a situation where

“the issue of additions or alterations to the equipment deployed at the OGS [Overseas Ground Station, Nurrungar] was fraught with complications... Any of these initiatives might be threatened by an outburst of public suspicion or animosity aimed at the jointly operated bases... [T]he need for caution in pursuing the [matter] dictated that the host country officials move in a deliberative manner.”²¹

Yet despite such perennial official criticism, Ball established and maintained good relations with many senior US military leaders, Defense Department officials, politicians (including Jimmy Carter), and leading researchers at institutions such as the RAND Corporation where Ball worked on a USAF-related project on Soviet signals intelligence.

¹⁹ *Testimony of Professor Paul Dibb to the Joint Standing Committee On Treaties, Reference: Pine Gap*, Official Committee Hansard, Parliament of the Commonwealth of Australia, Parliament of the Commonwealth of Australia, 9 August 1999.

²⁰ *Testimony of Professor Desmond Ball, op.cit.*, p. 9. These two parliamentary testimonies are the most sustained concise explication and argument about Pine Gap to date, including Ball’s *Pine Gap* a decade earlier. Ironically, in the Alice Springs trial of four peace activists who broke into Pine Gap in December 2005 to protest its involvement in the wars in Iraq and Afghanistan, “the accused sought to refer to this material, but the Commonwealth objected, invoking the *Parliamentary Privileges Act 1987 (Cth)*, which, they argued, prevented anything said in Parliament (subject to some inapplicable exceptions) from being repeated in a court. To the dismay of the unrepresented accused, who had assumed that Parliament would be regarded by a court as a particularly authoritative source of information, the objection was upheld.” See Russell Goldflam, “Satellites, Citizens And Secrets: R v Law and Others”, *Austral Policy Forum*, Nautilus Institute, 1 September 2008.

²¹ United States Air Force, *History of Air Force Space Command, January-December 1988*, pp. 34-35. In August the previous year a US Air Force *Point Paper on Nurrungar* noted the publication of *A Base for Debate* by “Dr. Desmond Ball, a prominent Australian critic of the joint US/Australian facilities”, who “advocates a public debate on the issue of closing the facility by late 1989”. *GOA Point Paper on Nurrungar*, Staff Summary Sheet, 24 August 1987. I am grateful to Jeffrey Richelson for providing these documents.

This was a source deep concern to senior Australian Defence Department officials, including its secretary, Sir Arthur Tange. Dismayed that a radical (and long-haired!) critic of the department could have such a high level security clearance that he could enter any building at the RAND Corporation, the department pressured RAND relentlessly over more than a year to dismiss Ball. Senior RAND officials supported Ball for a long period against demands conveyed through the military and Defense Department, and only relented when Australia raised the matter at an official diplomatic level with the State Department.²²

While the fraternity of writers on US electronic intelligence facilities in Australia and other countries is a small one, Ball's work on the American bases has not been a solitary endeavour. Indeed, much of its success derives from his partnerships and collaborative exchanges with a small group of researchers, journalists, publishers, activists around the world, as well as, *sotto voce*, government officials. The most sustained of the work on the bases, *The Ties That Bind* (1985) on the UKUSA countries' security and intelligence bureaucracies, was a joint effort with the US intelligence researcher Jeffrey Richelson. Richelson's own 1999 *America's Space Sentinels*, a full-length study of the Defense Support Program, built on Ball's Nurrungar study a decade earlier, and their collaboration continues.²³

The pioneering New Zealand peace researcher and activist Owen Wilkes was an early and longstanding collaborator with Ball in research on American bases in Australia and the Pacific, nuclear targeting, and signals intelligence in a number of countries, including Japan. Ball's work on the American bases involved extensive collaboration with the British activist and journalist Duncan Campbell, the New Zealand activist researcher Nicky Hager, the maoist activist Albert Langer, the American military analyst William Arkin, the Canadian signals intelligence specialist Bill Robinson, and the Australian journalists Brian Toohey, Bill Pinwill and George Munster.

Ball has also always been aware of the need to take the results of academic research into the public sphere. Relationships with journalists and publishers, as well as with politicians, are a key part of Ball's working method. In a small country like Australia, book publishing is a tender and sensitive plant. In 1980, Ball began a decade-long collaboration with the entrepreneurial publisher John Iremonger, who brought out *A Suitable Piece of Real Estate* under the Hale and Iremonger imprint. Probably the best selling and best known of Ball's books, *A Suitable Piece of Real Estate* was distinctively and well designed, memorable for its cover photograph, and successfully marketed commercially by Iremonger, finding eager readers in a then burgeoning peace movement animated by apparent Australian enthusiasm for the Reagan administration's ramping up of the Cold War.²⁴ After Iremonger moved to Allen and Unwin, he and Ball went on to publish *The Ties that Bind*, *A Base for Debate*, and *Pine Gap*.

The second unique foundation of Ball's work on the American facilities in Australia in the intense decade and a half from 1975-1990 is the fact that Ball was simultaneously

²² National Library of Australia, *op.cit.*

²³ Richelson and Ball, *op. cit.*; and Jeffrey T. Richelson, *America's Space Sentinels: DSP Satellites and National Security*, (University Press of Kansas, 1999).

²⁴ In 1981 I asked Ball to write a short article providing a concise comprehensive account of the American bases for the first of the *Peace Dossier* series published by the Victorian Peace Studies Association. Over the next five years or so VAPS and People for Nuclear Disarmament sold several thousand copies. *American Bases in Australia*, Peace Dossier 1, (Melbourne: Victorian Association of Peace Studies, 1982).

engaged in three other streams of work: nuclear war-fighting doctrine and planning; cooperation amongst the global intelligence community centred on the UKUSA agreement; and a reorientation of Australian defence towards what came to be called the defence of Australia outlook. Each of these buttressed the American bases work, and provided insights unlikely to spring to mind from more restricted concerns.

2.1 Catastrophic flaws in “the contained argument of the bomb”

In the year Ball published *A Suitable Piece of Real Estate* in Australia, he also published *Politics and Force Levels* in the US, his analysis of bureaucratic political factors in strategic missile decision-making in the Kennedy administration.²⁵ Three years later Ball published the work that many would regard as his most influential strategic policy work – certainly the most significant for the global human interest – the densely argued 38 page inquiry on the question “*Can Nuclear War Be Controlled?*”²⁶ Ball’s answer, coming at a time of confident American policy discussion of controlled and graduated nuclear escalation, was that, amongst other clearly significant factors, the “enormous” vulnerability of even hardened command and control systems (and accompanying communications links) is such that control of nuclear forces is likely to be lost early in even a limited nuclear exchange.²⁷ With such a loss of control, an uncontrolled paroxysm of all-out attack was a likely outcome. The vulnerability of facilities such as North West Cape, Pine Gap, and Nurrungar was not only a matter of great danger to Australia²⁸, but also pointed to an endemic and fearful weakness in current US and Soviet planning for nuclear warfighting in the guise of the latest phase of “stable deterrence”. At a policy level, Ball concluded,

“Rather than devoting further resources to pursuing the chimera of controlled nuclear war, relatively more attention might be accorded to another means of satisfying the objectives that limited nuclear options are intended to meet. This is likely, in practice, to mean greater attention to the conditions of conventional deterrence.”²⁹

This careful, deeply informed technical work on one key aspect of what Judith Wright once called “the contained argument of the bomb”³⁰ provided Ball with both the technical sources to understand the Australian situation more clearly than anyone else at the time, and a deep motivation to contribute to informed national debate on the question. Likewise the publication of *Can Nuclear War Be Controlled?* was intended mobilize opinion amongst salient security practitioner elites and a wider public in the face of US government unwillingness to face the danger of its own plans.

²⁵ Desmond Ball, *Politics and Force Levels: The Strategic Missile Program of the Kennedy Administration*, (University of California Press, Berkeley, 1980).

²⁶ Desmond Ball, *Can Nuclear War be Controlled?*, Adelphi Paper No. 169, (London: The International Institute for Strategic Studies, Autumn 1981).

²⁷ The vulnerability of C3 systems is discussed at pp. 9-26. US facilities identified as likely targets include, amongst others, Pine Gap, North West Cape and Nurrungar.

²⁸ Desmond Ball, “Limiting damage from Nuclear Attack”, in Desmond Ball and J.O.Langtry (eds.). *Civil Defence and Australia’s Security in the Nuclear Age*. (Sydney: George Allen and Unwin, 1983), pp. 143-181.

²⁹ Ball, *Can Nuclear War be Controlled?*, *op.cit.*, p. 38.

³⁰ Judith Wright, “The precipice” in her *The Two Fires*, (Sydney: Angus and Robertson, 1955).

2.2 *The transnational UKUSA intelligence and security community*

The close focus of *A Suitable of Real Estate* on documenting the large number of American installations in Australia in the late 1970s was matched five years later with Ball's collaborative work with Richelson on the transnational community of intelligence and security agencies of the five Anglophone countries that are party to the UKUSA agreement and its successors.³¹ In certain respects, *The Ties That Bind* is the crucial work, stressing the size, scope, complexity and potency of the American-dominated UKUSA security and intelligence network. That network is "a truly multinational community", able to shroud itself in secrecy and "the mantle of national security to an extent unmatched by even the national defence establishments." More than the other works, *The Ties That Bind* brings the cross-national and multinational context of the American facilities in Australia into focus. Richelson and Ball raised still salient questions about the concordance of the operations and priorities of the UKUSA network as a whole with the needs and interests of the smaller partners such as Australia. Looking further, the work points to questions about the adequacy of national democratic structures to oversee and control each national element of the network – a persistent theme amplifying Ball's concern for Australia sovereignty. Yet implicitly, Richelson and Ball's analysis makes clear the need to go beyond questions of national sovereignty, important as it is in maintaining democratic polities at a national level, to the need to establish cross-national processes of democratic control – a missing element of democratic global governance relevant to multinational institutions of truly global reach and deep penetration into the political cultures of national democratic polities.

2.3 *Towards a self-reliant Australian defence*

At the same time, back in Australia, Ball was engaged in collaborative work with J.O.Langtry on a new framework for the defence of Australia³², and in particular, one that was intended to meet deficiencies in existing planning for existing threats, and at the same time,

"it was very much concerned to ensure that we could design and develop a defence structure, which meant that we didn't have to get involved in other people's conflicts, we didn't have to ... never again another Vietnam."³³

At the same time as Ball was most closely engaged with US facilities, he and Langtry were "working very closely co-authoring a couple of dozen books and monographs and major articles on Australian defence"³⁴, essentially laying the groundwork for and foreshadowing the great shift in Australian defence policy identified with Kim Beazley's time as Defence Minister and the Dibb Report.

One stream of this work dealt with civil defence, which clearly was salient to the possibility of nuclear attacks on Pine Gap, Nurrungar and North West Cape. This work concluded, *inter alia*, while attacks on these facilities would be very likely in the event of

³¹ Richelson and Ball, *The Ties That Bind*, op.cit. See also Jeffrey T. Richelson, *The US Intelligence Community* (Sixth edition) (Westview, 2011), pp. 292-296; and similar in other editions. [UKUSA Agreement Release 1940-1956](#), National Security Agency, 24 June 2010.

³² J.O. Langtry and Desmond Ball, *Controlling Australia's Threat Environment: A Methodology for Planning Australian Defence Force Development*. Canberra : Strategic and Defence Studies Centre, ANU, 1979.

³³ National Library of Australia, op.cit., p. 41.

³⁴ *Ibid.*, p. 41.

nuclear war, other than those working at the facilities, the number of blast casualties in nearby towns would be “extremely low indeed”, and while fallout casualties could be substantial especially in Alice Springs and Adelaide, depending on the number, type and altitude of detonation, and the prevailing winds.³⁵ More generally, Ball argued for a priority to be assigned to civil defence in general against the more immediate demands for resources for military defence, arguing for an “optimum balance” around a concept of *total defence* as a necessary condition of any effective defence policy:

Civil defence should be regarded, along with military, economic and psychological defences, as an essential element of a posture of ‘total defence’. Without a comprehensive strategic policy involving each of these elements it could prove very difficult and perhaps impossible for Australia to respond effectively to a major threat to its security.”³⁶

It is perhaps this promising and creative aspect of Ball’s work on defence policy that has been most thoroughly ignored in the subsequent decades, as a more purely military approach dominated.

In a key essay in 2000 titled “The Strategic Essence” Ball reached back to the evolution in the 1980s of what became the grand bargain he and others involved in what became the Defence of Australia paradigm lead to acceptance of the presence of the bases and the consequent viability of defence self-reliance. There was an Australian interest in stable deterrence and the existing global nuclear balance, and

“hosting the installations, and accepting the attendant risks and costs, represents Australia’s most meaningful contribution to the alliance, in return for which the United States provides the sophisticated technology necessary for Australian self-reliance in credible defence contingencies.”³⁷

Subsequently, Australian planners have identified ‘the knowledge edge’ (*vis-à-vis* Indonesia in particular) as the ‘highest capability development priority’ for the defence forces, especially to ensure military control of the approaches to Australia (the “air-sea gap”) in the event of conflict. For Ball, the intelligence from joint facilities that Australia receives, and access Australia gets to higher levels of US military equipment (unlike non-UKUSA partners) are, together with “access to the most senior strategic councils in Washington”, the pay-offs for hosting the bases.³⁸

What is striking is the absence in Ball’s calculus of the grand bargain of Australian reliance throughout the period of the bases’ existence until the present on US assurances of extended nuclear deterrence – as either a benefit or a cost in the arguments about either the bases as such or their relationship to the alliance. It may be that he discounted

³⁵ Ball, “Limiting damage from Nuclear Attack”, *op.cit.*, p. 167.

³⁶ Desmond Ball, Preface to Desmond Ball and J.O.Langtry (eds.). *Civil Defence and Australia’s Security in the Nuclear Age*. Sydney: George Allen and Unwin, 1983, p. 13.

³⁷ Desmond Ball, “The strategic essence”, *Australian Journal of International Affairs*, Vol. 55, no. 2 (2001), pp. 238-9.

³⁸ *Ibid*, 246. It is important to note that by this time, Nurrungar had disappeared, and North West Cape was no longer an important US base, leaving only Pine Gap amongst the former major US bases – the only one that Ball had felt compelled to accept.

claims about these assurances because of their lack of credibility – or indeed the lack of such assurances at all.³⁹

3. The “joint facilities” today

It is now more than three decades since Ball began his work on the American bases in Australia.⁴⁰ In that time there have been profound changes in the number, character and role of the many that he catalogued in *A Suitable Piece of Real Estate*. Many of the minor facilities had already disappeared by the end of the 1980s, when only North West Cape, Nurrungar, and Pine Gap remained of the major facilities. Today, Nurrungar has gone after being rendered redundant by technological change, leaving only a Remote Ground Station at Pine Gap to link to the DSP satellite network and its successors.⁴¹ As a result of similar technical change, as well as shifting strategic concerns, North West Cape has gone from being a major and vital US communications base to an Australian-run base with only minor US interest, to once again being not only an important US communications base operated with Australia, but a new and vital element in American space war-fighting capacities. Pine Gap has not only greatly expanded its primary signals intelligence function monitoring missile testing, but has expanded its secondary SIGINT role to include collection of signals intelligence vital for American conventional war-fighting in the wars in Iraq and Afghanistan, and in American-led global counter-terrorism activities.

In the past decade a new set of Australian facilities have been opened to the United States, a shift emblematic of much deeper and broader cooperation between Australian and American military forces, with plans for considerably more to come. Overall there may be fewer military and intelligence facilities in Australia to which the United States has significant access than in the 1970s, but their number has risen again after diminishing in the 1980s-1990s. Those that remain and those that have been added have considerably increased the importance of the Australian connection for the United States, and bring both renewed versions of old concerns, and new ones.

Space does not permit a comprehensive account of the reasons for this renewed US military and intelligence presence in Australia, but a list of the principal drivers would include:

- deeper integration between US and Australian military and intelligence;
- greater stress on ADF interoperability with US forces and an ADF niche role in US global planning and deployments;
- the requirements for exploitation of opportunities provided by the “revolution in military affairs”;
- the shift and proliferation of perceived threats deriving from regional dynamics, the post-9.11 focus on terrorism, and the wars in Iraq and Afghanistan;

³⁹ For discussion see Richard Tanter, “[Just in Case: Extended Nuclear Deterrence in the Defense of Australia](#)”, *Pacific Focus*, Vol. 26, No. 1 (April 2011).

⁴⁰ Further documentation concerning the Bradshaw, Delamere, Kojarena, North West Cape, and Pine Gap facilities can be found at [Australian Defence Facilities](#), *Australian Forces Abroad Briefing Book*, Nautilus Institute (frequently updated). This section draws on a more extended treatment in Richard Tanter. “[After Obama—The New Joint Facilities](#)”. *Arena Magazine*, 117 (May 2012).

⁴¹ The DSP Overseas Ground Station – the Joint Defence Facility Nurrungar closed on 12 October 1999. There is also a Relay Ground Station – Europe at Menwith Hill in Britain.

- the militarisation of space, and the consequent centrality of space assets to United States and even Australian security planning; and
- the Obama administration’s Asia-Pacific pivot strategy to address the strategic implications of the rise of China.

These factors will be evident in a brief review of expanded US access to ADF facilities, and the transformation of existing arrangements.



Figure 2: Map of main “joint facilities” and ADF bases (see Table 2)
(John Waddingham and Richard Tanter)

3.1 The North Australian Range Complex and the Joint Combat Training Centre

The most prominent aspects of the new US presence in Australia followed the announcement in November 2011 of the planned rapid deployment of 2,500 personnel in a Marine Air-Ground Task Force (MAGTF) based in Darwin, and US Air Force fighters and bombers rotating through north Australian airfields. The three main training locations for the MAGTF and the USAF elements will be the Bradshaw Field Training Area (just a little smaller than Cyprus), the Mount Bunde Training Area near Humpty Doo, and the 3,000 sq. km. Delamere Air Weapons Range southwest of Katherine, which together make up the ADF’s North Australian Range Complex (NARC).

Apart from their size and relative freedom of movement, the importance of US access to these ADF training ranges is in their making up a Joint Combat Training Centre (JCTC), with high levels of instrumentation and electronic networking with both other ranges and with US and Australian command and training centres. The Defence Department explained the truly joint and networked character and role of Delamere, Bradshaw and Mount Bundey as newly joint facilities:

“A mature JCTC should not be seen as a test range or even a series of ranges. The JCTC should function as a training system that links training management systems, training areas, simulations, headquarters and units. It is proposed that the JCTC should be linked to the US Pacific Command’s Pacific Warfighting Center and the US Joint Force Command’s Joint National Training Capability as part of the US Global Joint Training Infrastructure.”⁴²

3.2 Communications integration and the Australian Defence Satellite Communications Ground Station

The shared experience of three major wars in two decades, combined with the military, intelligence and policing aspects of “the war on terror” has had a stimulating effect on the integration of Australian military and intelligence forces with US counterparts. A critical part of this has involved integration of communications, as evidenced in developments at the formerly purely Australian Defence Satellite Communications Ground Station (ADSCGS) at Kojarena near Geraldton.⁴³ Kojarena has long been the Australian anchor for the global UKUSA coverage of satellite communications, and in particular for the execution of the Echelon component.⁴⁴

A decade ago Ball observed that the “Revolution in Military Affairs” would have a powerful integrative effect on the US-Australian military and intelligence relationship. It provided, he argued, “a unique opportunity to maintain our knowledge edge”, and would result in “a closer and stronger US-Australia alliance”.⁴⁵ As an example Ball noted that even at that time, connecting the new Australian Submarine Combat Information System to the ADF’s information warfare architecture would require high data rate satellite communications capacity. In particular, Ball predicted that “continually escalating throughput capabilities” would be required for the submarines in support of special forces intelligence and strike missions.⁴⁶

⁴² Department of Defence Submission, Response to Issues Paper, Joint Standing Committee on Foreign Affairs, Defence and Trade Inquiry into Australia’s Defence Relations with the United States, Parliament of Australia. May 2005, p.9.

⁴³ “[Australian Defence Satellite Communications Station, Geraldton](#)”, *Australian Defence Facilities, Australian Forces Abroad Briefing Book*, Nautilus Institute.

⁴⁴ This is not purely an American matter. Ball noted in 1988 that Kojarena’s collaboration with the British GCHQ “signifies the cooperative arrangement through which Australia receives an enormous volume of intelligence from the UK.” Desmond Ball. *Australia’s Secret Space Programs*. Canberra Papers on Strategy and Defence 43, Strategic and Defence Studies Centre, Australian National University, Canberra, (1988), p. 69.

⁴⁵ *The New Submarine Combat Information System and Australia’s Emerging Information Warfare Architecture*, Working Paper No. 359, Strategic and Defence Studies Centre, Australian National University, Canberra, (May 2001). p.13.

⁴⁶ *The New Submarine Combat Information System and Australia’s Emerging Information Warfare Architecture*, Working Paper No. 359, Strategic and Defence Studies Centre, Australian National University, Canberra, (May 2001). p.12.

Both predictions were correct, and these networked warfare-derived issues had three expansionary consequences for Kojarena. The networked warfare developments underway in both the Australian and US military have satellite communications at their core, far in excess of what was available even a decade ago. Quantitative aspects of expansion include the number of users in a network, and the volume and rate of data throughput. Qualitative developments include levels of security, ruggedness, coverage, and interoperability within and between national militaries.

Australian requirements for access to high data rate satellite communications in the Ka (26.5–40 GHz) and X-band (8.0–12.0 GHz) frequencies lead to Australia joining the US as its “flagship” international partner in the Wideband Global SATCOM (WGS) system⁴⁷, allocating almost a billion dollars equivalent to the cost of the of the sixth satellite of the principally US-funded constellation of at least seven (and possibly nine) high capacity global war-fighting communications satellites, and consequently gaining access to the global system.⁴⁸

According the then Defence Minister, Brendan Nelson,

"Access to the WGS constellation will build on the ADF's ability to conduct multiple and simultaneous military operations independently or as part of a coalition force. Secure and reliable satellite communications will be available to deployed forces, operational command and Australian headquarters."⁴⁹

However the US still owns and operates the WGS system as a whole.⁵⁰ The first four WGS satellites launched between 2007 and January 2012, WGS-1, -2, -3 and -4 are in operation at 175° E, 60° E, 12° W, 150° E respectively. Australia's MOU and \$1 bn. are the price of access to the system as a whole, and especially the four of the probable total of ten WGS satellites planned to be in GEO above the ADF's area of operations, including the Middle East.⁵¹ The entire constellation is operated by the USAF 3rd Space

⁴⁷ This system was originally known as the Wideband Gapfiller On the Australian flagship role see [“USAF testimony in the House Armed Services Subcommittee on Strategic Forces Hearing”](#), *Satellite Spotlight*, March 16, 2011.

⁴⁸ The agreement is intended to “cooperatively enhance the WGS System through addition of a sixth satellite and all required activities to provide to each Participant, Assured Access to worldwide SATCOM resources for their national use over the operational life of the constellation, commensurate with each Participant's contribution.” [Memorandum of Understanding between the Department of Defense of the United States of America and the Department of Defence of Australia concerning "joint production, operations, and support of Wideband Global Satellite Communications"](#), dated 14 November 2007, para 2.1.1. In January 2012 the United States announced the formation of “a multilateral partnership in wideband global satellite communication, which is valued at more than \$10 billion” with Canada, Denmark, Luxembourg, the Netherlands, and New Zealand, under which “each partner's unique level of requirement will be accommodated corresponding to each partner's level of contribution”. [“U.S. coalition nations form Wideband Global Satellite partnership”](#), *Air Force News*, 18 January 2012. In the same month a USAF official was reported as saying the five countries were in negotiations with the US to pay for access to the WGS system by pledging finance for a ninth WGS satellite, based on the model of the Australian partnership. Debra Werner, [“U.S. Air Force Expects To Order Another Wideband Global Satellite with Allies' Help”](#), *Space News*, 11 January 2012.

⁴⁹ [“Australia To Join With United States In Defence Global Satellite Communications Capability”](#), *Space War*, 9 October 2007.

⁵⁰ For details of positions and locations see [“The US and Australia: An Old Alliance, Fortified through SATCOM”](#), *Army Space Journal*, Fall 2011, p. 27.

⁵¹ See [NSSDC Master Catalog](#), NASA; and Hector Velasco, [“Analysis of Capacity vs Orbital Spacing for military purpose Ka-band satellites”](#); [“Wideband Global SATCOM”](#), *Backgrounder*, Boeing (September

Operations Squadron at Schriever Air Force Base.⁵² By 2013 sixteen ADF personnel will be positioned in WGS-related positions in US military organizations as Cooperative Project Personnel (CPP).⁵³ The ADSCGS has been expanded with a new ground station to link to the WGS satellites. Tenders for the construction of Satellite Ground Station – West (SGS-W, complementing an SGS-E at HMAS Harman), including earth terminals for X-band (two), Ka-band and Ku-band, were let in late 2008.⁵⁴ In 2011 the Defence Department confirmed that an Interim Anchoring Station – West had been built at Kojarena and “has been set to work and is available for operational use.”⁵⁵

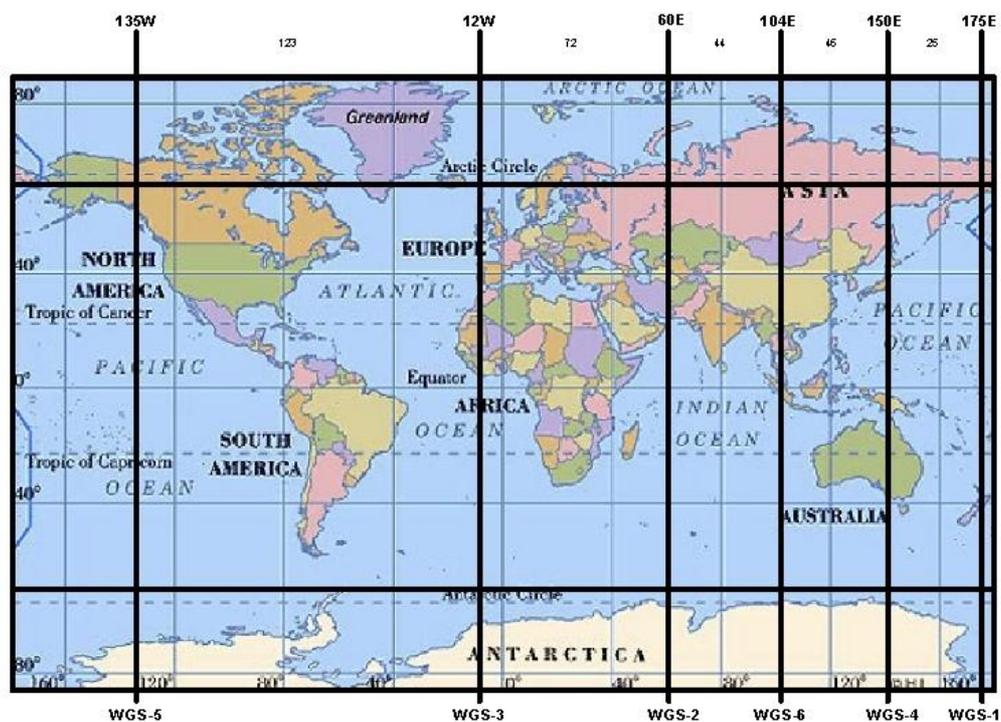


Figure 3: Wideband Global Satellite constellation orbital distribution
Source: Hector Velasco, [Analysis of Capacity vs Orbital Spacing for military purpose Ka-band satellites](#)

In a further physical and functional expansion of the Kojarena station, in November 2007 Australia agreed to the building of an additional but separate facility within the grounds of the ADSCGS. This consists of three small buildings, three 19-metre antennas, and two smaller antennas making up a joint US-Australian ground station for the US Department of Defense Mobile User Objective System (MUOS), a narrow-band networked satellite constellation for UHF satellite communications enabling secure all-

2012). See also Debra Werner, “[U.S. Air Force Expects To Order Another Wideband Global Satellite with Allies’ Help](#)”, *Space News*, 11 January 2012.

⁵² [Factsheet: 3rd Space Operations Squadron](#), Schriever Air Force Base, US Air Force.

⁵³ “[The US and Australia: An Old Alliance, Fortified through SATCOM](#)”, *Army Space Journal*, Fall 2011, pp. 27-28.

⁵⁴ Defence Materiel Organisation, [JP2008 Phase 3F - ADF Satcom Capability Terrestrial Upgrade, Request for Tender 20070223AGSRFT](#), (5 November 2008).

⁵⁵ Next Generation Satcom Capability, JP 2008 Phase 4, Defence Materiel Organisation, [2010–11 Major Projects Report, Brochure](#) (2011), p.15; and Kym Burgmann, “Towards a fully networked force”, *Asia Pacific Defence*, Vol. 37, No. 1, (November 2011), pp. 20-21.

weather and all-terrain 3-G mobile telecommunications, “operating in the most challenging propagation environments”.⁵⁶

The third Kojarena-related development was announced at the 2012 AUSMIN meeting: a Combined Communications Gateway will closely link to the WGS facility and will provide “a dual nation access point to the WGS system.”⁵⁷ In US military parlance, “communications gateway” refers to the hardware, software and organizational interface protocols that enables different communications systems to link effectively – and appropriately given the realities of hierarchical access to information and capabilities.

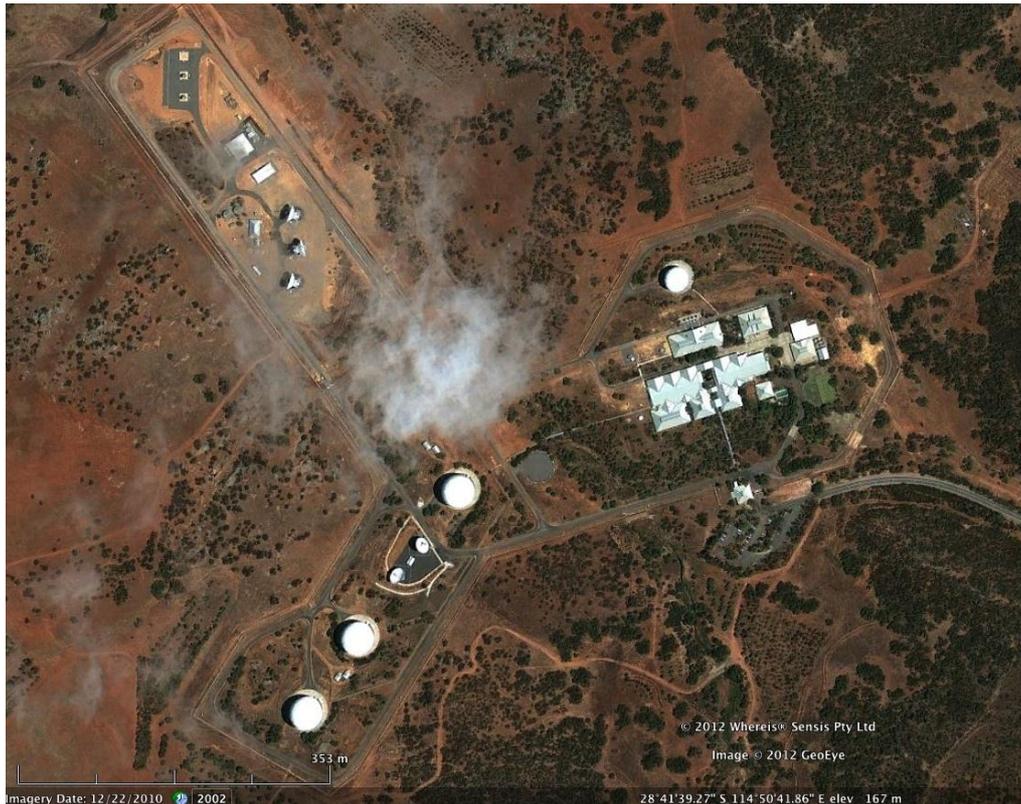


Figure 4: Australian Defence Satellite Communications Ground Station (ADSCGS), Kojarena, Geraldton
Source: Google Earth (22 December 2010)

One aspect of a gateway in such a communication system is to preserve security concerns about access to information amongst a hierarchy of allies, not all of which are trusted with the same levels of access. This has been a growing problem for the United States in matching the technology of networked warfare with its drive for communications interoperability with and between its alliance partners – such as NATO member countries, or, in a more exclusive club, the Five-Eyes or [AUSCANNZUKUS](#) (Australia, Canada, New Zealand, UK, and US) countries. A network of allied combined

⁵⁶ A. Fritz et al. “[Military Satellite Communications: Space-Based Communications for the Global Information Grid](#)”, *Johns Hopkins APL Technical Digest*, 27 (2006): 34-36; Joint Chiefs of Staff. [Joint and National Intelligence Support to Military Operations](#), Joint Publication 2-01, 5 January 2012; and Richard Tanter, “[North by North West Cape: Eyes on China](#)”, *Austral Policy Forum* 10-02A, 14 December 2010.

⁵⁷ Natalie Gerritsen, “[Falling debris: watch this space](#)”, *Australian Financial Review*, 14 November 2012.

organizations such as the Combined Communications Electronics Board ([CCEB](#)) and the American, British, Canadian, Australian and New Zealand Armies' Program ([ABCA](#)) organize the practicalities of the complex interoperability standards and procedures, communications protocols and security hierarchy of alliances with different – and fluctuating - levels of trust.



Figure 5 Australian Defence Satellite Communications Ground Station – northwest area, MUOS/WGS developments
Source: Google Earth (22 December 2010)

3.3 North West Cape: nuclear submarine communication and the militarisation of space

The Naval Communication Station Harold E. Holt at North West Cape, which was originally a US only facility, then a joint station, and with the end of the Cold War, an Australian-controlled facility, has returned to a US war-fighting role with a vengeance, by two distinct pathways.

Naval communications

The first leads from US concern to retain naval dominance in the Indian Ocean, Persian Gulf and Southeast Asia. The original primary purpose of the US Naval Communication Station North West Cape when it opened in 1967 was to enable the US Navy to use powerful Very Low Frequency (VLF) transmissions to communicate with submerged Polaris submarines (and surface vessels) in the Indian Ocean and the western Pacific Ocean. Two important qualities of VLF signals are that they follow the curvature of the earth and hence can be received at great distances, and that they can be detected by receivers more than twenty metres under ocean waters. As the ranges of US submarine-launched ballistic missiles (SLBMs) increased, the *Ohio*-class submarines carrying Trident missiles moved into the depths of the Pacific well away from the Soviet Union, and North West Cape became less useful. By 1992, the United States no longer needed direct

control over the base and full command passed to the Royal Australian Navy. In 1999 Australia took over responsibility for the facility, although US involvement and funding continued.⁵⁸

A decade later the United States was once again concerned to expand the role of North West Cape for regional communication with its nuclear-powered submarines, but this time primarily with attack submarines, and possibly ballistic missile submarines (SSBNs) converted to launch cruise missiles (SSGNs).⁵⁹ North West Cape's return to "joint" status formally began with a 2008 treaty which required Australia to operate a naval communications station, allowing the United States "all necessary rights of access to and use of the station", and split the costs between the two.⁶⁰ The most important aspect of the emphatic US return to the VLF communications base, given that it had always retained access to three of the four communication channels at the facility (with the RAN having the remaining one) was, as the Greens Senator Scott Ludlam put it in a minority parliamentary committee report

"North West Cape continues to facilitate, enable and support nuclear armed submarines, offensive attack weapons platforms, thereby legitimising the retention and deployment of nuclear weapons."⁶¹

Australia and the Space Surveillance Network

If the first twenty-first century movement for the base was a restoration of primarily US strategic naval priorities, the second and quite new pathway, derived from Australia's decision to support the United States' quest for military dominance in space. As a result of the Space Situational Awareness (SSA) Partnership agreement signed in 2010 the US intends to establish a powerful space surveillance sensor in Western Australia, preferably at North West Cape.⁶² This will be part of the US global Space Surveillance Network

⁵⁸ In addition to the VLF station the USN Harold E. Holt station also hosted satellite communications terminals, high frequency (HF) and very high frequency (VHF) radio facilities. The VLF transmitter is located at Area A near the tip of the cape. The HF receivers are located at Area C at the southern end of the peninsula. The other facilities are at Area B, about 10 kms south of the VLF transmitter. Through DMO's Joint Project (JP) 2043 the Australian government upgraded the North West Cape HF facilities as part of a nationwide Modernised High Frequency Communications System (MHFCS) and Defence Wide Area network under the control of Defence Communications Station (DEFCOMMSTA Australia). See [JP 2043 – High Frequency \(HF\) Modernisation Project](#), Defence Materiel Organisation, Department of Defence; and The Auditor-General, [Performance Audit: High Frequency Communication System Modernisation Project, Department of Defence, Defence Materiel Organisation](#), Australian National Audit Office, Audit Report No. 34 2006–07.

⁵⁹ A further role for VLF communications concerns submarines carrying special forces in insertion missions. Note that in 1999 the US Space and Naval Warfare Systems Center awarded a \$35 mn. contract to Continental Electronics Corporation for upgrades "to extend the life of the Very Low Frequency Fixed Submarine Broadcast System sites at Cutler, Maine, Arlington (Jim Creek), Wash., Lualualei, Hawaii, Exmouth, Australia and Aguada, Puerto Rico." [Naval Communications Station Harold E Holt \(NCS HEH\)](#), GlobalSecurity.org.

⁶⁰ [Agreement between the Government of Australia and the Government of the United States Of America relating to the Operation of and Access to an Australian Naval Communication Station at North West Cape in Western Australia](#), (Washington, 16 July 2008). Entry into force: 24 November 2011.

⁶¹ [Dissenting Report – Australian Greens, Report 121 of the Joint Standing Committee on Treaties](#), October 2011. See also the majority report which expressed "some concern" on the same matter: [Report 121 of the Joint Standing Committee on Treaties](#), October 2011.

⁶² Minister for Foreign Affairs Kevin Rudd, Minister for Defence Stephen Smith, Secretary of State Hillary Rodham Clinton, and Secretary of Defense Robert Gates, [Australia-United States Joint Statement on Space](#)

(SSN). The Space Surveillance Network consists of a world-wide network of optical and radar sensors supporting the Joint Space Operations Center (JSpOC).⁶³

The Space Surveillance Network has two principal functions. The first is to provide a global public good through detection and location of the large volume of space debris orbiting the earth and threatening to damage the satellites on which the networked society depends. The primary task of the SSN is to provide JSpOC (soon to be reformed in to Combined Space Operations Center or CSpOC to take account of the role of SSA coalition partner nations⁶⁴) with information on the size, shape, motion, and orientation of objects in space above the earth up to 36,000 kms.⁶⁵ This Space Object Identification (SOI) procedure involves determining the operational status of payloads, predicting de-orbits or manoeuvres, and in the case of unidentified payloads, “mission payload assessment”.

While “space junk” is a genuine and serious problem, the SSN has another important role for the US military, which is to use the same capacities to detect objects in space for offensive and defensive aspects of war-fighting in space. The 2010 AUSMIN *SSA Fact Sheet*, did note that the recipient of the data from radar and optical sensors is the US Joint Space Operations Center (JSpOC), which manages the US Space Surveillance Network at Vandenberg Air Force Base in California. What the Australian government did not say is that JSpOC’s role is to support the mission of the Joint Functional Component Command for Space within US Strategic Command, which “is to provide unity of command and unity of effort in unimpeded delivery of joint space capabilities to supported commanders and, when directed, to deny the benefits of space to adversaries.”⁶⁶

JSpOC itself, self-described as a “synergistic command and control weapon system”, is to provide “continuous C2 [command and control] capabilities to conduct space operations.”⁶⁷ As Space Command’s Space Situational Awareness Sensors Branch (A5CS) put it,

“Intelligence on adversary space activities reveals information on their capabilities and more importantly the adversary’s intent. ... Surveillance of all space objects and space activities is where the Space Surveillance Network contributes the majority of the data. Detailed reconnaissance gives us the visual assessment as to an object’s capabilities and helps us characterize the true intent of that object of interest. ... The most important piece of this puzzle is the integration and fusion of the data to provide a more complete picture of our

Security, AUSMIN 2010, 8 November 2010; and *Space Situational Awareness Partnership Fact Sheet*, AUSMIN 2010.

⁶³ Edward P. Chatters IV and Brian J. Crothers, “[Space Surveillance Network](#)”, in AU-18 Space Primer, Air University Press, September 2009, pp. 249-258.

⁶⁴ C. Robert Kehler, “[Implementing The National Security Space Strategy](#)”, *Milsat Magazine*, Vol. 3, No. 1, April 2012, p. 76.

⁶⁵ [NASA Handbook For Limiting Orbital Debris](#), National Aeronautics and Space Administration, NASA-Handbook 8719.14, Approved: 2008-07-30, p. 45.

⁶⁶ Christopher J. King, Dillard W. Young, Edward P. Byrne, and Paul P. Konyha III, “Space Doctrine”, [AU-18 Space Primer](#), Air University Press, September 2009, p. 65.

⁶⁷ “[Joint Space Operations Center](#)”, Fact Sheet, Vandenberg Air Force Base. 6 June 2008; and King et al, *op.cit.*, p. 66.

space situation, and getting that data to users and decision makers to assess any adverse effects respective to their battlespace."⁶⁸

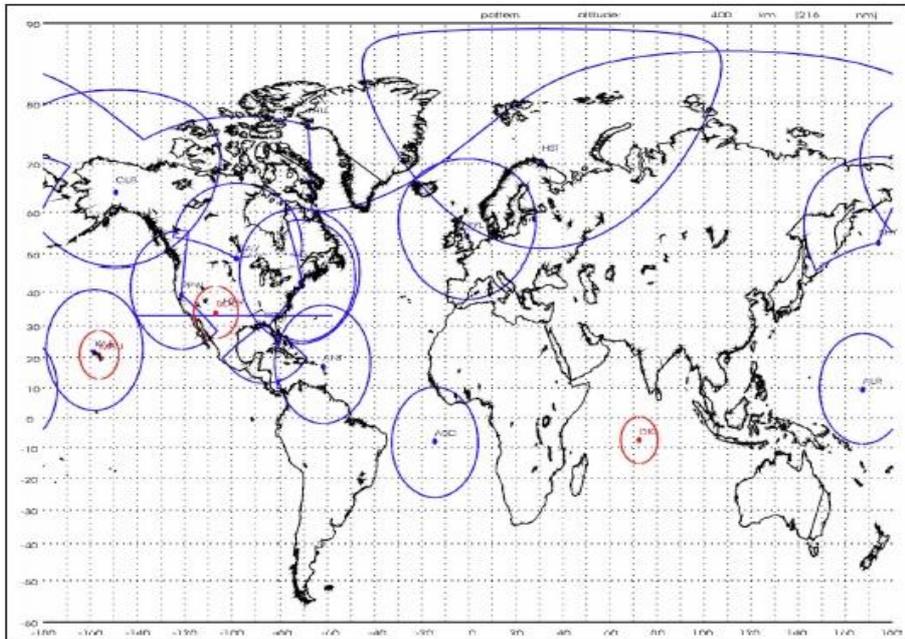


Figure 6 US Space Surveillance Network assets:
Blue: RADAR sensor coverage at 800 km altitude;
Red: electro-optical telescope sensor coverage at 800 km altitude.
Source: Phillip D. Anz-Meador, International Guidelines for the Preservation of Space as a Unique Resource, Appendix B: Space Situational Awareness via Space Surveillance, Embry-Riddle Aeronautical University

By late 2012 it became clear that in fact JSpOC would be receiving inputs from two sets of SSA sensors in Australia, not just one: a space radar at North West Cape, and an electro-optical space surveillance telescope at an Australian location yet to be determined.

Space surveillance radar

In 2010 it appeared that the North West Cape radar sensor would be part of a new United States Space Fence made up of US Air Force-operated S-band (2-4 GHz) phased array radars in Australia, Kwajalein Atoll and Ascension⁶⁹. Construction of the first part of the Space Fence at Kwajalein Atoll in the Pacific is to begin in September 2013, with a

⁶⁸ Hans Thatcher, "[AFSPC A5CS SSA Activities](#)", Advanced Maui Optical and Space Surveillance Technologies (AMOS) Conference, 2011.

⁶⁹ Note that a Defence Department official was reported to have said that the new facility will include both "ground-based radar and optical stations". Angela Pownall, "[US looks to space base in WA](#)", The West Australian July 2, 2011. There are presently Ground-Based Electro-Optical Deep Space Surveillance (GEODSS) System telescopes in the SSN at Diego Garcia, as well as Maui, and Socorro, New Mexico. Edward P. Chatters IV and Brian J. Crothers, "Space Surveillance Network", in *AU-18 Space Primer*, *op.cit.*, p. 250.

plan for operations to begin in 2017.⁷⁰ In 2011 Lockheed Martin and Raytheon began assessing the North West Cape facility after the the Defense Department awarded the two companies contracts for the preliminary design stage.⁷¹

However, in a new agreement was signed the November 2012 AUSMIN consultations as “a demonstration of our commitment to closer space cooperation”, authorizing the transfer of a US space-tracking radar from Antigua in the West Indies to the Harold E. Holt Naval Communication Station.⁷² The C-band (4-8Ghz) mechanical radar was used at Antigua primarily for tracking space US launches from Cape Canaveral. In Australia, under the auspices of the US Joint Space Operations Center, it will be operated jointly to track satellites in low earth orbit (LEO - up to 1,000 kms altitude), missile launches from countries in the region, and, as a global public good, low earth orbit space junk. According to the Australian Defence Department the recycled C-band radar is intended to give the ADF with an opportunity “to grow an SSA capability”.⁷³ Whether or not a phased array radar similar to the one to be deployed to Kwajalein will be deployed to North West Cape, or at Ascension, or both is at least partly dependent on US defence budget issues.⁷⁴



Figure 7: [Antigua – US C-band radar](#),
Source: photo by [marfonseca](#), Panoramio

⁷⁰ [Space Security 2011](#), Project Ploughshares and the Space Security Index; “[Lockheed Martin Space Fence Radar Prototype Tracking Orbiting Objects](#)”, *Press Release, Lockheed Martin*, 8 March 2012; and “USA Moves Ahead with Next-Generation ‘Space Fence’ Tracking”, *Defense Industry Daily*, 25 September 2012.

⁷¹ The naval Air and Missile Defense Radar (AMDR) suite was also being considered in relation to the Space Fence, also involving Raytheon and Lockheed. See [Statement of the Honorable Erin C. Conaton Under Secretary of the Air Force, Department of the Air Force Presentation to the Subcommittee on Strategic Forces Committee on Armed Services, United States House of Representatives. Subject: Fiscal Year 2012 Air Force Space Posture](#), 15 March 2011; and “[AMDR Competition: The USA’s Next Dual-Band Radar](#)”, *Defense Industry Daily*, 16 November 2011.

⁷² [AUSMIN 2012 Joint Communiqué](#), Media Release, Senator the Hon Bob Carr, Australian Minister for Foreign Affairs, 14 November 2012.

⁷³ [JP 3029 Integrated Capability Network Infrastructure, Phase 1 Space Surveillance](#), *Defence Capability Plan 2012 (Public Version)*, Department of Defence, pp, 166-7.

⁷⁴ “[USA Moves Ahead with Next-Generation ‘Space Fence’ Tracking](#)”, *Defense Industry Daily* (updated 14 November 2012); and [Basing of first U.S. Space Fence facility announced](#), U.S. Air Force, (25 September 2012).

Space Surveillance Telescope

Various phased array radars in the Space Surveillance Network are able to detect objects in geo-synchronous orbits (GEO) around 36,000 kms altitude to some extent, but searching in GEO is “[time-consuming and difficult](#)”, while telescopes can do so much more readily.⁷⁵ The Space Surveillance Network includes three clusters of ground-based electro-optical deep space surveillance (GEODSS) telescopes at Diego Garcia, Maui in Hawaii, and Socorro, New Mexico. The GEODSS clusters consist to three electro-optical telescopes with a 1-metre aperture, each with 1.68 degree field of view, and are able to detect objects 10,000 times dimmer than the human eye is able to detect. The smaller Moron Optical Space Surveillance (MOSS) System at Moron Air Base in Spain operates in conjunction with the GEODSS telescopes.⁷⁶ At each site, the telescopes are connected to very low light electro-optical cameras and high-speed computers. The three GEODSS detachments are operated by the USAF Space Command, 21st Space Wing, 21st Operations Group at Peterson Air Force Base, Colorado.⁷⁷



Figure 8: A GEODSS telescope

Source: “[Space Surveillance Sensors: GEODSS \(Ground-based Electro-Optical Deep Space Surveillance\) System](#)” (August 20, 2012), [mostlymissiledefense](#)

⁷⁵ Brian Weeden *et al*, *Global Space Situational Awareness Sensors*, Secure World Foundation, AMOS 2010, p. 8.

⁷⁶ Chatters and Crothers, *op.cit.*, pp. 251-2; and [Unique search and track procedures utilizing the Ground-based Electro-Optical Deep Space Surveillance \(GEODSS\) worldwide sites](#), Eugene Burgio and Ken Grant, BAE Systems, Colorado Springs, Co, DTIC (September 2011).

⁷⁷ Socorro, New Mexico: Detachment 1; Diego Garcia, British Indian Ocean Territory: Detachment 2; and Maui, Hawaii: Detachment 3. *Ibid.*

At AUSMIN 2012 the two countries decided to “work towards” re-deployment of one of a new highly advanced Space Surveillance Telescope (SST) from White Sands Missile Range in New Mexico to Australia. The Defense Advanced Research Projects Agency (DARPA) took over ten years to build this electro-optical scope, which only took its first images in February 2011 and was ready for operation in October 2011, three years behind schedule.⁷⁸ According to Pentagon officials, the SST “will offer an order-of-magnitude improvement over the GEODSS in search rate and the ability to detect and track satellites”.⁷⁹ Also operating under the auspices of the US Joint Space Operations Center, the SST will be “able to search an area in space the size of the United States in seconds” and “is capable of detecting a small laser pointer on top of New York City’s Empire State Building from a distance equal to Miami, Florida.”⁸⁰ The SST will be particularly important for tracking satellites and space debris in geo-synchronous orbits, including micro-satellites.⁸¹ There are now a large number of Chinese military intelligence, communications, and global positioning satellites in geo-synchronous earth orbits (GEO). The Pentagon said ‘the Australians are in the process of selecting a site for the SST.’⁸²

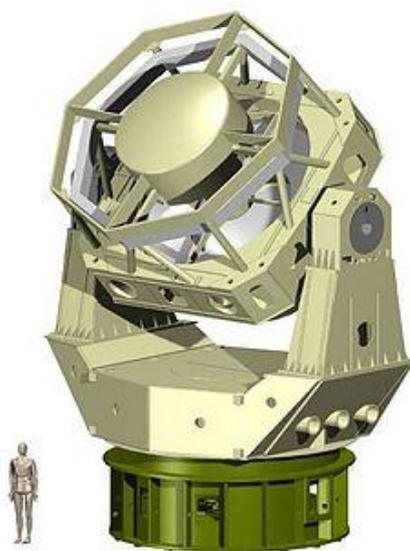


Figure 9: Space Surveillance Telescope schematic
Source: Defense Advanced Research Project Agency

3.4 Pine Gap: the great expansion

The Joint Defence Facility Pine Gap is a part of the US system of “national collection of intelligence by technical means”. This system includes both “national”-level collection platforms, as well as and theatre- and tactical-level platforms. Collection in the system as

⁷⁸ [Space Surveillance Telescope \(SST\)](#), Tactical Technology Office, DARPA; [Space Security Index 2012](#), Cesar Jaramillo (ed.), Space Security.org, p. 47; [Space Acquisitions: Development and Oversight Challenges in Delivering Improved Space Situational Awareness Capabilities](#), Government Accounting Office GAO-11-545 (May 2011), p.14.

⁷⁹ [U.S. to Locate Key Space Systems in Australia](#), *Defense Aerospace.com*, (US Department of Defense media release, 14 November 2012).

⁸⁰ [DARPA telescope headed to Australia to help track space debris](#), *Nanowerk News* (19 November 2012).

⁸¹ For technical details of the SST see [Wide Field-of-View Curved Focal Plane Array](#), Tech Notes, Lincoln Laboratory, Massachusetts Institute of Technology (2012).

⁸² [United States and Australia Advance Space Partnership](#), News Release, Department of Defense, No. 895-12 (14 November 2012).

a whole includes space-based platforms such as the satellites linked to the Pine Gap ground station, and ground-based and air-based platforms.

Pine Gap today is a larger and even more important intelligence facility than it was when Ball last analysed the station in his parliamentary testimony in 1999.⁸³ Pine Gap today houses two distinct sets of facilities. The most important is the control station, downlink centre, and data processing and analysis centre for US signals intelligence collection satellites in geostationary orbits over the eastern hemisphere. That facility consists of a number of satellite antennas, mostly within weather-protective plastic radomes, a Satellite Station Keeping Section tasked with maintaining longitudinal position and satellite physical orientation and system functioning; a large and expanding Signals Processing Station; and a Signals Analysis Station. Signals collected are principally those from missile telemetry, radars, communications satellite uplinks, and terrestrial microwave transmissions in the very high frequency (VHF), ultra high frequency (UHF), and extremely high frequency (EHF) bands. Other ground stations supporting the ADVANCED ORION (sometimes also referred to as MENTOR⁸⁴) program are at Buckley Air Force Base in Colorado, and Menwith Hill in Britain.

The smaller facility is a Remote Ground Station which automatically passes on commands and satellite house-keeping communications to Defense Support Program (DSP) and Space Based Infra-Red Satellite System (SBIRS) satellites in geo-stationary orbit with a capacity to detect infrared radiation signatures emitted by missile launches and missile launches and boost phase trajectories, aircraft after-burners, large scale ground explosions, missile and bombing strikes, aircraft crash explosions and fires on the earth's surface, meteor and asteroid atmospheric entry.⁸⁵ The main control station for the DSP/SBIRS system is also at Buckley in Colorado.⁸⁶

The current constellation of geosynchronous SIGINT satellites are known by code names ADVANCED ORION/MENTOR), of which five have been launched since 1995. Their size is unclear, but MENTOR 3 launched as NROL-19 in 2003 was estimated at a mass of 5,200 kg. In November 2010 MENTOR-5 was launched as NROL-32, and described by the head of the NRO as "the largest satellite in the world".⁸⁷ It is believed that three ADVANCED ORION/MENTOR satellites operate at any one time, with others either retired or parked in reserve orbits in case of failure. Pine Gap is believed to be the downlink for two parked over the Indian Ocean and either Southeast Asia or the western Pacific, and one over the Middle East is downlinked to Menwith Hill.

Pine Gap has gone through a remarkable expansion and transformation in the past two decades. This is externally evident in the number of satellite ground terminals. In 1994

⁸³ For further documentation on this discussion of the Pine Gap facility see Richard Tanter, [Joint Australia-US Joint Defence Facility Pine Gap](#), *Australian Defence Facilities, Australian Forces Abroad Briefing Book*.

⁸⁴ There is some doubt about what the codename MENTOR actually refers to and whether it is identical to ADVANCED ORION. Several analysts identified NROL-15 as a signals intelligence satellite launched into geosynchronous orbit, and as an ADVANCED ORION or MENTOR satellite. For example, see William Graham, "[Delta IV Heavy launches with NROL-32](#)", NASA Spaceflight.com, 21 November 2010.

⁸⁵ U.S. Air Force Fact Sheet, [Defense Support Program \(DSP\) Satellites](#), Los Angeles Air Force Base, 23 February 2011.

⁸⁶ Richelson, *America's Space Sentinels*, op.cit., pp. 224-5.

⁸⁷ General Bruce Carlson USAF (Ret). "[National Reconnaissance Office Update](#)", National Reconnaissance Office. (13 September 2010), p. 7.

there were 13 antennas, 10 with radomes.⁸⁸ As of 1999 Ball had sighted about 18 antennas (some are small and hard to see either from above or at a distance on the ground). In 2002 there were 26 antenna structures, 14 of them with radome environmental covers.⁸⁹ As of mid-2012, Pine Gap has 34 satellite antennas, 20 in radomes and 14 without.⁹⁰

The Central Intelligence Agency has been replaced as the US auspicing authority by the National Reconnaissance Office (NRO). The CIA retains a presence at the facility as an intelligence collection component, but shares that role with components from the National Security Agency (NSA) including Special Collection Elements from all branches of the US military.⁹¹

Table 1. Special Collection Elements resident at Pine Gap

<i>Service</i>	<i>Branch</i>	<i>Unit</i>
US Navy	Navy Information Operations Command	U.S. Naval Detachment Combined Support Group
US Air Force	Air Intelligence Agency	Detachment 2, 544th Information Operations Group
US Army	704th Military Intelligence Brigade	Remote Detachment, Alice Springs, 743rd Military Intelligence Battalion
US Marines	Marine Cryptologic Support Command	Sub-Unit 1, Alice Springs, Marine Cryptologic Support Battalion

This changing personnel structure not only reflects changes in the wider organization of the US intelligence community, but also a proliferation of signals intelligence targets. The primary Pine Gap missile telemetry mission has broadened beyond the original targets of the Soviet Union and China to include North Korea, India, and Pakistan, as well as (possibly sharing responsibility with Menwith Hill) Iran and other Middle Eastern countries. The categories of missiles whose telemetry is tracked has also broadened to include shorter range missiles, and hence requiring a still wider country coverage. It is also likely that launches by US allied countries such as Japan and South Korea would be on the task list, particularly given South Korea's interest in production of longer range missiles. Similarly, the number of countries whose radar emissions would be intercepted, and their locations and characteristics analysed. Microwave links have in most civilian sectors been replaced by optical fibre cable which cannot be intercepted from space, but there are still some telephony and computer systems linked for part of their journey by

⁸⁸ *Question on Notice: Defence: the Pine Gap Facility, (Question No. 1625)*, Commonwealth Parliamentary Debates, Hansard, Senate, 19 September 1994.

⁸⁹ *Defence: Pine Gap (Question No. 286)*, Answers to Questions on Notice, Commonwealth Parliamentary Debates, Hansard, House of Representatives, 28 May 2002, pp. 2555-6.

⁹⁰ *Satellite antennas/radomes at Pine Gap, 1967-2011*, Table produced by Desmond Ball and Bill Robinson, 2007; updated by Bill Robinson and Richard Tanter, 2012, reprinted here as Attachment 1 below.

⁹¹ David Rosenberg. *Inside Pine Gap: The Spy Who Came In From the Desert*. (Pahran, Vic.: Hardie Books, 2011). In early 1998, an Alice Springs detachment of the US Naval Security Group Command was established, made up of 43 officers and enlisted personnel working as "cryptologic officers and technicians". The name of the Naval Security Group Command was subsequently changed to US Naval Information Operations Command [IOC], and in 2012 two IOC units were listed at Alice Springs: the U.S. Naval Information Operations Detachment Alice Springs, and the U.S. Naval Detachment Combined Support Group. Cameron Stewart. "Top US spy unit sent to Pine Gap", *The Australian*, 27 January 2001.

microwave, and there are many important military microwave links of many countries and of a range of types that are lucrative interception targets. Uplinks to communications satellites, military and civilian, provide a rich harvest of different types of communications for the SIGINT satellites, and is one determinant of their location.

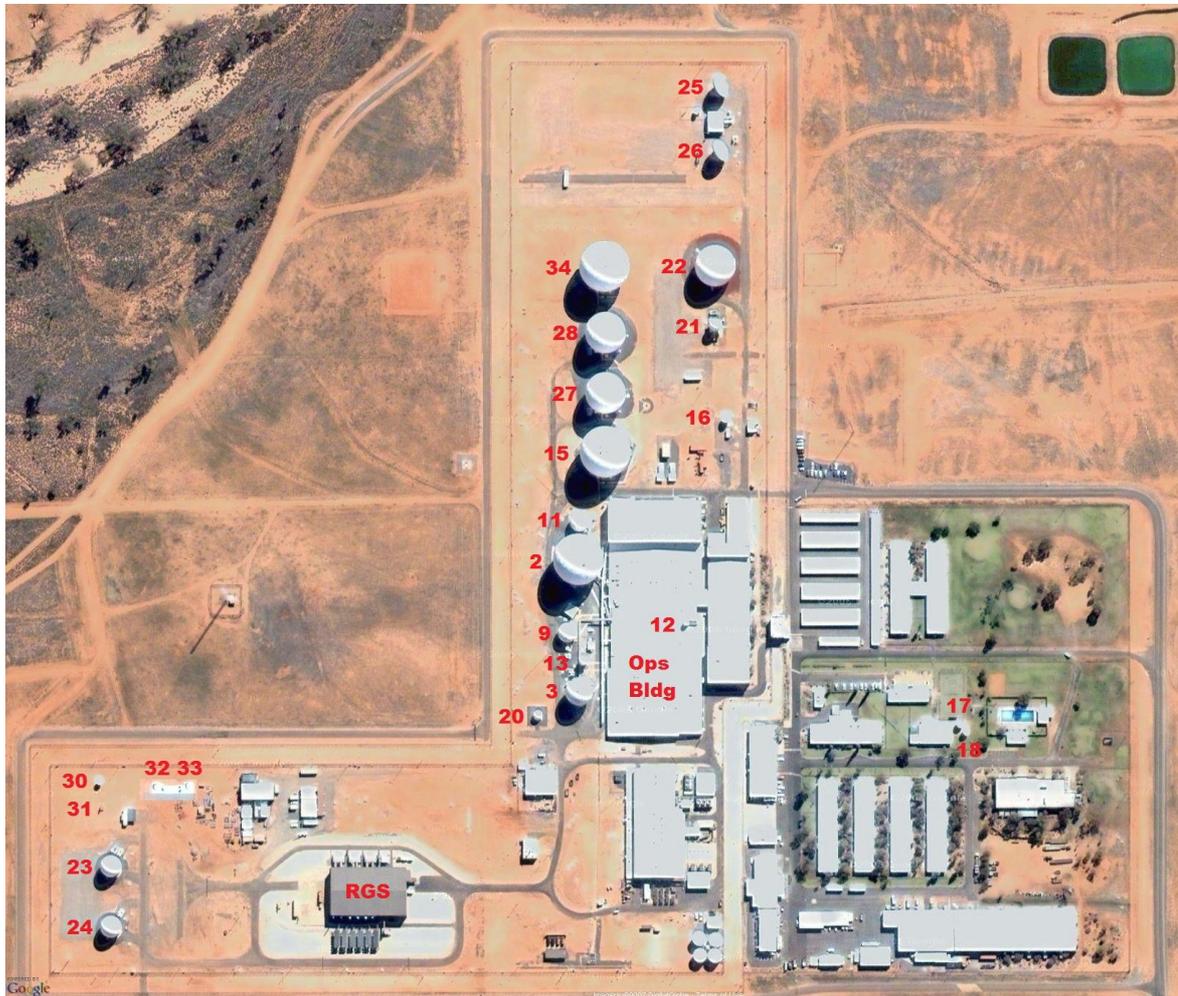


Figure 10: Joint Defence Facility Pine Gap
 (photokey prepared by Bill Robinson – see Attachment 1)
 Source: Google Earth

However it is not simply a matter of an increased number of targets and a proportional expansion of satellite capacities. NRO Director Bruce Carlson noted that long-lived and expensive space assets actually change much more slowly than tasking requirements.

“If you look at the TCPED [Tasking, Collection, Processing, Exploitation and Dissemination] process, only the collection comes from space. The rest of it is done on the ground ... So if you want to change the way you’re doing business, you have to change the way you’re doing business on the ground.”⁹²

⁹² General Bruce Carlson USAF (Ret). “[National Reconnaissance Office Update](#)”, National Reconnaissance Office. (13 September 2010). p. 7.

Carlson was pointing to dramatic advances in SIGINT capacities derived from an aggressive NRO launch schedule, organisational changes, and changes in ground technologies. The demands, particularly for military tactical intelligence, have driven ground system development and reorganisation to the point, where he boasted in 2010, “very, very shortly, within the very near term, we will be able to target using signals intelligence.”⁹³

Part of those shifts have involved an integrative revolution in collection, analysis and distribution of signals intelligence, all of which have affected Pine Gap. US signals intelligence capabilities have become highly integrated in four ways,:

- Previously separate or “stove-piped” national-level signals intelligence analytical facilities in the US system such Pine Gap or Menwith Hill, which previously dealt primarily only with the product of “their own” satellites, have become more closely inter-linked in their control, downlinking and processing and analytical functions. As a consequence Pine Gap now has a capacity to share tasks previously only performed by other US facilities. At the end of the Cold War the Tactical Exploitation of National Capabilities (TENCAP) programme was implemented in all intelligence agencies, beginning the replacement of the stove piping of Cold War specialised intelligence capacities. Data from the DSP/SBIRS system is now widely diffused through the highly mobile and readily set up Joint Tactical Ground Stations (JTAGS).⁹⁴
- Signals intelligence data and analysis from space-based and other platforms has been integrated with imagery and human intelligence from a wide variety of other sources to generate complex “mosaics” of intelligence of all kinds. Much of this data is available at near real time speeds.
- Space-based signals intelligence, as well other forms of technical intelligence, is disseminated through the Department of Defense Intelligence Information System (DODIIS), that provides an information systems architecture for networked warfare, “a robust and flexible intelligence capability for subordinate joint forces as long as supporting communications lines are available. DODIIS tools support the movement of intelligence between DIA, the CCMDs, the Services, and other intelligence production and customer activities worldwide.” This will, it is claimed, incorporate more than a dozen currently separate intelligence databases and components including the Joint Worldwide Intelligence Communications System (JWICS) and SIPRNet, the Secret-level wide-area network, rendered accessible through MUOS and other mobile and handheld devices.⁹⁵
- Data from space-based intelligence is not only downlinked in the US theatre commands in Afghanistan (and formerly Iraq), but is available to at least middle-level combat commands and possibly at lower levels still. Consequently, such data has a direct role to play in intelligence, surveillance and reconnaissance requirements of

⁹³ *Ibid.*, p. 8.

⁹⁴ Edward P. Chatters IV, and Bryan Eberhardt. “[Missile Warning Systems](#)”, in AU-18 Space Primer, Air University Press, September 2009, p. 230.

⁹⁵ Joint Chiefs of Staff. [Joint and National Intelligence Support to Military Operations](#), Joint Publication 2-01, 5 January 2012, pp. V-2 - V6; and Fritz et al., *op.cit.*, pp. 34-36.

ground- and air-operations in Afghanistan and Iraq, and most likely drone strikes in Yemen and Sudan.⁹⁶ As NRO head Carlson put it the NRO is “doing tactical intelligence collection that leads us to actionable intelligence on bad guys every day.”⁹⁷

The DSP and SBIRS systems are undergoing a similar pattern of integration in analytical production and in integration with other types of technical intelligence. The DSP and SBIRS systems’ primary missions are to provide “tracking and targeting capabilities for missile early warning/defense, battlespace awareness and technical intelligence.”⁹⁸ In the Gulf War, and again in the invasion of Iraq in 2003, the DSP satellites downlinked through Pine Gap provided real-time information about Scud missile launches.⁹⁹ The DSP and SBIRSs program have had a long involvement in US and allied missile defence development and deployment.¹⁰⁰ Without the cuing provided from DSP/SBIRS detection of launch and tracking of boost phase trajectories, it is unlikely that US and Japanese sea- and ground-based missile defence radars would be able to effectively target adversary missiles. The two western most dishes (10 m. in diameter), and two smaller dishes nearby, make up the DSP/SBIRS Remote Ground Station, staffed by only three or four people with an operations and administration building.¹⁰¹

The Australian role Ball documented up to 1990 has continued to expand in the ensuing decade, as has the value government places on the facility. In September 2006 the Minister for Defence, Brendan Nelson, nominated the Joint Defence Facility Pine Gap as one of the examples of “increased integration that have emerged since 2001” between Australia and the United States. He went on to describe the Facility as “perhaps the definitive example of integrated collaboration and intelligence effort”. “The facility’s two principal roles – the collection of intelligence and the provision of ballistic missile early warning – have become even more vitally important in recent years.”

The two northern most radomes are the Australian downlinks for DSP/SBIRS intelligence.¹⁰² Project DUNDEE was a joint US-Australian test of sensor and tracking capacities of the Jindalee over-the-horizon radar and other sensors to track the boost phase of short range ballistic missiles – both as an Australian contribution to the alliance, and as a matter of practical interest to Australian defence.¹⁰³ Reportedly the Defence

⁹⁶ Former long time Pine Gap NSA electronic intelligence analyst David Rosenberg reports a Pine Gap role in providing intelligence for the wars in Kuwait, Kosovo, Iraq and Afghanistan, including the provision of tactical intelligence to planners; the pursuit of the Al Qaeda leadership from 1998 onwards; the targeting of the communications of the Iraqi leadership at the start of the Iraq invasion; monitoring of the North Korean nuclear tests; rescue of downed USAF pilots; and the assessment of Chinese airborne AWACS radar performance; as well as monitoring of missile testing by Russia, China, Iraq, Iran, North Korea and Libya. Rosenberg, *op.cit.* pp. 82-113."

⁹⁷ Carlson, *op.cit.*, p. 8.

⁹⁸ U.S. Air Force Fact Sheet, *Infrared Space Systems Directorate*, Los Angeles Air Force Base, 13 January 2012.

⁹⁹ See documents cited in Jeffrey T. Richelson (ed.) *Space-Based Early Warning: From MIDAS to DSP to SBIRS*, National Security Archive Electronic Briefing Book No. 235, 9 November 2007.

¹⁰⁰ Desmond Ball, “The strategic essence”, *Australian Journal of International Affairs*, 55, no. 2 (2001); Richelson, *Space-Based Early Warning*, *op.cit.*; Richelson, *America’s Space Sentinels*, *op.cit.*, pp. 232-24; Richard McMillan, *AEGIS TMD: Implications for Australia*, Australian Defence College, Monograph Series, No. 1, 2002.

¹⁰¹ Ball, “The strategic essence”, *op.cit.*, p.242.

¹⁰² Ball, “The strategic essence”, *op.cit.*, p. 243.

¹⁰³ McMillan, *op.cit.*

Science and Technology Organisation (DSTO) used this access to test the potential for DSP/SBIRS data to detect any incursion into Australia by aircraft or cruise missiles.¹⁰⁴

At least three Australian government elements are located at Pine Gap. The primary Australian agency is the Department of Defence, and within the department, the Strategic and International Policy/Intelligence Division. Secondly, uniformed personnel are also drawn from the Defence Department's Defence Signals Directorate, the primary national signals intelligence agency.¹⁰⁵ Thirdly, there is a permanent force from the Australian Protective Service, part of the Australian Federal Police. In 2002, the Australian government stated that "All arms of the Australian Defence Force and US Armed Services have personnel integrated into the Joint Defence Facility Pine Gap workforce." The cost to the Australian government was \$8.4 mn. in 2001-2002¹⁰⁶, approximately \$12 mn. in 2006-7, and \$14 mn. in 2007-8.¹⁰⁷ (See Attachment 3)

3.5 Geospatial and imagery intelligence cooperation and integration

In a secret agreement signed during the 2008 AUSMIN consultations, the Australian and US governments committed to intensified cooperation and intelligence sharing with imagery and geospatial intelligence derived from satellites and reconnaissance aircraft. According to a US embassy cable released by Wikileaks, the agreement contained a "statement of principles on geospatial intelligence co-operation", and is designed "to take GEOINT co-operation to the same level that signals intelligence has reached between the two countries". Noting that the 2009 defence white paper stated the acquisition of an Australian surveillance satellite was "a high priority", Philip Dorling reported that the US National Reconnaissance Office, which operates US high resolution imaging and synthetic aperture radar surveillance satellites, is "understood to be closely involved with the Australian project and the Australian surveillance satellite will probably form part of a constellation of satellites it operates."¹⁰⁸

4. Asymmetrical cooperation and "the joint facilities"

Successive Australian governments in recent decades have referred to Pine Gap and other bases as "joint facilities", and insisted that there are no US bases in Australia.¹⁰⁹ However, the cooperation involved is fundamentally and inherently asymmetrical. It is clear that there are a variety of degrees to which military and intelligence facilities in Australia to which the United States has substantial access can be appropriately regarded as "joint facilities". In 1978, the Department of Defence provided Parliament with a list (albeit incomplete and misleading) of defence-related facilities in Australia with foreign involvement. In 1968 there were four "operated by a foreign power", including North West Cape and three seismic and atmospheric nuclear monitoring stations, and none in

¹⁰⁴ *Ibid.*, p. 55.

¹⁰⁵ It is not clear how many personnel from the Defence Department's Defence Intelligence Organisation, the military's intelligence analytical agency, are permanently deployed at Pine Gap.

¹⁰⁶ *Defence: Pine Gap (Question No. 286)*, Answers to Questions on Notice, Hansard, House of Representatives, 28 May 2002, pp. 2555-6.

¹⁰⁷ *Joint Defence Facility Pine Gap*, Answers to Questions on Notice, Hansard, House of Representatives, 16 June 2008, p. 5030.

¹⁰⁸ Philip Dorling, "[Australia and the US agree on a spy satellite deal](#)", *Sydney Morning Herald*, 7 February 2011.

¹⁰⁹ Judith Ireland, "[US marines not a 'US base' on Australian soil: Smith](#)", *The Age*, 4 April 2012.

1978. In 1968 three were “operated jointly by Australia and a foreign power”, and seven in 1978, including Nurrungar, Pine Gap, and North West Cape.¹¹⁰

In recent years the Australian government has been insistent on the joint character of any cooperative activity within Australia with US military forces and intelligence agencies. The ratification of the 2008 treaty concerning US access to the once again joint North West Cape facility confirmed that the treaty “includes a requirement that US use of the Station be in accordance with the Australian Government’s policy of full knowledge and concurrence.”¹¹¹ Following the announcement in late 2011 of the deployment of the Marine Air-Ground Task Force (MAGTF) and US Air Force elements to northern Australia, the Australian and US government officials insisted that this would not involve “US bases” on Australian soil. Rather there would be rotations of these forces through Australian facilities – albeit, as a White House spokesperson admitted, this will be a matter of “constant rotation”.¹¹² Referring to the Darwin MAGTF deployment, former National Security Council director Michael Green said “the new facility is for all intents and purposes a base”.¹¹³

There are in fact now three different categories of “jointness” involved in the US military and intelligence presence in Australia (see Table 2):

4.1 ADF bases with US access

For the most part, the US military has access to all major ADF training areas, Northern Territory RAAF airfields (and other northern “bare bones” airfields), port facilities in Darwin and Fremantle, and with possible future access to an airfield on the Cocos Islands. The actual level of access is variable, but will certainly increase with the full deployment of the MAGTF and USAF elements, and with the planning for the US Navy access to HMAS Stirling in Fremantle now underway.

4.2 ADF/US military co-located

Two Australian bases have, or will shortly have, co-located US military facilities. Robertson Barracks in Darwin will house permanent US command, communications and logistics elements to service the 2,500 Marines on constant rotation through the base. This will require considerable expansion of the ADF base on top of its recent substantial expansion. The two part physical expansion of the Australian Defence Satellite Communications Ground Station at Kojarena for the US MUOS facility and the shared WGS facility has already been mentioned.

Just how functionally separated the US elements will be is not yet clear. In the case of Kojarena much will depend on whether, as seems likely, existing trends towards

¹¹⁰ *Defence-related Facilities: Foreign Involvement (Question No. 1253)*, Answers To Questions Upon Notice, Commonwealth Parliamentary Debates 10 October 1978.

¹¹¹ [Australia-United States Exchange of Letters Relating to Harold E. Holt Naval Communications Station](#), AUSMIN 2010, Department of Foreign Affairs and Trade. For discussion of the phrasing see Tanter. “North by North West Cape, *op.cit.*”

¹¹² *Press Briefing [Full Text]*, Jay Carney, Press Secretary; Ben Rhodes, Deputy National Security Advisor for Strategic Communications; Danny Russel, NSC Senior Director for Asia – Canberra, Australia, November 16, 2011.

¹¹³ “The Asia pivot is both political, and good policy”, Mike Green interview with Peter Ennis, *Dispatch Japan - News and Views on the US, Japan, and US-Japan Relations*, 20 February 2012, at <http://www.dispatchjapan.com/blog/2012/02/mike-green-the-asia-pivot-is-both-political-and-good-policy.html>.

communications systems integration continue to deepen, and the degree to which security issues segregate ADF and US activities. And in the case of Darwin and Robertson Barracks, much will depend on the degree and types of cooperative and collaborative training and operations that the ADF and the MAGTF become involved in. But the Robertson Marine presence will be permanent, and will grow beyond the current nominal MAGTF target of 2,500.

Table 2. Principal locations of United States military and intelligence presence at Australian facilities

Australian bases to which the United States has access	Australian bases co-located with United States facilities	Primarily United States bases, with a limited Australian role
RAAF Tindal	Robertson Barracks	Joint Defence Facility Pine Gap
RAAF Darwin	Australian Defence Satellite Communications Ground Station	Naval Communication Station Harold E. Holt
HMAS Coonawarra, Darwin		
Bradshaw Field Training Area		
Delamere Air Weapons Range		
Mount Bunday Training Area		
Joint Australia-US Combat Training Centre		
Shoalwater Bay Training Area		
Townsville Field Training Area		
Cowley Beach Training Area		
HMAS Stirling, Fremantle		
Cocos islands (proposed)		

4.3 American bases, with Australian access

North West Cape is nominally returning to its formerly joint status. However, neither part of the renewed US activities at North West Cape – submarine VLF communication and space radar sensing – is likely to involve high levels of direct Australian participation, and the base should be regarded as returning to an essentially American one. The RAN

does operate the VLF facility at present, and it is not yet clear precisely how the US intends to use its renewed communications access, but if as is likely it involves communication with submerged attack submarines, it is highly unlikely there will be substantial direct Australian involvement, whatever the level of wider maritime RAN-USN cooperation. While the costs of running the new communications operations are to be shared between the two countries, the giant VLF transmission and reception facility was built by the United States, and for its own purposes. Incidentally it has become useful to the RAN's limited submarine activities, but the *raison d'être* for the base remains an American one.

Little detail of the North West Cape space surveillance radar project is yet available. At least nominally the facility will be joint.¹¹⁴ Space has risen in Australian defence priorities in recent years, with the ADF establishing a Joint Space Operations Cell within Headquarters Joint Operational Command, and the 2011 Talisman Sabre multinational exercise focussing on rectifying perceived deficiencies in Australia's space operations capacities.¹¹⁵ Whatever Australian involvement (and there already is some) the dedicated Space Fence operations will be a deeply American affair. Certainly the Obama administration is actively pursuing international partnerships on space surveillance and operationally responsive space, as well as satellite communications, hosted payloads, but it is not yet clear what these will mean in practice, and what the operational meaning of "joint" and "partner" will turn out to involve. The difficulty, from the US side, "is to find the right mix of a "US-only" independent capability along with an "inter-dependent" set of capabilities and with the right international partners."¹¹⁶

To date the only non-US element of the overall the current worldwide Space Surveillance Network is RAF Fylingdales, the site of a longstanding RAF-operated Ballistic Missile Early Warning System (BMEWS) phased array radar that provides "collateral support" to the dedicated SSN.¹¹⁷ All the other dedicated, "collateral" and "contributing" sensors are American. As well as with Australia, the United States has been establishing Space Situational Awareness Partnerships with a number of countries, including Canada, France and Japan to date.¹¹⁸ In the Canadian case, a Sapphire space-based electro-optical sensor system will be a "contributing sensor" to the SSN.¹¹⁹ There are no specifics of further Australian contribution to the SSN beyond the US space radar at North West Cape at this stage, although Defence is an enthusiastic supporter of SSA, and Defence scientists have expressed interest in the proposal for an allied Combined Space Operations Centre, currently under discussion in NATO.¹²⁰ While there are already

¹¹⁴ Pownall, *op.cit.*

¹¹⁵ "[Aussies and Yanks: Pacific Space Support Element Reaches Three Goals in Exercise](#)", *Army Space Journal*, (Fall 2011), p. 33.

¹¹⁶ Peter L. Hays and Dennis L. Danielson. "[Improving Space Security through Enhanced International Cooperation](#)", *High Frontier*, 6, No.2 (February 2010): 14.

¹¹⁷ United States Government Accountability Office. *Space Acquisitions: Development and Oversight Challenges in Delivering Improved Space Situational Awareness Capabilities*. Report to the Subcommittee on Strategic Forces, Committee on Armed Services, House of Representatives. GAO-11-545, May 2011, p. 38.

¹¹⁸ Richard McKinney, "[Developing a More Collaborative US Space Policy](#)", RUSI Space and UK National Security Conference Panel: "International Trends and Developments in Space Policy", Royal United Services Institute, London, (14 June 2011), p. 6.

¹¹⁹ Titus Ledbetter III, "[U.S., Canada Agree to Share Space Surveillance Data](#)", *Space News* (23 May 2012).

¹²⁰ Garry Newsam and Neil Gordon. "[An Update on SSA in Australia](#)". Advanced Maui Optical and Space Surveillance Technologies (AMOS) Conference, 2011. See also the discussion in Jana Robinson, "Space security through the transatlantic partnership", *Space Policy*, 28 (2012) :61-63; and Tiffany Chow, "Space Situational Awareness Sharing Program", *SWF Issue Brief*, Secure World Foundation, (22 September 2011).

Australian (and Canadian and British) liaison officers embedded at the Joint Space Operations Center (JSpOC) it is not clear that this indicates that Australian personnel will have a central role in the space radar operation, and it is difficult to imagine any foreign partner role in US Space Command space war-fighting.¹²¹

Pine Gap, historically, and still today, is the shared facility about which successive Australian governments have been most insistent as to its joint status – for entirely understandable reasons given the widespread understanding of and barely suppressed concern about its longstanding nuclear target status. Yet the judgement Ball made almost a quarter of a century ago, after the achievements of the Hawke government in obtaining US commitment to a fuller measure of Australian participation, remains true for the most part today:

“Although there is now full Australian participation in the operations at Pine Gap, it remains the case that the station is essentially a U.S. facility, it would not have been established except to satisfy U.S. strategic intelligence interests; and very little of the intelligence collected at the station is of direct relevance.”¹²²

Except for the two DSP downlink terminals dedicated to Australian access and from which Australia derives considerable regional maritime intelligence it values, the great expansion of the facility since that time has been driven by American concerns, built by the United States, paid for by the United States, and commanded by the United States. Were the United States to withdraw from its activities at Pine Gap, there would be nothing autonomous of significance left for Australia to operate.

Despite the comparable numbers of Australians working there, the reportedly considerable Australian access to product from the DSP and SIGINT satellites, and the value the Australian government places on that access, Pine Gap is, as it always has been, an American base, to which Australia is granted some access. The extraordinary changes in the US global intelligence architecture resulting in systemic horizontal and vertical integration in the space and ground elements of the US space-based SIGINT have bound Pine Gap to that wider American system in ways that make questions of Australian sovereign control close to a matter of fantasy.

In fine, the question of “jointness” is a matter of understanding the profound asymmetries within which Australia-US military and intelligence cooperation takes place – as it does for the each of the small countries in the UKUSA community. Richelson and Ball estimated in 1985 that Australia, Canada and New Zealand between them contributed perhaps 2% of the budgets and personnel of all agencies within the UKUSA community.¹²³ Both budgets and staffing of all these agencies have swollen since then, but there is little reason to think these proportions have greatly changed.

As the examples of Pine Gap and North West Cape demonstrate, Australia may be contributing to, and “participating” in, a remarkably globalised, integrated and powerful space-based system of intelligence, surveillance and reconnaissance, ever more closely

¹²¹ [Statement of Lieutenant General Susan J. Helms, Commander, Joint Functional Component Command For Space, before the Subcommittee on Strategic Forces, Senate Armed Services Committee on Space Posture, 11 May 2011](#); Raymond Hoy, “DoD’s Eye in the Sky Supporting Troops on the Ground”, *News*, US Air Force, (17 April 2009).

¹²² Ball, *Pine Gap*, *op.cit.*, p. 94.

¹²³ Richelson and Ball, *The Ties That Bind*, *op.cit.*, p. 303.

tied to effective utilisation in combat – including by Australian forces in niche roles with US forces. But that systemic character itself further lessens the chances that the much vaunted Australian “seat at the table” brings a speaking role. To be sure, there are variations between facilities and over time, but for the core intelligence and now space surveillance facilities, and for certain communications facilities, claims of a genuinely joint and collaborative character are either illusions to assuage national pride or discursive distractions to deflect public attention from the true, and indeed over-determined, American character of the most important facilities. The bases do involve cooperation, and indeed increasing levels of cooperation and integration with US systems, but the consequences of the asymmetries of that cooperation need continual reassessment of benefits and risks, and an accounting of questions of sovereignty.

5. Re-visiting the grand bargain

In *A Base for Debate* Ball set out five areas of debate on the bases:

- the degree to which the bases enhance deterrence rather than nuclear war-fighting;
- the extent to which they are important for arms control purposes;
- the likelihood and consequences of them being nuclear targets;
- whether the operations at the bases are compatible with Australian sovereignty; and
- the constraints hosting the bases places on more independent Australian defence and foreign policies.¹²⁴

Ball made it clear in “The strategic essence” that he saw the benefits derived from hosting the bases not only as the price of attaining the goal of “Australian self-reliance in credible defence contingencies”, but indeed essential.

In fact, it is the historicity of the defence argument that compels periodic reassessment. But they also suggest a more extended set of questions in addition to those Ball asked:

- Are the specifically nuclear risks and costs derived from hosting the bases still balanced as Ball saw them?
- Are threats to Australia such that they can only be countered with only higher levels of US military equipment?
- Are threats to Australia such that the invocation of US assurances of extended nuclear deterrence is an appropriate response?
- What is the relationship between extended nuclear deterrence in Australian defence policy and the global deterrence justification for the retention of Pine Gap?
- Does the seat at the table in Washington come with a speaking role, and is it ever used?
- How significant and how irreplaceable is the intelligence Australia receives from the American facilities?

¹²⁴ Ball, *A Base for Debate*, *op.cit.*, pp. 86-87. In the list of differences between the bases cited earlier from the same book Ball added a sixth dimension: “the extent to which their location in Australia is simply a matter of convenience.”

- Are there non-nuclear costs to hosting the American bases and more generally from the alliance embrace?
- Does the role of American bases in Australia contribute to competitive or cooperative security approaches to space?
- Is there a relationship between the hosting of the bases and a willingness to contribute forces to US-initiated wars that neither contribute to Australian strategic interests nor receive enduring public support?¹²⁵
- Are there indirect and structural consequences of military and intelligence integration with the United States as articulated through the bases such that more independent Australian defence and foreign policies become more difficult to identify and realise?

Most of these questions have been asked at one time or another in the past, but it is now clear that the questions about strategic consequences of hosting the bases must move beyond acceptance of the maintenance of stable nuclear deterrence as conceived of in the 1980s.

Firstly, does hosting the bases have consequences for the likelihood of movement beyond the snail's pace of disarmament to which the world has become accustomed to enhancing movement towards the goal of nuclear abolition? Will there be a point where it is in Australia's interests to push the United States towards more serious disarmament moves by indicating that previous formulations of the acceptability of the bases because of their contribution to nuclear deterrence may no longer be adequate? Is there a link between reliance on extended nuclear deterrence and the hosting of the bases? Has the time passed when a move towards national nuclear free status, following New Zealand, would provoke an alliance crisis founded on a US interpretation of extended nuclear deterrence as globally indivisible, and withdrawal incommensurable with the Australian-US military and integration through the bases?¹²⁶

Secondly, how does the calculus of balancing the costs of hosting Pine Gap against its contribution to "stable nuclear deterrence" sit with the multipolar nuclear world today where the number of nuclear armed states is nine and rising? As is often remarked, models derived from the uneasy Cold War acceptance of a bilateral posture of mutually assured destruction do not fit well in this situation, where actual deterrence postures – say, that of China – already involve multiple deterrence relationships with the US, Russia and India. Is the responsible pathway then for an Australian government merely to continue to support, through the hosting of a unilateral nuclear verification (and targeting) facility, for one player? What actual and possible roles could – and should – the capacities of Pine Gap play in the many more complex scenarios that could rapidly unfold? Especially as the US-led race to secure space dominance opens a new realm of

¹²⁵ For a vigorous discussion of the German parallel, answered not only in the affirmative, but with a strong approbation, see Michael Rühle, *Good and Bad Nuclear Weapons: Berlin's Part in Shaping Nuclear Reality*. Körber Policy Paper 3 (April 2009). In the light of the somewhat brutal clarity of Rühle's basic argument, if "German nuclear weapons" are replaced by "Australian hosting of American bases" then what Rühle sees as the strategic and moral necessity of German involvement in unpopular American wars as the price of assured extended nuclear deterrence brings up interesting Australian parallels.

¹²⁶ The New Zealand visit of US Defense Secretary Leon Panetta to announce resumption of military and intelligence cooperation was a long overdue recognition that the Lange Labour Government's 1984 policy of banning the entry of nuclear-armed ships is not incompatible with an alliance with the United States. Richard Tanter, "Standing upright there: the New Zealand path to a nuclear-free world", *Nautilus Institute, NAPSNet Policy Forum*, 3 October 2012.

strategic competition imbricated in complex and most likely unpredictable ways with both the nuclear weapons system and the intelligence and military systems to which Pine Gap is linked.

Thirdly, given Pine Gap's substantial and increasing role in the wars in Afghanistan and Iraq, are there strategic or moral linkages that need reconsideration?¹²⁷ To take but one example, space-based signals intelligence intercepts of mobile telephone transmissions by the Iraqi high command led directly to US Air Force bombing strikes attempting "decapitate" the Iraqi leadership in the initial stages of Operation Iraqi Freedom. These "Time Sensitive Target" decapitation strikes missed their nominal leadership targets (Saddam Hussein and his sons), but resulted in the deaths of large numbers of Iraqi civilians as collateral casualties or unintended casualties. There is a very strong likelihood that in the context of the highly developed forms of US intelligence integration outlined above the signals intelligence capability of the Pine Gap facility has contributed to other US strikes in Iraq and Afghanistan that have resulted in the deaths of civilians, whether as collateral casualties or unintended casualties.

6. The resistant centre: Pine Gap reassessed

Inevitably, any consideration of Ball's work on the American bases in Australia finally circles back to the centre of that work, both in the Australian imaginary and in strategic fact: Pine Gap. For Australians there are two vital conclusions Ball reached a quarter of a century ago that must be re-tested by each generation. The first concerns Ball's conclusion, since confirmed by senior Australian officials such as Paul Dibb, that Pine Gap was a high priority nuclear target for the then Soviet Union.¹²⁸ The second is his substantial if reluctant two part conclusion to the question of whether, on balance, the retention of Pine Gap is in the Australian national interest and the wider human interest. That is, that on the basis of the contribution Pine Gap makes to arms control and disarmament, and because for technical reasons there is no possibility of relocating it elsewhere, whoever speaks for arms control must speak for Pine Gap.

While many in the Australian peace movement who admired and drew on Ball's work were dismayed by the second conclusion, few were more aware of the ghastly tensions between these two conclusions than Ball. We have already cited his early informed conclusion that the pursuit of the "chimera of controlled nuclear war" would best be replaced by "greater attention to the conditions of conventional deterrence." Equally, his concern for accuracy and precision was not a mere matter of the sometimes chilling edges of realism, but a strongly moral position, as when he chided Carl Sagan and his colleagues for overstating the nuclear winter case, saying

"I thought that it was just as wrong to overestimate the possible consequences of nuclear war, and to raise the spectre of extermination of human life as a serious likelihood, as to underestimate them (e.g., by omitting fallout casualties)."¹²⁹

¹²⁷ For an introductory outline of the issue, see [Off Target: The Conduct of the War and Civilian Casualties in Iraq](#), New York: Human Rights Watch, 2003.

¹²⁸ For example, Paul Dibb. "America has always kept us in the loop", *The Australian*, 10 September 2005.

¹²⁹ Desmond Ball, [The Probabilities of "On the Beach": Assessing "Armageddon Scenarios" in the 21st Century](#). Working Paper No. 401, Strategic and Defence Studies Centre, Australian National University, Canberra, (May 2006), pp. 4-5.

6.1 Pine Gap as nuclear target

Yet when it came to the risks Pine Gap's target status brought to the population of Alice Springs, or possibly Adelaide, and the abject failure of Australian authorities to approach the question of civil defence protection for those populations seriously, Ball's anger was clear. While in fact Ball was a defender of the grand bargain at the heart of the alliance – Pine Gap is the price Australia pays for the global nuclear balance, and access to US technology to sustain the “knowledge edge” – he could never have adopted the unapologetic – indeed insouciant – mandarin tone that Paul Dibb did in 2005, looking back at the calculus of mass death the defence establishment ensured was never presented for democratic debate:

“US intelligence also helped us to assess the risk of Soviet nuclear strikes on Australia in the event of global nuclear war. We were able to identify the locations in Australia that were targeted by Moscow and assess likely casualties. We judged, for example, that the SS-11 ICBM site at Svobodny in Siberia was capable of inflicting one million instant deaths and 750,000 radiation deaths on Sydney. And you would not have wanted to live in Alice Springs, Woomera or Exmouth -- or even Adelaide.”¹³⁰

Similarly, after leaving office former Minister for Defence Kim Beazley said, apropos the Hawke government's siding with the United States against nuclear-free New Zealand,

“we accepted that the joint facilities were probably targets, but we accepted the risk of that for what we saw as the benefits of global stability.”¹³¹

While in office, neither the minister nor the deputy secretary of defence said anything remotely comparable, alerting Australian citizens to the dangers, and providing sufficient information to the Australian citizenry to allow a process of democratic will formation as to whether they agreed with the Faustian bargain made on their behalf.

The first question today is whether Pine Gap remains a likely high priority nuclear target. Clearly, the threat of all-out nuclear war between the US and Russia is much less than at any time in the Cold War. Mutual deterrence between the US and Russia is accepted by both sides, and despite the destabilising implications of US deployment of ballistic missile defence systems in Europe, has moved into the background to a position in the two nuclear superpowers relations that Patrick Morgan has described as “recessed deterrence”.¹³²

¹³⁰ [Testimony of Professor Paul Dibb](#), *op.cit.*

¹³¹ Kim Beazley, presentation to Seminar on the ANZUS alliance, Joint Standing Committee on Foreign Affairs, Defence and Trade, Parliament of Australia (11 August 1997).

¹³² See Patrick Morgan, “Considerations Bearing on a Possible Retraction of the American Nuclear Umbrella Over the ROK”, Project on Improving Regional Security and Denuclearizing the Korean Peninsula: U.S. Policy Interests and Options, National Committee on North Korea (October 2009); and Patrick M. Morgan, “[Reflections on Contemporary Issues on Extended Nuclear Deterrence](#)”, Research workshop on Australia-Japan Civil Society Cooperation for Nuclear Disarmament, Nautilus Institute at RMIT, 18-19 September 2009; and Richard Tanter and Peter Hayes, “[Beyond the nuclear umbrella: re-thinking the theory and practice of nuclear extended deterrence in East Asia and the Pacific](#)”, *Pacific Focus*, Vol. 26, No. 1 (April 2011), pp. 8-9.

China, the country that the US and Australian defence establishments do consider a serious nuclear threat¹³³, has a very much smaller nuclear arsenal than the US or Russia under its policy of the “minimal means of reprisal”. While the United States has not yet formally acknowledged that it is in a relationship of mutual deterrence with China¹³⁴, there must be more serious uncertainties about how that limited number of weapons will be deployed than in the case of the overkill paradigm cases of the US or Russia. With that caveat, the question remains of whether Pine Gap today is still a tempting and potentially high priority target for a country with the will and means to engage in nuclear war with the United States.

There have been no statements by Australian government officials in recent years comparable to those made by Beazley and Dibb after leaving office concerning the attitude of the governments in which they served in the 1980s and 1990s. However, in mid-2012 in his study of Australian economic and defence policy towards China titled *The Kingdom and the Quarry* the journalist David Uren reported that in a “secret appendix” to the 2009 Defence white paper

“defence thinking is that in the event of a conflict with the United States, China would attempt to destroy Pine Gap.”¹³⁵

Uren subsequently confirmed that the document concerned was the classified Force Posture Review. Uren noted that according to his informants the Review did not necessarily describe the expected attacks as “nuclear”, but rather as “missile” attacks.¹³⁶ A spokesperson for the Minister for Defence issued an immediate denial, though one couched in restrictive terms.¹³⁷

In the absence of a clear statement by the Australian government, the question of whether Pine Gap remains a nuclear target today can be answered by considering the likely consequences of the two distinct roles of Pine Gap: the DSP/SBIRS remote ground station uplinking and downlinking command, control and data from infrared imaging satellites; and the far larger complete onsite command, control, data down-link, and data processing functions for the geo-stationary signals intelligence satellites. The DSP/SBIRS satellite constellation and its ground-stations at Buckley in the US and Pine Gap continue to provide both early warning of missile launches (and aircraft and explosions with a detectable thermal signature) and assist in attack preparation and targeting, and in missile defence. Destroying or significantly degrading the DSP/SBIRS

¹³³ Pace the absurdities of the 2009 Defence White Paper with its “remote risk” of nuclear threat from Iran and North Korea. *Defending Australia in the Asia Pacific Century: Force 2030, Defence White Paper 2009*. Commonwealth of Australia, p. 39.

¹³⁴ The assessment of the politically and strategically important issue of whether the United States has recognized that it is in a mutual deterrence relationship with China was complicated by shifts from previous US policy evident in the 2012 Nuclear Posture Review. Alasdair Iain Johnston, for example, argues that the 2010 NPR “implicitly calls for a mutual deterrence-based strategic stability”. See his [“Stability and Instability in Sino–US Relations: A Response to Yan Xuetong’s Superficial Friendship Theory”](#), *Chinese Journal of International Politics*, Vol. 4, (2011), p. 11.

¹³⁵ David Uren, *The Kingdom and the Quarry: China, Australia, Fear and Greed*, (Melbourne: Black Inc., 2012), p.128.

¹³⁶ Letter to the author, 18 June 2012.

¹³⁷ “The Minister again consulted with the senior officials who prepared the force structure review who again advise that the assertions made by Uren in his book which have been the subject of newspaper reporting since last Saturday are not correct and erroneous and are not contained in the force posture review as presented to, or considered by, Government.” [“Questions and responses provided to Greg Sheridan, The Australian, on 8 June 2012”](#), Stephen Smith MP, Minister for Defence, 9 June 2012.

system – the thermal signature monitoring “eyes in space” of the US targeting system – would undoubtedly be a priority objective. Yet destroying the Pine Gap Remote Ground Station would not greatly impair these capacities of the DSP/SBIRS system, because there are reportedly functionally adequate, multiple robust communications redundancies which would allow continued communications from the Buckley control station to the satellite previously controlled via the Pine Gap RGS. In Ball’s words, these communications redundancies render the Pine Gap and other Remote Ground Stations “really quite marginal elements”, and hence unlikely nuclear targets.¹³⁸

The situation concerning Pine Gap’s principal, signals intelligence, function has some similarities, but also differences that almost certainly lead to a more pessimistic conclusion. The increase in sensitivity, coverage, targets and global systemic intelligence integration further increases the already high Cold War priority for targeting the American system of space-based electronic intelligence, particularly the geosynchronous satellite elements. Unlike Pine Gap’s limited role as a Remote Ground Station for the early warning DSP/SBIRS system, Pine Gap’s signals intelligence role is very different, with a very direct and substantial responsibility for satellite station-keeping, controlling satellite house-keeping and monitoring activities, commanding satellite surveillance operations, and receiving and processing downlinked data. In itself, this renders Pine Gap a lucrative and reasonably high priority target.

While Ball provided a detailed account of the communications capacities of the early SIGINT geosynchronous satellites, little is known of the communications architecture of the current constellation of Advanced Orion/Mentor satellites. There have been attempts to establish redundancies for communications systems for the SIGINT geosynchronous satellites, but these do not appear to have reached the point where satellite crosslinks are viable replacements for the vital uplink and downlink communications through Pine Gap. The satellite-satellite crosslinks that are in place for the Advanced Orion/Mentor signals intelligence satellites are unlikely to have the capacity to process huge amounts of SIGINT data onboard to transmit in secure encrypted form via a satellite crosslink.¹³⁹ Consequently, attacking Pine Gap almost certainly remains a plausible and lucrative way of degrading or destroying the US geosynchronous signals intelligence capability – the “ears” of nuclear war-fighting capacity.

6.2 Pine Gap and conventional wars

The role of both facilities at Pine Gap in the wars in Iraq and Afghanistan are beginning to become clear as an inevitable, and intentional outcome of US strategic planning and technological change – processes admired by successive Australian governments. If these wars are regarded as strategically counter-productive, morally repugnant or legally criminal in their conduct by Australia and its allies, what should be done about the conditions under which Pine Gap is said to operate with the full knowledge and concurrence of the Australian government? The same moral and legal questions must be raised about the likely role of Pine Gap in the location of targets for extra-judicial killing

¹³⁸ Ball, “The strategic essence”, *op.cit.*, p. 242.

¹³⁹ In *Pine Gap* Ball briefly discussed the issue of limitations on then feasible satellite crosslinks of the Nd:YAG (neodymium-doped yttrium aluminum garnet) laser types on the DSP satellites, reporting that the CIA had concluded that requirements for volume, security and quality were then “beyond current and foreseeable technological developments”. Ball, *Pine Gap*, *op.cit.*, p. 92

by US drones in Pakistan and Yemen and elsewhere outside “war zones”?¹⁴⁰ With full knowledge and concordance comes responsibility to examine the ways on which Australia may itself be responsible for the actions of the surveillance networks of which it is increasingly and willingly a part. The question then becomes one of whether there are any effective conditions an Australian government can place on

6.3 Pine Gap: is there any alternative?

If it is reasonable to conclude that Pine Gap is still a priority nuclear target in the event of major war, then the contemporary adequacy of Ball’s calculus of the grand bargain calls for assessment: on the balance of benefits and disadvantages, Pine Gap should be retained because its arms control role is irreplaceable; and so whoever speaks for arms control has no alternative but to speak for Pine Gap. Leaving aside for this purpose Ball’s accounting of the negatives and the positives, the vital task is to focus on the claim of the unavoidable necessity of Pine Gap for arms control and disarmament, especially at a time when an American president’s statement of a goal of an ultimately nuclear-free world has reinvigorated calls for both disarmament and abolition. For both of these goals, reliable, robust and trusted means of verification are essential.

Ball spelled out his reluctant conclusion from two separate directions, one about the role of signals intelligence and the arms control process, and the other concerning the lack of any viable alternative location for the Pine Gap station outside the Australian continent. The first argument draws largely on a two-part argument advanced by Richelson to the effect that US willingness to engage in arms control and disarmament is dependent on technical intelligence from space-based systems. Firstly, Richelson argued, “distinctions between arms control monitoring and military intelligence are often arbitrary and misleading” because not only are these capacities referred to in bilateral arms control treaties as National Technical Means of Verification (NTMV) required to monitor weapons systems under arms control agreements for verification purposes, but they are also necessary for the US to know enough about weapons systems not covered by the agreements to know that the arms control agreements will not lead to a damaging outcome, and to judge what might safely be put on the table for the next round of discussions. Secondly, Richelson argued, technical intelligence systems are not developed for verification purposes, but for military intelligence on a range of specific matters which may then, on the basis of utility and experience, be applied to the arms control process.

“Verification technology’ is not developed after an agreement; rather, technical capabilities to some extent dictate the type of provisions that can be included in a treaty. Today’s espionage is tomorrow’s verification.”¹⁴¹

Intelligence and arms control verification

Imagery and signals intelligence systems of different kinds, but particularly space-based systems, have been at the core of bilateral arms control agreements between the United States and the Soviet Union/Russia for more than forty years, and came to form a vital

¹⁴⁰ Philip Alston, *Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions. Addendum: Study on targeted killings*. Human Rights Council, General Assembly, United Nations. A/HRC/14/24/Add.6 (28 May 2010).

¹⁴¹ Jeffrey Richelson, “Technical Collection and Arms Control”, in William C. Potter (ed.). *Verification and Arms Control*. (Lexington: Lexington Books, D.C. Heath, 1985), p. 205.

and rare cooperative element in the restraint of bilateral arms races. From early days, monitoring of signals intelligence was crucial in at least two respects, as seen in two 1970s treaties. The 1972 Anti-Ballistic Missile Treaty contained an acknowledgement of the role of NTMV in verification activities, and a pledge to not interfere with NTM, or conceal relevant forces in a manner that would vitiate verification. In particular signals intelligence capacities were required to confirm that testing of phased array radars in “ABM mode” banned by the treaty was not being carried out. Then the 1979 Strategic Arms Limitation Treaty (SALT II) placed limits on multiple warheads on intercontinental ballistic missiles, and on the development of certain new types of missiles. An important single source of information on both matters. was the transmission of information during missile tests. Without data collected by signals intelligence facilities, particularly space-based, verification of compliance on these two matters was impossible. The 1979 treaty banned, albeit imprecisely, deliberate denial of access to telemetry, for example by encryption.

By the time the Strategic Arms Reduction Treaty (START) was signed in 1991, the legitimation of NTMV, including space-based signals intelligence, had advanced considerably, and Article IX of the treaty stated that

“for the purpose of ensuring verification of compliance with the provisions of this Treaty, each Party shall use national technical means of verification at its disposal in a manner consistent with generally recognized principles of international law.”

The treaty went on to specify obligations to not interfere with NTMV or conceal relevant forces from NTMV in greater detail than before. Given the deep and complex cuts in strategic nuclear weapons involved in the treaty’s implementation, and the concern for missile characteristics including throw-weight, and the number of reentry vehicle releases, missile test telemetry became a matter of great importance to both sides. The treaty (Article X) specified that

“During each flight test of an ICBM or SLBM, the Party conducting the flight test shall make on-board technical measurements and shall broadcast all telemetric information obtained from such measurements.”

Activities that would impede the necessary full access to such telemetry including encryption or jamming were explicitly banned. Coming at the end of the tense New Cold War decade of the 1980s, confidence in verification capacities was politically vital on both sides.

“Most analysts agree that by monitoring missile flight tests and analyzing telemetric data, both parties to the treaty also acquired a better understanding of the capabilities of the other side’s missiles. This transparency may have eased suspicions and avoided “worst-case” assessments about weapons capabilities.”¹⁴²

The place of telemetry – and consequently, signals intelligence - was much reduced for the New START Treaty signed in 2010. Because the main focus is on reductions in the numbers of weapons systems – ICBMs, SLBMs, and strategic bombers – and does not involve limits on new weapons systems, telemetry was of much less importance for verification of compliance, which mainly relied on overhead imagery and onsite

¹⁴² Amy F. Woolf, [Monitoring and Verification in Arms Control](#), Congressional Research Service, R41201, (December 23, 2011), p. 13.

inspections. However, the treaty does contain provision for telemetry exchanges, principally for confidence building purposes.¹⁴³

As of 2012, Pine Gap's role in arms control treaty verification practices has diminished considerably from the preoccupations of the 1980s and the 1990s with missile telemetry. The US-Russia New START Treaty is primarily arms reduction treaty, and has resulted in very substantial reductions on both sides. However, this does not in itself mean that Pine Gap's signals intelligence arms control verification role is finished.

Firstly, it is possible that Russia or the US or both could recommence missile development, leading to a requirement for treaty-based constraint, including telemetry monitoring. Secondly, Pine Gap has for many years monitored telemetry from missile tests by other countries – including nuclear weapons states such as China, India, Pakistan, and North Korea. At some point, these states need to be brought into nuclear disarmament negotiations with arms control agreements, whether bilateral or multilateral, and in some cases confidence in verification will require effective signals intelligence monitoring of missile testing. Moreover, Pine Gap almost certainly also monitors missile testing by non-nuclear states including allies such as Japan and South Korea, as well as Iran. If further horizontal and vertical missile proliferation is to be curbed, monitoring of missile testing telemetry will also be required. Whether Pine Gap and the US systems of which it is a part will be legally involved at a treaty level is another matter, but in practical terms, the capacity to do so will be present, and the monitoring will take place in any case for US intelligence purposes.

However, it is clear that the role of space-based US signals intelligence in arms control treaty verification is not a constant matter. To that extent, Ball's assertion to the effect that "whoever says arms control, says Pine Gap" is not an ahistorical absolute, and will be less or more compelling depending on the global state of nuclear confrontation, proliferation, and arms control regimes. The historicity in turn changes the weighting of the balance of costs and benefits of Pine Gap (and once again, North West Cape) in the questions Ball set out in the 1970s, and which, as we have seen, need periodic reformulation and reassessment beyond acceptance of the maintenance of stable nuclear deterrence as conceived of in the 1980s.

Does the contribution of Pine Gap's signals intelligence arms control role to what Australian governments have conceived of as stable deterrence in the global nuclear balance still outweigh its role in nuclear war-fighting, and the contribution that its missile defence role makes to nuclear arms racing? To repeat, in this context, a question asked earlier, does hosting the Pine Gap facility have consequences for the likelihood of movement beyond the snail's pace of disarmament to which the world has become accustomed to enhancing movement towards the goal of nuclear abolition? At what point is any positive role for Pine Gap in arms control vitiated by the contribution it and other US intelligence and military facilities in Australia make to the dangers of US-China conventional confrontation, and with it, the danger of escalation to use of nuclear weapons?

¹⁴³ [New START Treaty and Telemetry](#), Bureau of Verification, Compliance, and Implementation, Department of State, Fact Sheet, (April 8, 2010).

Location requirements

Ball's second argument for the reluctant acceptance of the necessity of Pine Gap derives from technical reasons why the Pine Gap facility was located in Central Australia, and why no location outside Australia was acceptable to the United States. This concerns the security requirements to ensure that the massive amounts of data downlinked from the signals intelligence satellites in geosynchronous orbit to a ground receiving station are not intercepted by adversaries. For satellites positioned over the Indian Ocean or Southeast Asia, the downlink station needs to be located somewhere between about 50° longitude (the western Indian Ocean) to 180° (mid-Pacific). The size of the area that needs to be secured against adversary interception is, Ball wrote, a function of the transmission frequency and the diameter of the downlink antenna on the satellite. When the geosynchronous SIGINT satellite constellation was planned in the mid-1960s, these were about 24 GHz and 2.5 m. respectively, yielding a requirement of a secure area of about 160 km in diameter. Accordingly, downlinking to small islands such as Diego Garcia or Guam would have been too vulnerable to interception by Soviet SIGINT-equipped ships or aircraft, and crowded land areas in the Philippines or Japan unable to be protected against covert interception system in nearby areas.

Taking the technical argument first, Ball ruled out the obvious line of inquiry immediately: larger antenna size and higher frequencies “were simply not technical options”.¹⁴⁴ Unfortunately Ball gave no information as to exactly what these excluding technical factors were, so it is difficult to know the nature of the limits on frequency and antenna size he was including. Leaving the frequency band issue aside, there are in fact a range of electrical and physical issues affecting choice of antenna size and characteristics for downlink antennas from geosynchronous orbits, such as the accommodation constraints deriving from configuration of the satellite platform (especially when adjacent to receiving antennas more than 100m. in diameter, as well as antennas for the Telemetry, Tracking and Command subsystems, and optical crosslink to other satellites), radiated power and cross polarization discrimination requirements, and accommodation and deployment mechanism constraints from the fairing of the satellite launch vehicle, and others.

Moreover, there have been considerable advances in downlink antenna design for communications satellites in geosynchronous orbits in order to more precisely shape the size and configuration of the downlink footprint, including the use of mathematically adjusted surface profile shaping of the antenna. Certainly the payload size of signals intelligence satellites has increased considerably, as have the capacities of the launch vehicles. Yet until more is known about the actual characteristics of the current constellation of US signals intelligence satellites – concerning the variables Ball raised as definitive, as well as others – it is not possible to say more than that there are a wider range of technical issues that must be assessed, and that there is considerable urgency to do so. If there is a technically viable alternative location for the Pine Gap downlink facility, then that offers the Australian government and its people an alternative conclusion to Ball's painful acceptance of the balance of benefits and costs of hosting the facility. But it is still not possible to determine the answer to that question.

The arguments Ball adopted from Richelson have in certain respects become stronger over time, while in others less compelling. The primary verification function performed through Pine Gap's signals intelligence capacity has always been its original purpose:

¹⁴⁴ Ball, *Pine Gap, op.cit.*, p. 90.

intercepting telemetry from advanced missile testing in order to determine the characteristics and capacities of the missiles. As the number of countries with ballistic missile technology has expanded – well beyond the nuclear armed states – then so too has the need for telemetry interception, both for basic military intelligence purposes and for any serious attempt to regulate horizontal and vertical missile proliferation.

The quantitative and qualitative development of both the thermal signature detection and signals intelligence functions carried out through Pine Gap – and the wider systems into to which they are more closely integrated – undoubtedly bring greater space-based capabilities to the potential service of arms control and disarmament verification. At a time when the assurance such capabilities could bring to buttress disarmament momentum is this possibility is important if the thought of nuclear abolition is to have any plausibility. Difficulties in achieving the fundamental requirement of confidence-based verification for reliable detection of non-compliance and demonstration of compliance is amplified in the case of the security of space-assets by the highly hazardous nature of the space environment, where distinguishing between intentional damage and that caused by natural phenomena or accident is more difficult than in terrestrial environments; and where dual use technology is endemic, and similarly requiring a high-level of certainty as to the intention of its use.¹⁴⁵

Yet, the fundamental flaw in the argument remains reliance on, or acceptance of, the unilateral character of the verification capacities offered through these technical intelligence systems. At a very general level, put simply, but not necessarily simplistically, technical systems and capacities that give one side the confidence that measures of disarmament will not be disabling or worse should be available to the other side. In a fundamental sense, the sum of a situation where both sides have such capacities for assurance is greater than the parts. As Ushioda put it

“Verification is today largely unilateral and non-cooperative. Each state makes its own evaluations; it reacts to any breach of an agreement to which it is a party on the basis of its own interests. As a result, in the absence of a collective process, verification appears to be not a guarantee that the agreement will be implemented but a guarantee of the individual security of the parties.”¹⁴⁶

At the height of the Cold War there were proposals, originally from France, for the United Nations to develop an International Satellite Monitoring Agency (ISMA), resulting in a UN expert study, focusing on space-based imaging.¹⁴⁷ While that proposal died under the disdainful gorgon stare of the Cold War nuclear superpowers, it has returned in a number of different forms in the past two decades.¹⁴⁸ In some respects, the

¹⁴⁵ Richard A. Bruneau and Scott G. Lofquist-Morgan. “[Verification Models for Space Weapons Treaties: A Flexible, Layered Approach as a Negotiating Tool](#)”, in Building the Architecture for Sustainable Space Security. Geneva: United Nations Institute for Disarmament Research, UNIDIR/2006/17 (2006).

¹⁴⁶ Setsuko Ushioda. [Satellite-Based Multilateral Arms Control Verification Schemes and International Law](#). Dissertation, Institute of Air and Space Law, McGill University, Montreal. November 1992, pp. 303-304.

¹⁴⁷ Report of the Secretary-General, The Implications of Establishing an International Satellite Monitoring Agency, Department for Disarmament Affairs, United Nations, New York (1983).

¹⁴⁸ Ushioda, *op.cit.*; Bhupendra Jasani. “[International Satellite Monitoring Agency – Has the time come for its establishment?](#)” Proceedings of Workshop on Safeguards Perspectives for a Future Nuclear Environment, Cernobbio Villa Erba, Italy, 14-16 October 2003; Trevor Findlay. [A standing United Nations verification body: necessary and feasible](#). Compliance Chronicles 1 (December 2005); Walter A. Dorn. [The Case for a United Nations Verification Agency: Disarmament Under Effective International Control](#), Working Paper 26, Canadian Institute for International Peace and Security, (July 1990); and Office for Disarmament Affairs,

idea of an ISMA-like body with a dedicated space-based imaging capacity has been rendered at least partially redundant by advances in commercial space-based imaging, though this is not the case in relation to either real-time thermal signature detecting of missile launches and detonations or electronic intelligence (or space security verification issues).¹⁴⁹

Moreover, while such ideas were originally cautiously proposed in the hostile and indeed Manichean bipolarising world of the Cold War, logically the argument for multilateral verification structures is a great deal stronger in the nuclear multipolar world of today, where the majority of the nine nuclear armed states have either nuclear-armed intercontinental or medium-range ballistic missiles at their disposal. And from the wider view of space security where more than 50 countries have launched over a thousand satellites and other space assets, only a very small number of countries have the capacities to ascertain what is happening with these satellites, many of those countries would have little reason to be confident their interests would be pursued by the majors with impartiality and diligence.

The facilities at Pine Gap (and in the future at North West Cape), and the systems of which they are an integrated part, are tasked exactly to address such a situation. The question arises, then, if Pine Gap is uniquely required for unilateral American arms control and disarmament verification purposes, and if another location is at present technically not viable, are there ways in which particular, partial functions of the facility can be utilised for collective, multilateral arms control verification purposes, without diminishing genuine claims (as opposed to the knee-jerk variety) of US national security? What forms of provision of data could be considered, in relation to both real-time thermal signature detection of missile launches and detonations or electronic intelligence? Under what institutional, legal, and security conditions? With the current rapid pace of nuclear weapon proliferation, long range ballistic and cruise missile proliferation, and the competitive militarization of space, serious assertion of collective rights to verification assurance capacities is necessary, and must engage closely and imaginatively on an informed basis with national interest-based unilateral national technical means of verification. An Australian government committed to the goal of a nuclear-free world articulated by its ally should be considering the ways in which the American facilities it embraces so willingly could be enlisted in such a process.

Richelson and Ball specified that one condition for the maintenance of the UKUSA arrangement, in addition to “firm, effective and responsible governmental oversight and control”,

“is that the citizens of the five democracies be officially and fully apprised of the nature and operations of these agencies, and of the consequences (both beneficial and disadvantageous) of the international cooperative arrangements among them – to the extent permitted by the genuine requirements of national security.”¹⁵⁰

Verification in all its Aspects, including the role of the United Nations in the field of verification, (New York: United Nations, 2008).

¹⁴⁹ For one discussion of possibilities on the latter see Walter A. Dorn. [*Tools of the Trade? Monitoring and Surveillance Technologies in UN Peacekeeping*](#), Department of Peacekeeping Operations, United Nations., (September 2007).

¹⁵⁰ Richelson and Ball, *op.cit.*, p. 309.

There has been a little progress. In 2008 the National Reconnaissance Office acknowledged Pine Gap as a Mission Control Station, and subsequently the existence of the US SIGINT satellite systems. In 2010 the US and UK governments released redacted versions of series of UKUSA agreements for the period 1940-1955.¹⁵¹ Yet fundamentally we remain even further from the democratic condition Richelson and Ball sought than when it was suggested, but the task is all the more urgent.¹⁵¹

Moreover, what is true for the civil rights of citizens of the five UKUSA countries also holds true for citizens of the rest of world in a situation of globalised threat from the nuclear weapons systems to which Pine Gap contributes. The task is to discover ways in which these national technical means of verification can be brought, however partially, haltingly, and unwillingly, into the service of universal human security.

¹⁵¹ [“NRO Mission Ground Station Declassification "Questions and Answers"”, National Reconnaissance Office](#); Jeffrey T. Richelson, [“Out of the Black: The Declassification of the NRO”](#), National Security Archive Electronic Briefing Book No. 257, (18 September 2008); and *UKUSA Agreement Release 1940-1956*, National Security Agency, (24 June 2010).

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Attachment 1: Satellite antennas/radomes at Pine Gap, 2012

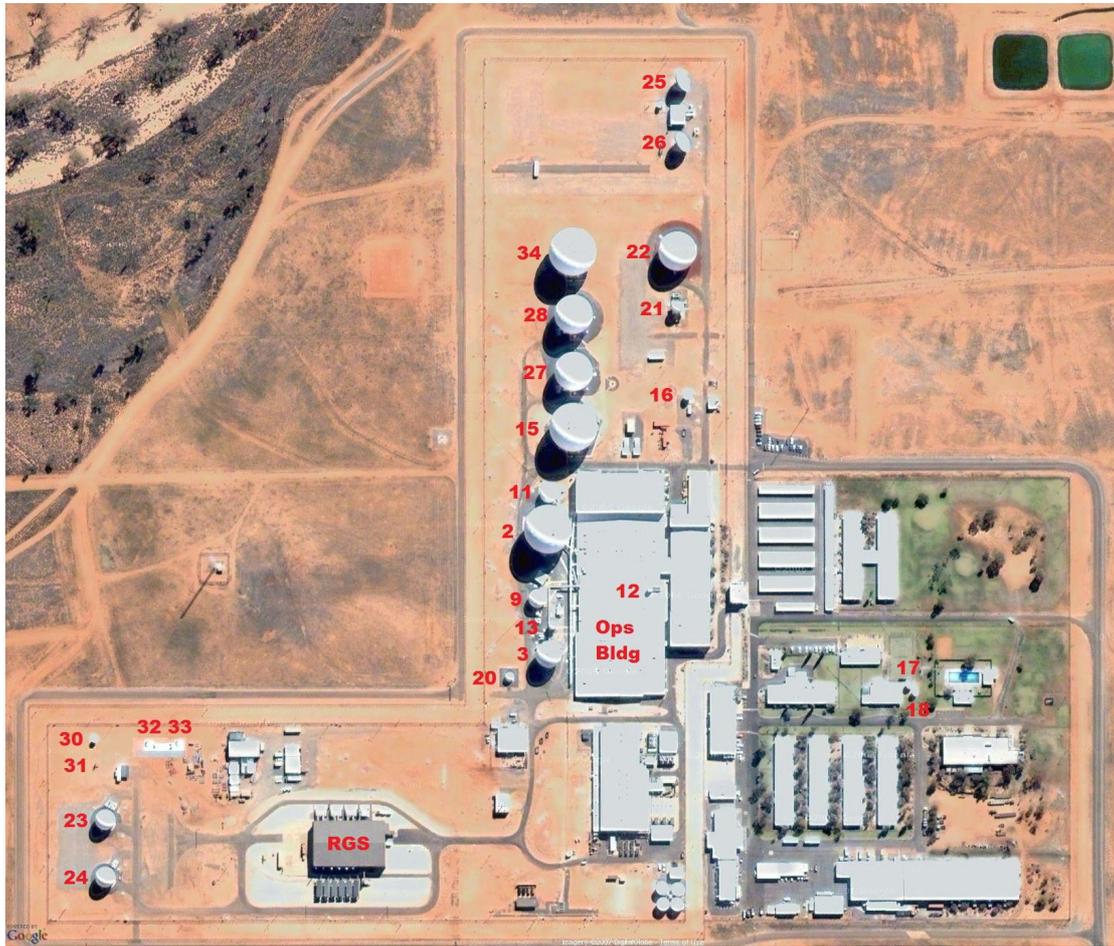
Table produced by Desmond Ball and Bill Robinson, 2007; updated by Richard Tanter and Bill Robinson, 2012.

No.	Size (ft.) antenna/ radome	Size (m.) antenna / radome	Built	Dismantled	Comments
1	?		1967		No radome
2	95-100/125	29- 30/38	1968		Radome replaced in 1977; #1 in Pine Gap (PG)
3	?/70	?/21	1968		Radome replaced in 1977; PG 2
4	?	?	1968		No radome
5	?	?	1968		No radome
6	?/60	?/18	1969	1973	Radome; "research" dish; replaced by #10 in 1973; IDSCS-related?; PG 3
7	?/15	?/4.5	1969	1980	Radome; upgraded to #13 in 1980; PG 4
8	?	?	1969		No radome
9	?/50	?/15	1971		Radome; no. 5 in PG 5
10	35/60	10.5/18	1973	1991-1994	Radome; SCT-35 DSCS dish; replaced #6; Ops Bldg addition built on site ~1998; PG 3
11	?/50	?/15	1977		Radome; PG 6
12	8/15	2.5/4.5	1980		Radome; SCT-8 DSCS dish; installed on roof of Ops Bldg; PG 7
13	?/25	?/7.5	1980		Radome; "upgrade" in size of #7
14	?	?	1984		No radome
15	95-100/125	29- 30/38	1985		Radome; PG 8
16	25/	7.5/	1986-1988		No radome; antennas without radomes were built in 1986 (1), 1987 (1), and 1988 (2)
17	18/	5.5/	1986-1988		No radome; S of tennis court; TV reception?
18	18/	5.5/	1986-1988		No radome; S of tennis court; TV reception?
19	?	?	1986-1988		No radome
20	?/25	?/7.5	1989		Radome; communications?
21	?/25	?/7.5	1990-1991		Radome; one of pair announced August 1990; communications?
22	?/100	?/30.5	1990-1991		Radome; one of pair announced August 1990
23	33/52	10/16	1998		DSP/SBIRS
24	33/52	10/16	1998		DSP/SBIRS
25	60/	18/	1999?		DSP/SBIRS; no radome; communications?

26	60/	18/	1999?	DSP/SBIRS; no radome; communications?
27	75/100	23/30.5	1999-2000?	Radome; one of pair built just N of dish 15
28	75/100	23/30.5	1999-2000?	Radome; one of pair built just N of dish 15
29	?	?	1999-2002?	No radome
30	16/	5/	2003-2004?	No radome
31	16/	5/	2003-2004?	No radome
32	?/17	?/5	2005-2007?	Radome; STSS-related?
33	?/17	?/5	2005-2007?	Radome; STSS-related?
34	95-100?/125	29- 30?/38	2011	Radome

Note: *Pine Gap (PG)*: Desmond Ball, *Pine Gap: Australia and the US Geostationary Signals Intelligence Satellite Program*, Sydney: Allen and Unwin Australia, 1988

Attachment 2: Pine Gap photo key, 2012



Source: Courtesy of Bill Robinson. (Google Earth)

Attachment 3. Pine Gap – antennas/domes, personnel and Australian budget: parliamentary sources

Date	Total number Of Dishes (number Of Radomes)	Facility total personnel	U.s. personnel	U.s. govt. Personnel	Australian personnel	Australian govt. Personnel	Annual australian costs (a\$) E.g 1967 = fy 1966/67	Source
1967							18,000	Killen to Scholes, 10.10.1978 ⁱ
1968	2		12		83		69,000	“
1969	4							
1970	5		256		184		127,000	“
1972			211		231		218,000	“
1974			226		206		352,000	“
1976			231		225		451,000	“
1977	6							
1978			228		226		633,000	“
1979	6 (6)							Killen to Scholes, 03.05.1979 ⁱⁱ
Early 1980s								Hawke, 22.11.1988 ⁱⁱⁱ
1988								(Hawke, 22.11.1988)
1989	18 (9)							Richardson to Dunn, 3.5.1989 ^{iv}
1990	9 [+ 2 to be constructed in 12-16 months]		320		343			Ray to Valentine, 17.05.1990
1994	13 (10)	725			405			Ray to Margetts, 19.09.1994 ^v
1999	18							
2002	26 (14)	876	428		448		FY 2001/02: \$8,402,000	Vale to Plibersck, 28.05.2002 ^{vi}
2005	29							
2008		800 approx	47%	18%	53%	12%	FY 2006–07: \$12 million approx; FY 2008–09: \$14 million approx.	Fitzgibbon to Melham, 16.06.2008 ^{vii}

ⁱ Killen to Scholes. Answers to Questions Upon Notice. *Defence-related Facilities: Foreign Involvement (Question No. 1253)*, House of Representatives, 10 October 1978.

ⁱⁱ Killen to Scholes, 1979. *Pine Gap and Nurrungar (Question No. 3596)*. Answers to Questions Upon Notice, House of Representatives, Hansard, *Commonwealth Parliamentary Debates*, 3 May 1979.

ⁱⁱⁱ *Joint Defence Facilities*, R.J.L.Hawke, Prime Minister, Ministerial Statement, House of Representatives, *Commonwealth Parliamentary Debates*, 22 November 1988. Hansard, House of Representatives, 22 November 1978, p. 2937.

^{iv} *Joint Defence Facilities: Radomes and Antennae*. Answers to Questions. Senate Hansard, *Commonwealth Parliamentary Debates*, 3 May 1989, p. 1742.

“At the Joint Defence Facility, Pine Gap, antennae with radomes were constructed in 1968 (2 antennae, both radomes being replaced in 1977), 1969 (2 antennae, 1 being upgraded in size in 1980), 1971, 1977, 1980, 1985 and 1989. The other antennae or satellite dishes without radomes were constructed in 1967, 1968 (2), 1969, 1984, 1986, 1987 and 1988 (2).”

^v *Defence: Pine Gap Facility*, Answers to Questions. Question no., Senate Hansard, *Commonwealth Parliamentary Debates*, 19 September, 1994, p. 95

^{vi} *Defence: Pine Gap*. Answers to Questions. Question no. 286. House of Representatives Hansard, *Commonwealth Parliamentary Debates*, 28 May 2002, p. 2555.

^{vii} *Joint Defence Facility Pine Gap*. Answers to Questions. Question no. 100, House of Representatives Hansard, *Commonwealth Parliamentary Debates*, 16 June 2008.