HIDING FROM THE LIGHT: THE ESTABLISHMENT OF THE JOINT AUSTRALIA-UNITED STATES RELAY GROUND STATION AT PINE GAP

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I. INTRODUCTION

In this essay, the author discusses recently released Australian cabinet papers dealing with a decision in September 1997 to allow the establishment of a Joint Australia-United States Relay Ground Station at Pine Gap to support two United States early warning satellite systems in place of its predecessor, the Joint Space Communications Facility at Nurrungar. The cabinet papers give a picture, albeit one muddied by censorship, of the Howard government's consideration of 'a U.S. request to continue Australian involvement in a U.S. space technological system to provide the U.S. with not only early warning of missile attack as a basis of nuclear deterrence, but also the capacity to target a retaliatory nuclear strike in the most effective way as part of a nuclear war-fighting capability. There is little evidence in these documents that senior ministers and their advisors considered these matters with any seriousness.'

The report is also published as a PDF file (1MB) here.

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Cover Image: The Relay Ground Station, Pine Gap, near Alice Springs, Australia, courtesy of Felicity Ruby

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II. NAPSNET POLICY FORUM BY RICHARD TANTER

HIDING FROM THE LIGHT: THE ESTABLISHMENT OF THE JOINT AUSTRALIA-UNITED STATES RELAY GROUND STATION AT PINE GAP

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On January 1, 2019, the National Archives of Australia published a set of heavily redacted Commonwealth cabinet papers dealing with a decision by the National Security Committee of the Howard coalition government in September 1997 to allow the establishment of a Joint Australia-United States Relay Ground Station (RGS) at Pine Gap to support two United States early warning satellite systems in place of its predecessor, the Joint Space Communications Facility at Nurrungar.[1]

The publication of the 1997 cabinet papers about the establishment of the Relay Ground Station comes at perhaps the most critical juncture in global nuclear politics in the post-Cold War era. On the one hand, the 2017 Treaty on the Abolition of Nuclear Weapons is progressing towards entry

into force. On the other hand, this historic step towards legal prohibition of nuclear weapons has been accompanied by intimations of renewed moves towards nuclear breakout in South Korea, Japan, and Germany, and elsewhere. In Australia, itself, there has been repeated advocacy of the country adopting nuclear weapons by high profile senior former security officials.[2]

In themselves, the 1997 cabinet papers give a picture, albeit one muddied by censorship, of the concerns of the newly elected Howard government about the most important nuclear weapon-related U.S. facility in Australia – then, and still today. A few years after fall of the Berlin Wall, the Howard government had the opportunity to review and consider a U.S. request to continue Australian involvement in a U.S. space technological system to provide the U.S. with not only early warning of missile attack as a basis of nuclear deterrence, but also the capacity to target a retaliatory nuclear strike in the most effective way as part of a nuclear war-fighting capability. There is little evidence in these documents that senior ministers and their advisors considered these matters with any seriousness.

The papers also provide an instance of the limitations and deficiencies of Australian government procedure in foreign affairs and defence decision-making. In Australian government procedure in general, the whole of the cabinet decides on major matters, and takes collective responsibility for the consequences. That notion of cabinet debate and collective responsibility, albeit somewhat diminished in practice, presumes that all cabinet members have access to the full facts of the matter at hand, to enable the government to say to the Australian populace that this matter was considered in full knowledge of this rationale of the decision and its consequences.

This was far from the case in the1997 Relay Ground Station decision. In May 1996, the Howard government decided that matters of defence, foreign affairs and security were to be decided by a small group of senior ministers, assisted by senior advisors (unlike Cabinet itself), making up the National Security Committee of cabinet. The full cabinet was then merely informed of the committee's decision.[3]

Reading the redacted cabinet papers brings to mind the long history of Defence Department evasions and misrepresentations of the facts and consequences of hosting what are elements of globally distributed U.S. military and intelligence systems. Either by an extraordinary omission in the original explanation to cabinet or through wholly unjustifiable contemporary redaction, the full suite of roles of the new Pine Gap system in both nuclear deterrence and nuclear war fighting, and consequently, its status as nuclear target, remains unacknowledged by the Australian government six decades after the establishment of Nurrungar.

From Nurrungar to the Relay Ground Station

On 23 April 1969, Prime Minister John Gorton announced to Parliament that Australia agreed to a U.S. request to host a Joint Defence Space Communications Station (JDSCS) at Nurrungar near Woomera in South Australia. The base's actual role as a ground control and communication station for the Defense Support Program (DSP) infrared early warning satellites was disclosed to neither the Australian parliament or public. According to the US Air Force official history, this was at the instigation of the Australian government to avoid public debate.[4] The station became operational with launch of the first successful DSP launch in May 1971.

The United States had given notice in 1993 that it was closing the base, declaring Nurrungar, then called the Joint Defence Facility – Nurrungar (JDF-N), technically obsolete. In 1995, the United States requested permission to build and operate a much smaller station at the edge of the Joint Defence Facility Pine Gap. The new facility would support existing DSP satellites over the Indian Ocean and the Pacific Ocean, and would in time support the planned successor generation of early

warning satellites known as the Space-Based Infra Red System (SBIRS). The Nurrungar station was subsequently closed, and the RGS at Pine Gap became operational in 2000.

Figure 1. Joint Defence Facility – Nurrungar by night, 1999

Source: (T-Sergeant) Chird Bobbitt, 'Nurrungar by night', *Bobbittville*, at http://www.bobbittville.com/Nurrungar-byNight1999.jpg

The documents released in January 2019 consisted of a brief Cabinet Minute from the National Security Committee, a lengthy submission to the committee from the Minister of Defence, Ian McLachlan, including an Executive Summary and four attachments, and a 2019 statement of reasons for redactions authorised under the *Archives Act (1983), Section 40(5)*.

Redactions amounted to more than a third of the length of the ministerial submission alone. Every page of the cabinet minute and the ministerial submission contains redactions, and one of the attachments, titled 'SBIRS Data', is wholly redacted.

According to the 'decision maker' authorizing the 2019 redactions, public disclosure of the censored portions

> 'could reasonably be expected to compromise current or future Defence operational procedures, thus jeopardizing Australia and her allies/success in Defence operations.'[5]

As will become evident, in virtually every case, this censorship was either unwarranted or implausible in its claims.

Today the Relay Ground Station at Pine Gap consists mainly of four large antennas in radomes and three small ones occupying a compound on the western side of the JDFPG, about 250 metres west of the more numerous antennas dedicated to Pine Gap's principal role of collecting signals intelligence.[6] In addition, two large communications antennas and several smaller antennas dedicated to transmission of the DSP and SBIRS satellite data to the United States are located in the northeast corner of the main compound.[7] The two main communications antennas provide a link to

the SBIRS Mission Control Station (MCS) at Buckley Air Force Base (AFB), near Denver, Colorado, and to the Mission Control Station Backup (MCSB) at Schriever AFB near Colorado Springs, and to mobile ground stations.[8] After processing at Buckley, some data is relayed back to Australia: to HMAS Harman in Canberra, to the Defence Department at Russell Hill, to the Headquarters Joint Operations Command [HQJOC] at Bungendore, and to No. 1 Remote Sensor Unit (1RSU) at RAAF Base Edinburgh north of Adelaide. 1 RSU operates an Australian Mission Processor at Edinburgh to generate intelligence derived from the DSP and SBIRS satellite data applied to Australian security needs.

The DSP ground segment consisted until 1999-2000 of three permanent ground stations: the Overseas Ground Station (OGS) at Nurrungar, the Continental U.S. Ground Station (CGS) at Buckley AFB, the European Ground Station (EGS) at Kapaun, Germany, each dealing with 'its' satellites. All three were stand-alone facilities:

'The primary mission of the OGS was to process data from DSP satellites over the eastern hemisphere - data concerning the satellites' mission, health, and status-and to provide reports to the National Command Authority.'[9]

Figure 2. The Relay Ground Station compound, Pine Gap (December 2014) (from left to right, Antennas 05-B, 12-A, 05-A, 13-A, 98-A, 98-B and 13-B)

Source: Kristian Laemmle-Ruff, (Attribution - NonCommercial CC BY-NC).

By the end of 2001, the European and Australian ground stations were scheduled to be closed, and replaced by Relay Ground Stations at Pine Gap and Menwith Hill in the UK. In addition to the ground stations DSP satellites could also downlink to mobile ground terminals, designed to provide redundancy in the event the destruction of the fixed ground stations. Furthermore, Army and Navy Army and Navy Joint Tactical Ground Stations (JTAGS) had become operational in 1997, providing tactical intelligence directly from the DSP satellites to U.S. combatant commands. Beginning in 1995, dissemination of warning of missile attacks in regional theatres had begun through the establishment of a fourth ground station at Schriever AFB in Colorado: the Attack and Launch Early Reporting to Theater (ALERT) system which fused data from the whole constellation of DSP satellites and other sources to provide 'extremely rapid missile warning' to theatre commanders.[10]

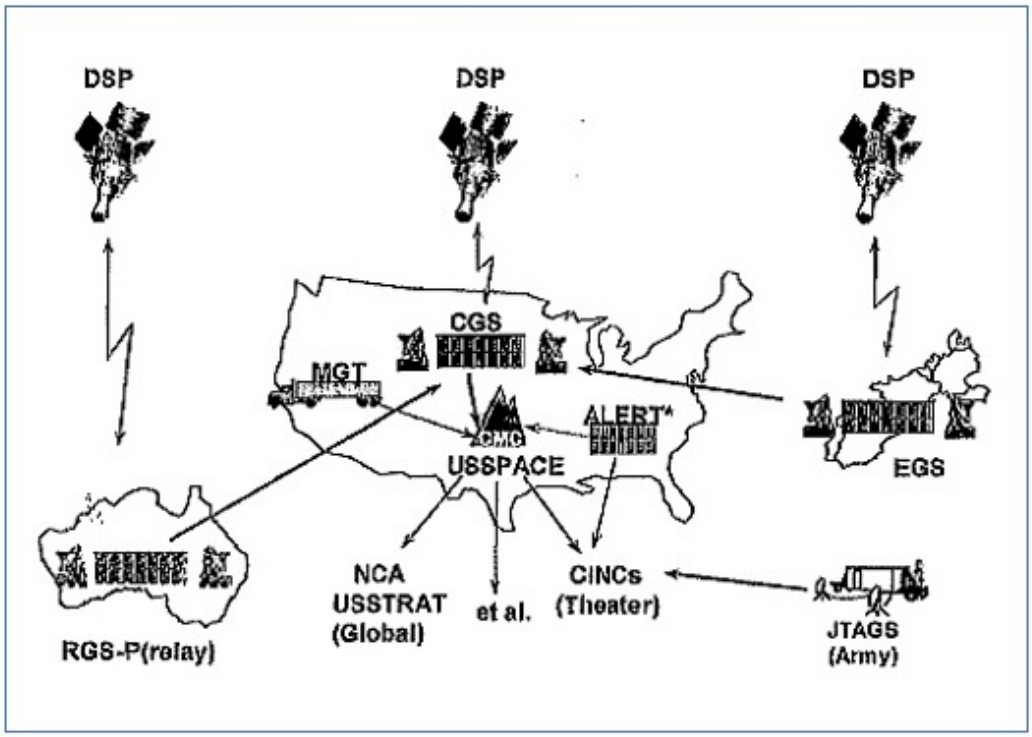
The cabinet committee's concurrence with the defence minister's recommendation to proceed with the U.S. request was based, firstly, on 'the understanding that arrangements have been agreed that would':

1. 'allow Australia to exploit the capabilities of the system to address Australian Defence Force (ADF) interests;
2. 'enable Australia to make a contribution to performance of the system's missions; and
3. 'through the conditions set out in sub-paragraph (a) and (b) above, ensure that Australia has full

knowledge and concurrence of the operations of the Relay Ground Station and the wider system it supports.' (§1)

Figure 3. DSP system architecture c. 2000

ALERT: Attack and Launch Body Reporting to Theater (Schriever AFB)
CGS: Continental Ground Station, (Buckley AFB)
CMC: Cheyenne Mountain Complex / US Space Command
EGS: European Ground Station (Kapaun, Germany)
JTAGS: Joint Tactical Ground Station
MGT: Mobile Ground Terminal
NCA: National Command Authority / USSTRAT: U.S. Strategic Command (Global);
RGS-P: Relay Ground Station – Pacific (Pine Gap)



Source: Space and Missile Systems Center History Office, *History of the Space and Missile Systems Center, 1 October 1998 – 30 September 2001, Volume I*, p.189; reproduced in Jeffrey T. Richelson (ed.), *Space-Based Early Warning: From MIDAS to DSP to SBIRS*, National Security Archive Electronic Briefing Book No. 235 (Updated 8 January 2013), at https://nsarchive2.gwu.edu/NSAEBB/NSAEBB235/20130108.html.

1. 'allow Australia to exploit the capabilities of the system to address Australian Defence Force (ADF) interests;
2. 'enable Australia to make a contribution to performance of the system's missions; and
3. 'through the conditions set out in sub-paragraph (a) and (b) above, ensure that Australia has full knowledge and concurrence of the operations of the Relay Ground Station and the wider system it supports.' (§1)

The committee's second major comment (§2) was wholly redacted.

The committee's final comment (§3) stated that

- an Implementing Arrangement to give effect to the first two recommendations would be concluded before the base became operational (§3(a));
- the closure of Nurrungar and the withdrawal of the USAF from Woomera would be jointly managed in compliance with heritage, environmental and native title regulations (§3(c));
- the future of Woomera as a viable community after the closure of the joint facility remains in doubt' (§3(d)); and that
- 'Australians would be posted to work in the central mission control station in the United States' (§3(e)).

One element of the cabinet committee's statement of approval was deleted entirely ((§3(b)).

The Ministerial Submission

The ministerial submission noted that the previous Keating government had approved the establishment of the Relay Ground Station in principle in 1995, and that the Howard government had confirmed this support to the US in July 1996 (§2). It went on to recognize that the RGS 'should be regarded as a new joint facility that we will host for many years'. (§5)

The bulk of the remainder of the submission dealt with 'Issues', including Functions of the RGS, Full Knowledge and Concurrence, Defence and Foreign Policy – Other Considerations, Sensitivity/Criticism, Public Information, and Financial Considerations. The first two 'issues', which the ministerial submission recognized as being critical to the legitimacy of the RGS in the eyes of the Australian public, were the areas of greatest concern.

Reflecting on 'our experience at JDF-N and Joint Defence Facility Pine Gap', the submission went on to outline 'two fundamental considerations in evaluating the US proposal':

> 'First, whether the functions of which the RGS will be a part can be expected to be closely coincident with Australian interests.
>
> Second, whether arrangements can be devised, such that, through Australian involvement in the operation and management of the facility, the Government has effective full knowledge and concurrence of these functions.' (§5)

Concern to address these two core matters affecting the future legitimacy of the base derived from criticisms that had arisen over the previous two decades, and which fed into a mass peace movement in the first half of the 1980s that placed considerable pressure on the later Fraser and later Hawke governments. This had followed publication of well-sourced detailed information about the roles of both Nurrungar and Pine Gap from researchers and journalists that was both sharply critical of the Australian government's consistent pattern of misrepresentation about the bases' activities and the risks of hosting them.[11]

A constrained account of the 'Functions of RGS'

Of five paragraphs (§6-10) under the heading of 'Functions of the RGS', three were redacted in their entirety, and the other two substantially, leaving just one-third of the text legible. Yet either by pointless and unjustifiable contemporary redaction or by omission from the original text, two key functions of the DSP system and the RGS appear to be absent, constituting seriously irresponsible misrepresentation to cabinet.

The first, and most intact, paragraph in this section (§6) provided an account of the original function

for which the DSP satellites were first designed in the 1960s: 'the early detection of the launch of large intercontinental ballistic missiles'. This capability, the submission averred, supported 'the stability of the strategic nuclear balance in two ways', through each of which Nurrungar 'made an important contribution to the avoidance of a nuclear war, a compelling Australian interest'.

In explanation, after a short redacted clause, the submission stated that the DSP system

contributed greatly to the goal of strategic nuclear stability. Firstly, early warning of an incoming nuclear strike would make possible 'the launch of a retaliatory strike before warheads struck their targets in the US', thus deterring a surprise first strike against the United States. Secondly, 'the DSP satellites complemented other systems [line redacted][12] to give the US greater certainty that a nuclear attack was indeed underway', providing stability by avoiding nuclear retaliation to 'a phantom attack'.

The long paragraph (§7) that followed is redacted in its entirety.

Paragraph 8 begins by attributing the endurance and depth of the alliance to shared values and 'very similar basic views on challenges to the stability of the international system'. However, the remainder of that paragraph is redacted, as are all of both paragraph 9 and the longest of the section, paragraph 10.

It of course difficult to infer or judge what was contained in the redacted two-thirds of this explanation to cabinet discussion of the functions of the Pine Gap Relay Ground Station for the DSP and SBIRS satellites. However, two striking absences from the declassified version of this section of the Defence Minister's submission to cabinet are evident - either by redaction in 2019 or by omission in the 1997 original.

Firstly, there appears to be no reference to functions provided by the capabilities of the DSP satellites other than those of early warning of surprise missile attack and equally importantly reducing the likelihood of a nuclear retaliation to a phantom attack. In particular, the extant text of the 1997 submission appears to ignore the critical role of the DSP satellites, and hence the RGS, in U.S. plans for nuclear war fighting.

Almost a decade earlier, Desmond Ball had outlined capabilities of the DSP satellites that took them far beyond the early warning function that an attack is underway essential to the basic idea of nuclear deterrence. Ball argued that the DSP satellites support nuclear war-fighting strategies in at least three ways:

- enabling second-strike nuclear targeting;
- facilitating assessment and characterization of the scale and purpose of a Soviet nuclear attack; and
- assessment of the impact of US nuclear strikes on Soviet territory. [13]

To take just the first of these capabilities, the DSP satellites not only provided the U.S. with warning of missile launches against the United States, but also identified the locations of land-based intercontinental ballistic missile launch sites with sufficient accuracy to enable US planners to ascertain the specific silos that had launched attacks – and which not:

'The policy of being able to engage in sequential counterforce strategies, or to "fight and win" a nuclear war, requires precisely this ability to determine which specific Soviet ICBM silos have been used so that the United States can then re-target its own ICBM warheads away from the empty holes

to the remaining Soviet ICBMs, and can then direct other US ICBMs to those ocean areas from which Soviet Submarine Launched Ballistic Missile launches have been detected.'[14]

As Ball put it, the DSP system, including the Australian ground station controlling and communicating with the DSP satellites surveilling the Soviet Union (and China) 'enhances war-fighting capabilities in several important ways, some of which are critical to the success of *any* war-fighting strategy.' [15] These were not matters hidden from the Australian government, but were evident to anyone who cared to look at public statements of US senior military and defence officials.

Figure 4. Defense Satellite Program Flight 16 (DSP-16) deploying from Space Shuttle mission Atlantis STS-44, launched 24 November 1991

Note: DSP components include Infrared (IR) sensor (top), AR I (Advanced RADEC [Radiation Detector] I), SHF Antenna, EHF Antenna, Link 2 High-Gain Antenna, star sensor, and stowed solar paddles (box-like structure around the base).

Source: 'STS-44', *NASA on The Commons*, Flickr, Image #: S44-71-011, Date: November 24, 1991, at https://www.flickr.com/photos/nasacommons/25389490999.

Secondly, either by omission in the original 1997 text or by contemporary redaction, there appears to be no reference to the probability, recognised by the preceding Hawke and Keating governments, that under certain foreseeable circumstances, Nurrungar, and most likely the planned DSP/SBIRS Relay Ground Station at Pine Gap, would be high priority targets for nuclear attack.[16]

Because of the dependence of the United States on the capabilities of the DSP satellites for both nuclear deterrence and nuclear war-fighting Ball noted,

> 'Soviet targeting doctrine is known to accord strategic early warning and associated command and control systems the highest priority'.[17]

Moreover, Ball also pointed out, while Australian officials 'are prone to dismiss this possibility', U. S. strategic planners have noted that 'there are also some conceivable situations which are short of an attack against the United States but in which the Soviet Union might attack the DSP station at Nurrungar.'[18]

The apparent absence of discussion of the likelihood of nuclear attack on Nurrungar – and very likely the RGS as well – in the 1997 cabinet submission would have been a dereliction of ministerial responsibility. Not only had Ball and other researchers documented such a possibility, but over the preceding decade senior Australian leaders had acknowledged exactly these possibilities repeatedly by public statements.

In his major statement to parliament on the 'joint facilities' on 6 June 1984, Prime Minister Bob Hawke acknowledged that 'the Government believes that hosting the facilities does bring with it some degree of added risk of nuclear attack'. The following month Foreign Minister Bill Hayden confirmed government awareness that 'it is undeniable that in certain circumstances these facilities [Pine Gap, Nurrungar, and North West Cape] could be nuclear targets.' [19] Two years later, on 16 March 1986, Hayden went further still, saying

> 'They are … nuclear targets in certain circumstances, I would think high priority ones in an all-out exchange.' [20]

And just one month before the September 1997 cabinet decision, the former Labor Minister for Defence Kim Beazley told the Joint Standing Committee on Foreign Affairs, Defence and Trade that in his time in government that had just ended

> '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.'[21]

Clearly, such issues such as the role of Nurrungar and the Relay Ground Station in nuclear war-fighting and their status as candidate high priority nuclear targets should have been addressed in the ministerial submission's discussion of 'whether the functions of which the RGS will be a part can be expected to be closely coincident with Australian interests'.

Faced with the redactions in the 2019 declassified publication, we do not know whether cabinet was willfully misinformed by the omission of such matters, or whether there was some such reference that was censored in the 2019 publication. The first would be a matter of abandonment of responsibility and the second wholly unjustifiable.

Omission of these matters in the original text would have been another instance of successive Australian governments ignoring the complexities of the military technologies and systems to which they were committing this country. In viewing the joint facilities in unambiguously positive terms and avoiding recognition and assessment of the inherent risks and negative aspects, the cabinet would have been neglecting its responsibility to present the Australian people with an honest and balanced representation of the security benefits and existential risks of hosting the bases.

Justification of the alternative possibility – that such discussion in the 1997 cabinet document was redacted for publication in 2019 – must rest on a claim, through application of the *Archives Act*, that

the document contains information of ‘continuing sensitivity to defence plans, operations or capabilities’ that publication of which could

> ‘reasonably be expected to cause damage to the security, defence or international relations of the Commonwealth’,

resulting in a situation that

> 'could reasonably be expected to compromise current or future Defence operational procedures, thus jeopardizing Australia and her allies/ success in Defence operations.’[22]

So much has been redacted from this part of the document that there is much about which we cannot be certain, but it is clear from the unredacted portions that discussion of what the DSP and SBIRS satellites were or would be capable of is at such a level of generality that it is highly unlikely that publication of the apparently omitted functions could ‘compromise current or future Defence operational procedures’. Since the 1997 Australian cabinet submission there have been dozens of books, and hundreds of policy papers, technical reports, progress assessments, and strategic analyses by both government and non-government sources in the United States alone discussing what would once have been considered highly sensitive commentary on the DSP and SBIRS satellites, starting with Jeffrey Richelson’s classic history, *America’s Space Sentinels: DSP Satellites and National Security* published in 1999.

Very likely, some part of this section discussed – at least briefly – the planned capabilities of the SBIRS satellites, which were intended to be considerably greater than their DSP predecessors. If so, the extent of such redaction is surprising, because for many years before 1997, there had been widespread, protracted and heated discussion in the United States about the requirements of a successor to the DSP system. Moreover, official US public documents in the years before the cabinet discussion made clear that the capabilities of the SBIRS satellites would go well beyond those of even the later versions of the DSP satellites, to provide applications not only for enhanced early warning of missile attack, but also for

> ‘missile defence (by providing information to defensive systems) technical intelligence (including threat performance and target signature data), and “battlefield characterization”’.[23]

In 2019 it would be very difficult for an informed reader of such publicly available material to imagine that these redacted portions of the cabinet submission’s very general discussion of the functions of the Pine Gap Relay Ground Station could contain anything significant to compromise contemporary Australian defence operations – although there may well be matters that would embarrass those in the Howard government’s National Security Committee, and their advisors, that accepted the RGS proposal on the basis of apparently misleading and flimsy documentation.

Unwarranted confidence in ‘Full Knowledge and Concurrence’

The most politically difficult problem the ministerial submission sought to address was the threat posed by strong and widespread public concern about the existing joint bases, which were likely to be transferred to the new facility. The solution was sought in the phrase ‘Full Knowledge and Concurrence’, introduced by the Hawke government in 1988 to counter years of public concerns about a loss of sovereignty resulting from hosting US intelligence facilities.

The political unease of the five paragraphs under the heading of ‘Full Knowledge and Concurrence’ was clear from their first sentences dealing with the way in which applying the earlier lessons of

framing the legitimacy of Pine Gap and Nurrungar might not be perfectly applicable to the RGS:

'The capacity to assert confidently that Australia has full knowledge and concurrence in the activities of the Joint Defence Facilities is important from the standpoint of sovereignty, and has been central in building strong public support for the Facilities. [Sentence redacted] This factor underscores the importance of full knowledge and concurrence of the mission or missions performed by the facility'. (§11)

Until the closure of Nurrungar the Australian government's claimed confidence to assert full knowledge and concurrence with operations at both Nurrungar and Pine Gap rested on 'prior agreement on the missions' of the facilities, and on four aspects of the reforms at Nurrungar achieved by the Hawke and Keating governments:

- Roughly equal numbers of Australian and U.S. personnel[24]
- The appointment of an Australian Deputy Chief of Facility with command responsibility for the station in the absence of the US Air Force Chief of Facility.[25]
- Australians filling at least two of the four crew commander positions.[26]
- Full participation by Australian personnel 'in all aspects of the operations of the facilities, including tasking of them, to provide information in Australia's particular security interests.'[27]

According to a 1991 parliamentary committee Nurrungar was staffed at the time with personnel from the US Air Force, the US Navy, the Australian Navy, Army and Air Force, and a joint venture of AWA and Serco. In practice from beginning the nominally joint station was fundamentally a US Air Force facility operated by the 5th Defense Communications Squadron of the 1st Space Wing, of Space Command Headquarters (later reconstituted as the 5th Space Warning Squadron (5SWS) in 1992).[28]

Figure 5. USAF 5th Space Warning Squadron badge

Source: '5th Space Warning Squadron', *USAF Orders of Battle*, at http://www.usafunithistory.com/PDF/5-9/5%20SPACE%20WARNING%20SQ.pdf.

What 'Full Knowledge and Concurrence' actually amounted to – in 1997, and subsequently – is a matter of debate, but one summary of the position by an experienced observer after attempts at explication by several successive Labor defence ministers is probably generally accepted, and is salient to the submission's approach to the problem of legitimating the Relay Ground Station:

> ‘Australia must concur to the function and operation of the facility but does not have control over individual US taskings: Broad concurrence, yes. Individual veto, no.’[29]

The ministerial submission recognized that the Relay Ground Station would pose difficulties for the existing approach to exercising full knowledge and control based on the kind of ‘direct Australian involvement’ that had been achieved at Pine Gap and Nurrungar. This situation derived from the fundamentally different technical character of the RGS compared to the very large stand-alone DSP command, control and data processing and analysis facility at Nurrungar. The Joint Defence Facility – Nurrungar employed almost 500 people at its height, and rivalled Pine Gap in size and complexity. The two buildings adjacent to the two large radomes housed a Satellite Readout Station, a Data Reduction Center, and a Tactical Operations Room, the last of which controlled and managed the DSP satellite over the Indian Ocean.[30]

The Relay Ground Station was to be simply a relay facility, operated automatically and remotely from the United States. There would be few Australians or Americans on site at the RGS, and they would have no substantive operational role. There would be no processing or analysis at the RGS of the data that would flow through it untouched to Buckley AFB. Effective Australian oversight of the DSP and SBIRS missions on site at Pine Gap would simply be impossible. This situation, the submission conceded, ‘would require different arrangements.’ (§12)

Optimistically, the submission argued, the Australian government could achieve full knowledge and concurrence with the DSP and SBIRS systems’ missions through the new facility by making ‘the largest possible contribution to the mission of the facility’ in five ways, all of which were to be reflected in the Implementing Arrangements (§13):

1. ‘agreement on the missions to which the data passing through the RGS will contribute’, with consultations over new missions, and ‘annual reviews of the operation of the system of which the RGS is a part’;
2. ‘the ability to have direct access to the data passing through the RGS; full Australian access, in real time, to the event reporting produced by the central processing facility in the US’;
3. ‘an Australian capacity to contribute to the tasking of the DSP/SBIRS system’;
4. involvement of Australian personnel in the team monitoring the operation of the RGS at Pine Gap’; and
5. stationing ‘Australians in the United States to work in the central Mission Control Station’. (§13)

The last measure, embedding Australians at Buckley AFB, the submission argued, would remedy the otherwise inherent absence at the RGS of ‘the quality of partnership and interaction which we have achieved at the Joint Defence Facilities’. (§14)

In fact, the submission’s case for confidence in its model of Full Knowledge and Concurrence for the Relay Ground Station was largely a matter of making the best of an inherently difficult situation. Each of the five elements proffered as a foundation for the legitimacy of the RGS fell short:

1. Agreement on the mission of the DSP/SBIRS systems was confined to the publicly acknowledged high-level general goals of contributing to stable deterrence through nuclear early warning and avoidance of false alarms, but showed no evidence of recognition of an Australian role in nuclear strike targeting, let alone consideration of the consideration of the consequences of such a goal.
2. Having direct access to the data passing through the RGS and the analysis produced by it may have been a desirable goal for Australian defence purposes, but in itself would not give Australia

the capacity to intervene in that flow in the event of serious disapproval of a particular application.

3. Similarly, a capacity to contribute to DSP and SBIRS systems tasking might have utility for Australia's specific interests, but no mechanism appeared to provide a capacity to substantially affect that tasking process.
4. Involvement of Australians in the team monitoring the operation of the RGS on the ground at Pine Gap would be essentially a matter of monitoring the mechanical and electronic health and physical reliability of the RGS itself.
5. As the 1997 submission had proposed, ADF personnel have been deployed to the Mission Control Station on rotation at Buckley AFB in the US Air Force's 2nd Space Warning Squadron (2SWS) since for more than a decade. Usually a cohort of about three RAAF corporals or sergeants and a flight lieutenant have trained through 2SWS and then served as Mission Crew Chiefs in the MCS.[31] However, valuable as this training and experience may have been for their subsequent careers in the RAAF, their junior roles have not been at a level to ensure the submission's sought-after 'quality of partnership and interaction', or to make any significant contribution to the task of validating 'broad concurrence' with the Australian government's understanding of what it had signed up to, let alone raising concerns that might lead to thoughts of considering a veto.

The question of the efficacy of the planned arrangements to assure legitimacy for the RGS and potential diminution – or violation – of Australian sovereignty was raised with admirable clarity by the defence analyst Stephan Fruhling in his 2003 study on Ballistic Missile Defence for Australia. Noting the role of the RGS in U.S. ballistic missile defence, Fruhling recommended consideration of the issue of 'whether and how far Australia should sacrifice its sovereignty rights for such cooperation [with the U.S. over BMD].' Fruhling's answer was a somewhat brutal but accurate realist's assessment that one would have hoped to have heard discussed in the National Security Committee, from the attendant advisors, if not from the politicians:

'The RGS will soon be part of a US combat system which will, sooner or later be involved in combat operations against a third country, possibly in a conflict to which Australia is not directly a party. Since Australia taps into the SBIRS data flow at Pine Gap (and has personnel stationed in Colorado who analyse data relevant to Australia), it could be argued that the system is at least partly "Australian owned". Yet, as the North West Cape communications station during the Cold War showed, such a fiction is difficult to maintain in many cases. It might become much more of a problem today since the likelihood of BMD being used is arguably much greater than a use of the North West Cape Station ever was.'[32]

Overall, the submission, at least as published in 2019, provides few grounds for accepting the ministerial submission's claim, repeated subsequently, that an Australian government would be in a position to assure the Australian public that arrangements for oversight of the Relay Ground Station could properly address the consequences of hosting the facility, including the possibility of drawing Australia into culpability for assisting with not only the use of nuclear weapons for deterrence, but also for nuclear war-fighting.

Pointless redactions of known history

A final, heavily redacted paragraph (§15) commented on the potential Australian access to data passing through the RGS proposed in §13(b):

> 'Access to the raw data derived from the RGS is potentially of interest to Australia's security interests.'

However, the submission averred,

> '… the extent to which we will wish to exercise this option cannot be determined at the present time.'

The remaining larger half of that paragraph, which likely explained something of this uncertainty about ADF use of DSP and/or SBIRS data, was redacted, as was the whole of a short attachment to the submission (Attachment C) dealing with SBIRS data. These 2019 excisions in this Full Knowledge and Concurrence section are curious, since by 2019 the issues with which they appear to have dealt were a matter of detailed public record from Australian and US government sources.

The Australian Mission Processor

Within three years of the 1997 ministerial submission the Howard government's tentative plans for ADF use of DSP and SBIRS data had given rise to a small budget commitment, and eventually resulted in an operational ADF system called the Australian Mission Processor (AMP) in 2015.

Figure 6. Space Operations Section, 1 Remote Surveillance Unit, RAAF Edinburgh

Source: Jaimie Abbott and Melissa Vreugdenburg, 'One Giant Leap', *Air Force*, 7 September 2017, p. 12-13, at http://www.defence.gov.au/Publications/NewsPapers/Raaf/editions/5916/5916.pdf.

Initial planning for an Australian ground processor to use DSP data became caught up in repeated serious delays in the SBIRS system development itself, but by 2000 defence budget funding was provided for a minimum demonstrator processing facility to be operated by the Defence Science and Technology Organisation. Delayed further for more than a decade mainly by the vicissitudes of the troubled SBIRS program itself, the Australian Mission Processor built by the US company Northrop Grumman came online at RAAF Edinburgh in South Australia in September 2015. Operated by the RAAF's 1st Remote Surveillance Unit (1RSU), the AMP is intended to provide 'enhanced force protection and battle-space awareness' to the ADF and its coalition partners.[33] Research collaboration with the United States in ballistic missile defence has been one focus for the AMP and

its predecessors. The Australian navy is interested in the anticipated capacity of the AMP to give some minimal warning of the launch of ship-to-ship missiles, now used by a number of navies in areas of Australian naval operations, and more broadly as a foundation for an Australian Theatre Ballistic Missile System.[34] The Defence Science and Technology Organisation, 1st Remote Surveillance Unit, and Lockheed Martin have collaborated on a project to fuse DSP and SBIRS data with the Jindalee Operational Radar Network (JORN) operated by 1RSU and Lockheed Martin.

Given that government public documentation of the Australian Mission Processor and its operation by 1RSU has been readily available for a number of years, it is difficult to imagine unredacted publication of these parts of the ministerial submission in 2019 could have compromised 'current or future Defence operational procedures.'[35]

Who paid the piper?

Apart from the deletion of the whole of one paragraph-length section titled 'Defence and Foreign policy – Other Considerations' (§16), one final matter of curiosity about the extensive redactions from the cabinet submission concerns the section titled 'Financial Considerations', Two of its three paragraphs are redacted entirely (§25 and §27), leaving only consideration of the costs of winding down and mothballing Woomera (§26).

These redactions on matters of money are curious, if only because these sorts of agreements usually attend closely to financial arrangements. Was the establishment of the RGS yet another example of Australian governments paying little or nothing towards the operation of what are essentially U.S.-built and U.S.-paid for surveillance systems that only function as part of globally-distributed U.S. military technologies? Or did Australia offer to pay some part of the costs of the building and operation of the RGS? If so, why should that fact be censored? In recent years Australia has begun to pay some part of at least the costs of relocating a U.S. space telescope and space radar to North West Cape, in which case redacting in 2019 a 1997 offer to pay would be unlikely.

The question of what financial contribution the Australian government may have provided for any part of the Relay Ground Station at Pine Gap is important for much more than matters of historical truth and accuracy. The cost of the DSP system's satellites and ground stations design, construction and global operation was very considerable, and that of the SBIRS system notoriously greater. In the parallel case of the much larger signals intelligence part of the Pine Gap facility today, the small annual Australian financial contribution is allocated almost entirely to the salaries of the Australian staff involved. [36]

The Defense Support Program and the Space Based Infrared System were wholly creations of United States intelligence and defence organisations – US-designed, US-funded, and US controlled. Australia has made no known contribution to the costs of the design and construction of the SIGINT facility in the six decades of its existence, let alone the research, design and construction costs of the giant satellites controlled through Pine Gap. Who pays the piper generally calls the tune, with considerable implications for Australian sovereignty and capacity to influence the practice of the full range of DSP and SBIRS missions.

The voices in the room

It is obvious that attempting to interpolate the full meaning of cryptic parts of censored records of government decisions has its hazards. Not only have large parts of the NSC documents been excised, but we have no record of just which members of the committee were present on the day, and who said what. In the somewhat frail and decayed version of the Westminster system of government in Australia, ministers are greatly dependent on the advice and information they receive

from officials. We do not know which senior bureaucratic and military advisors were present, and how – or even whether – they spoke to particular parts of the ministerial submission. But it is reasonable to infer from what is now known of earlier periods of Pine Gap's history that some senior Defence Departmental officials would have had a much deeper knowledge than newly appointed ministers of the balance of risks and benefits attached to hosting the Relay Ground Station.[37]

After reading the cabinet documents and a draft version of this paper, former Secretary of Defence Paul Barratt remarked that

> 'Knowledge relating to the two omissions you note in the paper would have been present in the room, but as there is no sign that they were referenced in the Cabinet Submission, I doubt that anyone would have volunteered these aspects in the discussions - the advisers tend to speak when they are spoken to. This raises the question of whether Defence itself, either by accident or design, failed to bring all the relevant issues to the notice of NSC.'[38]

A lost opportunity for the reform of Pine Gap

In retrospect, it is clear that the U.S. request to close Nurrungar, centralize its former operations in the continental United States, and build a small, remotely operated Relay Ground Station on the edge of the Pine Gap signals intelligence facility provided the Australian government with a chance, early in the post-Cold War period, to reconsider its long and close support for United States nuclear war-fighting strategy, one of the most bitter fruits of the Cold War. The cabinet papers show that, whether by intention or by inattention born decades of alliance acquiescence, that opportunity was lost. The fact that the decision eventually opened the way for DSP and SBIRS data flowing through the RGS and back to the Australian Defence Force should have required consideration of an explicit assessment of the balance of consequences of continuing to the RGS. The task of reforming Pine Gap to address its role in nuclear weapons next use thereby became more difficult.[39]

III. ENDNOTES

[1] Cabinet Submission JH97/0423 - Establishment of a Joint Australia - United States Relay Ground Station at Pine Gap - Decision JH97/0423/NS, National Archives of Australia, Series Number: A14370, Control Symbol: JH1997/423, Barcode: 32383316, at https://recordsearch.naa.gov.au/SearchNRetrieve/NAAMedia/ShowImage.aspx?B=32383316&T=PDF.

[2] Stephan Frühling (2018), 'When Australian nuclear weapons could make sense', *The Strategist*, 30 January 2018, at: https://www.aspistrategist.org.au/Australian-nuclear-weapons-make-sense/; and Hugh White, *How to Defend Australia*, Latrobe University Press, 2019, pp. 231-248.

[3] The Howard government's first National Security was made up John Howard (Prime Minister), Tim Fisher (Deputy PM), Peter Costello (Treasurer), Alexander Downer (Foreign Affairs), and Daryl Williams (Attorney-General), Philip Ruddock (Immigration), and Ian McLachlan (Defence). Advisors present would normally have included the secretaries of the relevant departments, including Philip Flood (DFAT) and Tony Ayers (Defence), the Chief of the Defence Force (General John Baker), the individual armed services chiefs. Senate Finance and Public Administration Legislation Committee, *Answers to Questions on Notice*, Budget Estimates 2011-2012, Prime Minister and Cabinet Portfolio, Question reference number: 34, Senator: Suzanne Boyce, 8 July 2011, at http://www.aph.gov.au/~/media/Estimates/Live/fapa_ctte/estimates/bud_1112/pmc/pm34.ashx.

[4] Jeffrey T. Richelson, *America's Space Sentinels: DSP Satellites and National Security*, University Press of Kansas, 1999, pp. 56-58, citing Jacob Neufeld, *The Air Force in Space, 1970 – 1974*,

(Washington DC: Office of Air Force Space History, 1976) p. 33. See also Desmond Ball, *A Base for Debate: The US satellite station at Nurrungar*, (Sydney: Allen and Unwin), pp. 37-39.

[5] Statement of Reasons for Decision under Section 40 (5) of the *Archives Act 1983*, 1 January 2019, National Archives of Australia, Series Number: A14370, Control Symbol: JH1997/423, Barcode: 32383316, at https://recordsearch.naa.gov.au/SearchNRetrieve/NAAMedia/ShowImage.aspx?B=32383316&T=PDF.

[6] As of late 2015 these were designated Antennas 98-A, 98-B, 13-A, and 13-B (large); and Antennas 05-A, 05-B, and 12-A (small) in the identification system developed in Desmond Ball, Bill Robinson, and Richard Tanter, *The Antennas of Pine Gap*, Nautilus Institute Special Report, 22 February 2016, pp. 52-59, at https://nautilus.org/wp-content/uploads/2016/02/PG-Antenna-systems-18-February.pdf

[7] Antennas 99-A and 99-B in *The Antennas of Pine Gap*, pp. 52-59.

[8] As at Nurrungar, the RGS – and its DSP and SBIRS satellites themselves – have several different means of communicating with the Mission Control Station. In addition to the RGS satellite communications systems there is also a trans-Pacific terrestrial optical fibre connection, as well as satellite-to-satellite crosslinks, and direct download from satellites to combatant commands and mobile ground stations.

[9] Harry N. Waldron, *History of the Space and Missile Systems Center, October 1994 - September 1997, Volume I,* March 2002, pp. 110-112; and *History of the Space and Missile Systems Center, 1 October 1998 – 30 September 2001, Volume I*, p. 196.

[10] Harry N. Waldron, *History of the Space and Missile Systems Center, October 1994 - September 1997, Volume I,* March 2002, pp. 110-112, at https://nsarchive2.gwu.edu/NSAEBB/NSAEBB235/27.pdf; and *History of the Space and Missile Systems Center, 1 October 1998 – 30 September 2001, Volume I*, pp. 196-197, at https://nsarchive2.gwu.edu/NSAEBB/NSAEBB235/new47.pdf.

[11] Desmond Ball, *A Suitable Piece of Real Estate: American Installations in Australia*, Hale & Iremonger, 1980, pp. 65-71; Ball, *A Base for Debate*; and the 1980s work of journalists associated with the *National Times* such as Brian Toohey, Bill Pinwill and Marian Wilkinson. On the history of the DSP and SBIRS satellite systems, as well as US Air Force expressions of concerns with Ball's analysis, see Jeffrey T. Richelson, *America's Space Sentinels,* pp. 49-57 and 137-148; and Jeffrey T. Richelson (ed.), *Space-Based Early Warning: From MIDAS to DSP to SBIRS*, National Security Archive Electronic Briefing Book No. 235 (Updated), 8 January 2013, https://nsarchive2.gwu.edu//NSAEBB/NSAEBB235/20130108.html.

[12] At that time the 'other systems' would have included the U.S. PAVEPAWS and BMEWS long-range radar networks in the U.S., U.K., and Greenland.

[13] Ball, *A Base for Debate,* p. 71.

[14] Ball, *A Base for Debate*, p. 71. Robustly refuting Defence Minister Kim Beazley's assertion in August 1987 that Ball was 'simply incorrect' in describing the nuclear war-fighting functions of the DSP satellite system, Richelson explained that '…DSP could only [be] considered to have no war-fighting functions if it was assumed that the system would be neutralized in a Soviet first strike. Aside from the fact that the improvements in the SED sensor [Sensor Evolutionary development, which provided a three-fold increase in the number of infrared detectors over earlier versions] were

specifically intended to enhance the ability to use DSP data for war fighting, by allowing identification of empty silos and thus silos still containing missiles, any system that provided launch detection information during the course of a nuclear war would be used in conducting that war.' Jeffrey T. Richelson, *America's Space Sentinels*, p. 142.

[15] Ball, *A Base for Debate*, p. 73.

[16] Richard Tanter, *The "Joint Facilities" revisited – Desmond Ball, democratic debate on security, and the human interest,* Special Report, Nautilus Institute for Security and Sustainability, 12 December 2012, p.40-43; and Richard Tanter, 'Possibilities and effects of a nuclear missile attack on Pine Gap', *Australian Defence Facilities*, Nautilus Institute, 30 October, 2013, at

https://nautilus.org/briefing-books/australian-defence-facilities/possibilities-and-effects-of-a-nuclear-missile-attack-on-pine-gap/.

It is possible that these omissions or redactions would have raised the question of whether the RGS, when built, would continue to be such a high priority target as Nurrungar had certainly been. There would have been two grounds for raising this possibility.

The first, concerning Pine Gap as a whole in the post-Cold War world, would rest on the priority that China, with its vastly smaller number of long-range nuclear missiles compared with the Soviet Union and the Russian Federation, would allocate to Pine Gap. The base remains a 'lucrative' target, but China must allocate its small number of long-range missiles to an array of important targets, not all of which can be, by definition, of the highest priority. China will have to choose.

The second, specific to the RGS, would raise the issue of the level of redundancy built in to the SBIRS satellites and ground system, compared with the DSP system and Nurrungar. The RGS would be highly vulnerable to an attack, but the existence of DSP and SBIRS satellite-satellite crosslinks, and DSP and SBIRS satellite links to relay communications satellites, provide redundant linkages between SBIRS satellites and their control station (and back-up control station) in Colorado. Moreover, the early warning satellites also downlink directly to mobile ground stations in combat theatres. The net effect of these redundant linkages would be to considerably lower the consequences of an attack on the RGS for the viability of the US early warning system as whole. For the present it is enough to note that the redacted parts of the 1997 ministerial submission leave little space for such discussion. Had there been such a reference, there would be every reason for the Australian government to draw attention to the fact of possibly lowered risk to Pine Gap (and Alice Springs), rather than redact such a reference.

[17] Ball, *A Base for Debate*, p. 80.

[18] Ball, *A Base for Debate,* p. 80.

[19] Hayden cited in Ball, *A Base for Debate*, p. 82.

[20] Hayden cited in Ball, *A Base for Debate*, p. 82.

[21] Kim Beazley, presentation to *Seminar on the ANZUS alliance, Joint Standing Committee on Foreign Affairs, Defence and Trade, Parliament of Australia* (11 August 1997). According to a CIA presidential briefing on 13 February 1987, a draft of the 1987 Defence White Paper argued that Pine Gap and Nurrungar 'would be attacked in a US-Soviet nuclear exchange'. 'National Intelligence Daily, 13 February 1987', Central Intelligence Agency, Declassified in Part – Sanitized Copy Approved for Release 2012/11/09: CIA-RDP88T00091 R000400020008-4, at https://www.cia.gov/library/readingroom/docs/CIA-RDP88T00091R000400020008-4.pdf.

[22] Statement of Reasons for Decision under Section 40 (5) of the *Archives Act 1983*, 1 January 2019.

[23] Jeffrey T. Richelson, *America's Space Sentinels,* pp. 218, citing Office of the Under Secretary of Defense for Acquisition and Technology, *Report of the Defense Science Board Task Force on Space and Missile Tracking System*, August 1996, pp. 1-2.

[24] For numbers of Australian and U.S. personnel, 1972-1986, see Table 3.5 in Ball, *A Base for Debate*, p. 47.

[25] Richelson, *America's Space Sentinels*, pp. 145-6.

[26] Reply by the Minister for Foreign Affairs, Senator Gareth Evans, to a question on notice from Senator Mal Colston: *Hansard*, Senate, 'Questions Without Notice: Joint Facility at Nurrungar, 6 May 1993,'p. 248.

[27] *Hansard*, Senate, 'Questions Without Notice: Joint Facility at Nurrungar, 6 May 1993,' p. 248.

[28] Ball, *A Base for Debate*, pp. 39-47. According to a 1991 parliamentary committee Nurrungar was staffed at the time with personnel from the US Air Force, the US Navy, the Australian Navy, Army and Air Force, and a joint venture of AWA and Serco. In practice from beginning the nominally joint station was fundamentally a US Air Force facility operated by the 5th Defense Communications Squadron, reconstituted as the 5th Space Warning Squadron (5SWS) in 1992, and remaining at Nurrungar until the base's closure in 1999. From June 1995 5SWS was assigned to 21st Space Wing based at Peterson Air Force Base, Colorado. The 21st Space Wing, 'the U.S. Air Force's most geographically dispersed wing', concentrates on missile warning command and control and space surveillance. See Joint Standing Committee on Foreign Affairs, Defence and Trade, Report on the Visit of the Defence Sub-Committee to Nurrungar-Woomera and Northern Territory - October 1991, Parliament of Australia, 30 April 1992; 'Document 26: Air Force Space Command, History of Air Force Space Command, January - December 1990, n.d.', in Jeffrey T. Richelson (ed.), *Space-Based Early Warning: From MIDAS to DSP to SBIRS*; '5th Space Warning Squadron'; *USAF Orders of Battle*, at http://www.usafunithistory.com/PDF/5-9/5%20SPACE%20WARNING%20SQ.pdf; '5th Space Warning Squadron', *Wikipedia* [accessed 21 January 2019], at https://en.wikipedia.org/wiki/5th_Space_Warning_Squadron.

[29] Graeme Dobell, 'Australia-East Asia/US Relations: Election plus Marines, Joint Facilities and the Asian Century', *Comparative Connections*, September 2013, at http://cc.pacforum.org/2013/09/election-plus-marines-joint-facilities-asian-century/, summarizing Minister for Defence Stephen Smith – Ministerial Statement on Full Knowledge and Concurrence, House of Representatives, 26 June 2013. See also Minister for Defence, Christopher Pyne, 'Ministerial Statement - Joint Facilities: Enhancing Australia's Security and Prosperity', *Hansard*, House of Representatives, 20 February 2019, pp. 14049 – 14054: 'At a practical level, full knowledge and concurrence means: First, that Australia is to be consulted about any new purpose proposed for any activity, or a significant change to an existing purpose, and we will be advised of any significant change to expected outcomes. Second, it means that Australia will be briefed and advised on outcomes actually achieved. And finally, proposals for new equipment or significant upgrades to existing equipment, including communications links, will be advised in sufficient time to confirm that the changes align with mutually-agreed purposes, or to seek further clarification, if required.' (p. 140540)

[30] Ball, *A Base for Debate*, p. 43.

[31] Barry Rollings, 'Historic win for our Brad', *Air Force*, Vol. 50, No. 15, 21 August 21, 2008, p.7, at http://www.defence.gov.au/Publications/NewsPapers/Raaf/editions/5015/5015.pdf; Corporal James Matthews, '460th Operations Support Squadron', *News*, Buckley Air Force Base, USAF, 3 June 2009, at http://www.buckley.af.mil/news/story.asp?id=123151313; Andrew Stackpole, 'On the space trail', *Air Force*, Vol. 53, No.21, 10 November 2011, p. 18; FLTLT Gene Elliott, 'Satellite monitoring system comes online in September Joint force tracking items orbiting Earth', *Air Force*, Vol. 57, No.9, 21 May 2015, p. 13, at http://www.defence.gov.au/publications/newspapers/raaf/editions/5709a/5709a.pdf; Steve Henry, *Linked In* [accessed 17 Jan 2019] at https://www.linkedin.com/in/stenry123/?originalSubdomain=au.

[32] Stephan Frühling, *Ballistic Missile Defence for Australia: Policies, Requirements and Options*, Canberra papers on strategy and defence no. 151, Australian National University, 2003, pp. 60-61.

[33] Peter La Franchi, 'Australia approves cash for spy satellite ground installations', *Flight International*, 22-28 August 2000, p. 23, at http://www.flightglobal.com/FlightPDFArchive/2000/2000-1%20-%200717.PDF; FLTLT Gene Elliott, 'Satellite monitoring system comes online in September', *Air Force*, Vol. 57, No. 9, 21 May 2015, p. 13 at http://www.defence.gov.au/Publications/NewsPapers/Raaf/editions/5709a/5709a.pdf; 'CASG delivers leading edge battle-space awareness to Air Force', *CASG News*, Department of Defence, 25 August 2016, at http://www.defence.gov.au/casg/NewsMedia/News/CASGdeliversleadingedgebattle-spaceawarenesstoAirForce; and '1 RSU Space Systems', *Fact Sheets, Peterson Air Force Base*, 25 January 2017, at https://www.peterson.af.mil/About/Fact-Sheets/Display/Article/1059617/1-rsu-space-systems/.

[34] Commander Tom Mueller, RAN, *The Royal Australian Navy and Theatre Ballistic Missile Defence*, Sea Power Centre Australia, Working Paper No. 12, March 2003, p. 16, at http://www.navy.gov.au/sites/default/files/documents/Working_Paper_12.pdf.

[35] Statement of Reasons for Decision under Section 40 (5) of the *Archives Act 1983*, 1 January 2019.

[36] According to the most recently published official figures, the $14 mn. Australia contributed to the running of Pine Gap (as a whole), mainly paid for the salaries of Australian personnel working at the base. See Desmond Ball, Bill Robinson, and Richard Tanter, *Australia's participation in the Pine Gap enterprise*, Nautilus Institute Special Report, 8 June 2016, pp. 51-53.

[37] Desmond Ball, Bill Robinson and Richard Tanter, *Australia's participation in the Pine Gap enterprise*, pp.11-18.

[38] Personal communication, 31 July 2019. Barratt took up the position of Secretary of Defence some months after the NSC deliberations of September 3rd, 1997.

[39] For a brief proposal for reform of the most egregious way in which Pine Gap contradicts the Treaty on the Prohibition of Nuclear Weapons, see Richard Tanter, 'An Australian pathway through Pine Gap to the nuclear ban treaty', *Pearls & Irritations*, 5 August 2019, at https://www.johnmenadue.com/richard-tanter-an-australian-pathway-th-ough-pine-gap-to-the-nuclear-ban-treaty/.

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