

U.S. Space Power and Alliance Dynamics in the Cold War

Aaron Bateman

An odd sight appeared in 1970 when U.S. and Australian workers erected what appeared to be gigantic golf balls near Woomera in the Australian outback. These space-age-looking structures were surrounded by a security barrier that prevented any unauthorized personnel from accessing the base called Nurrungar, an Aboriginal word meaning “to hear.”¹ From the beginning, Australian officials were tight-lipped about its purpose, disclosing only that it would be used for sending data to and from U.S. defense communications satellites. Australian politicians reassured concerned citizens that the site was purely defensive and enhanced the mutual security interests of Australia and the United States. The golf balls were in fact radomes that housed antennas for receiving data from U.S. satellites that were designed to detect Soviet nuclear missile attacks. These antennas secretly transformed the outback into a vital node in the U.S. nuclear command and control system.

Finding suitable territories to host U.S. space infrastructure—facilities for tracking, surveilling, and communicating with satellites—proved to be a challenging task both technically and politically.² All satellites, regardless of func-

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1. On Nurrungar, see: Desmond Ball, *A Suitable Piece of Real Estate: American Installations in Australia* (Sydney: Hale and Iremonger, 1980); Desmond Ball, *A Base for Debate: The U.S. Satellite Station at Nurrungar* (Sydney: Allen and Unwin, 1987); Jeffrey T. Richelson, *America's Space Sentinels: The History of the DSP and SBIRS Satellite Systems* (Lawrence: University Press of Kansas, 2012).

2. There is an overlap between U.S. intelligence, nuclear, and space infrastructures. For the purposes of this article, “space infrastructure” does not include launch sites. On the politics of intelligence infrastructure, see: Diana Bolsinger, “Not at Any Price: LBJ, Pakistan, and Bargaining in an Asymmetric Intelligence Relationship,” *Texas National Security Review*, Vol. 5, No. 1 (Winter 2021/22), pp. 55–80, <https://doi.org/10.15781/fhq7-5868>; Cullen G. Nutt, “‘Vital and Irreplaceable Facilities’: Explaining Leverage When States Host Great Power’s Spying

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tion, need ground stations to both control them and receive their data.³ Without this infrastructure, satellite data cannot reach users on the ground. Losing a site because of either an enemy attack or host-nation expulsion would degrade certain functions, such as reconnaissance or nuclear early warning, in particular areas of the globe. But there was no single point of vulnerability on the ground for all U.S. space systems. Since terrestrial stations had to be in specific places to be in view of satellites as they moved around the Earth, getting access to particular territories to host these facilities heavily shaped U.S. foreign policy. Securing basing rights was complicated by the fact that antennas used for communicating with military and civilian satellites were nearly identical, making it difficult to distinguish between civilian and military space infrastructure.⁴ Some countries refused to permit even purely civilian U.S. satellite ground stations on their territory because they suspected that such facilities had a secret military purpose. Host nations expelling U.S. space facilities thus became a significant vulnerability for the United States.

Using declassified documents from Australia, the United Kingdom (UK), and the United States, this article argues that allies, particularly Australia and Britain, were critical for U.S. space power in the Cold War because they provided the United States access to land for basing space infrastructure.⁵

Operations," *Intelligence and National Security*, Vol. 39, No. 5 (2024), pp. 841–863, <https://doi.org/10.1080/02684527.2023.2292389>; Sarah Mainwaring and Richard J. Aldrich, "The Secret Empire of Signals Intelligence: GCHQ and the Persistence of the Colonial Presence," *International History Review*, Vol. 43, No. 1 (2021), pp. 54–71, <https://doi.org/10.1080/07075332.2019.1675082>; Kristie Macrakis, *Nothing Beyond Our Reach: America's Techno-Spy Empire* (Washington, DC: Georgetown University Press, 2023).

3. On the politics of basing space infrastructure, see: David C. Arnold, *Spying from Space: Constructing America's Satellite Command and Control Systems* (College Station: Texas A&M University Press, 2008); Bleddyn E. Bowen, *Original Sin: Power, Technology, and War in Outer Space* (Oxford: Oxford University Press, 2022), chap. 4; Teasel Muir-Harmony, "Tracking Diplomacy: The International Geophysical Year and American Scientific and Technical Exchange with East Asia," in Roger D. Launius, James Rodger Fleming, and David H. DeVorkin, eds., *Globalizing Polar Science: Reconsidering the International Polar and Geophysical Years* (New York: Palgrave Macmillan, 2011); Asif Siddiqi, "Shaping the World: Soviet-African Technologies from the Sahel to the Cosmos," *Comparative Studies of South Asia, Africa and the Middle East*, Vol. 41, No. 1 (May 2021), pp. 41–55, <https://doi.org/10.1215/1089201X-8916932>; Christine E. Evans and Lars Lundgren, *No Heavenly Bodies: A History of Satellite Communications Infrastructure* (Cambridge, MA: MIT Press, 2023).

4. On distinguishability, see Jane Vaynman and Tristan A. Volpe, "Dual Use Deception: How Technology Shapes Cooperation in International Relations," *International Organization*, Vol. 77, No. 3 (Summer 2023), pp. 599–632, <https://doi.org/10.1017/S0020818323000140>.

5. On space and alliance dynamics, see: John Krige, Angelina Long Callahan, and Ashok Maharaj, *NASA in the World: Fifty Years of International Collaboration in Space* (New York: Palgrave, 2013); Aaron Bateman, *Weapons in Space: Technology, Politics, and the Rise and Fall of the Strategic Defense Initiative* (Cambridge, MA: MIT Press, 2024), chap. 6. On the U.S.-UK alliance, see: John Baylis, *Anglo-American Defence Relations 1939–84*, 2nd ed. (London: Macmillan 1984); H. C.

Scholarship on the role of space in military affairs, grand strategy, and alliance politics tends to focus on activities in space while neglecting the critical role of terrestrial space infrastructure.⁶ Political scientist Barry Posen argues that one pillar of U.S. hegemony is its “command of the commons—command of the sea, space, and air.”⁷ But the United States would have been unable to project power through space without a global infrastructure on the ground for controlling satellites, receiving their data, and surveilling foreign satellites.⁸ In stark contrast to the United States, the Soviet Union was unable to build a similar terrestrial space infrastructure, in part because of its lack of access to suitable territories.⁹ This situation helped skew the superpower military balance in space in the United States’ favor.¹⁰

This article further reveals that basing space infrastructure on allied territories was politically challenging for Washington, although the difficulties of doing so in Australia and in the UK (including its overseas territories) varied. In the early 1970s, U.S. officials worried that Australia might expel U.S. space facilities in response to allegations that they violated Australia’s sovereignty and made it a nuclear target. Ever since, it has been challenging for the United States to navigate the domestic politics associated with maintaining military space infrastructure on Australian territory. UK colonial territories gaining independence similarly threatened the security of tenure—the ability to keep a facility in place and operational—of key U.S. space sites in the Indian Ocean.

Allen, *Great Britain and the United States: A History of Anglo-American Relations (1783–1952)* (New York: St. Martin’s Press, 1954). On U.S.-Australia alliance dynamics, see James Curran, *Unholy Fury: Whitlam and Nixon at War* (Melbourne: Melbourne University Press, 2015); Allan Gyngell, *Fear of Abandonment: Australia in the World Since 1942* (Melbourne: La Trobe University Press, 2017).

6. On space and military power, see: Bateman, *Weapons in Space*; Bowen, *Original Sin*; James Clay Moltz, *The Politics of Space Security: Strategic Restraint and the Pursuit of National Interests* (Stanford, CA: Stanford University Press, 2008); Paul B. Stares, *The Militarization of Space: U.S. Policy, 1945–1984* (Ithaca, NY: Cornell University Press, 1985).

7. Barry R. Posen, “Command of the Commons: The Military Foundation of U.S. Hegemony,” *International Security*, Vol. 28, No. 1 (Summer 2003), pp. 5–46, <https://doi.org/10.1162/016228803322427965>.

8. Satellite ground stations can be likened to the coaling stations that were so vital for the projection of maritime power in the nineteenth and twentieth centuries. See Barry M. Lechman and Robert G. Weinland, “Why Coaling Stations Are Necessary in the Nuclear Age,” *International Security*, Vol. 2, No. 1 (Summer 1977), pp. 88–99, <https://doi.org/10.2307/2538661>.

9. Compared with the United States, the Soviet Union had a much larger landmass that extended across Eastern Europe and Asia and reduced its need for ground stations overseas. On Soviet space tracking, see Siddiqi, “Shaping the World.”

10. Ground stations were not the only factor. The United States also produced military, intelligence, and civilian satellites that were far more sophisticated than the Soviet Union’s, largely because of U.S. advantages in electronics and information networking.

But unlike Australia, Britain was a nuclear weapons state. Consequently, UK officials were not worried that hosting U.S. space infrastructure, especially in British territories, might make the UK a nuclear target. To the chagrin of U.S. policymakers, technological advancements could not mitigate U.S. terrestrial dependencies. Indeed, as satellite technologies evolved, access to overseas territories for space infrastructure became even more important for the United States. This Cold War reality continues today.

The article proceeds chronologically, beginning with an overview of the technical requirements that drove the U.S. development of satellite tracking networks across the globe beginning in the 1950s and 1960s. The second section details some of the early political challenges associated with basing space infrastructure in Africa, and the subsequent U.S. push to rely more heavily on allied territories. The third section investigates how the U.S. requirement to base space infrastructure in the Indian Ocean shaped Anglo-American alliance dynamics. The fourth section analyzes how the United States' need for a Southern Hemisphere location for civilian and military space infrastructure affected its relationship with Australia. I devote more attention to Australia than Britain because the former hosted far more U.S. space infrastructure than any other U.S. ally or partner during the Cold War. The conclusion presents the implications of these Cold War case studies for intensifying U.S.-China space competition today.

Building a Global Space Infrastructure

Even before the space age began with the launch of Sputnik in 1957, U.S. technical experts recognized that tracking stations would be needed around the world to support military and civilian space missions. RAND acknowledged this point in a 1946 report that recommended launching satellites into equatorial orbits so that they could be easily tracked by a network of radars placed around the equator.¹¹ (Ultimately, however, the United States would deploy satellites in multiple orbits, which required ground stations at different latitudes.) Engineers designed beacons to be placed on satellites that transmitted telemetry (from the Greek *tele* [remote] and *metron* [measure]) signals that contained data about the temperature of spacecraft critical components, pressure

11. Douglas Aircraft Company, *Preliminary Design of an Experimental World-Circling Spaceship*, Report No. SM-11827 (Santa Monica, CA: RAND, 1946), https://www.rand.org/content/dam/rand/pubs/special_memoranda/2006/SM11827part1.pdf.

levels in fuel tanks, spacecraft orientation, power levels, and the status of propulsion systems. At ground stations, technical personnel both received telemetry and sent commands to satellites for a range of purposes, including telling reconnaissance satellites where to point their cameras. The U.S. satellite “reconnaissance revolution” would not have been possible without overseas ground stations at key points, including in Greenland, the Indian Ocean, and the UK.¹²

In the late 1950s, the rapid expansion of U.S. civilian and military space projects precipitated the development of global satellite tracking networks. In 1958, the Dwight D. Eisenhower administration established the National Aeronautics and Space Administration (NASA) as a civilian space agency to oversee scientific and human space exploration missions. Three years later, in September 1961, Secretary of Defense Robert McNamara and Central Intelligence Agency (CIA) Director Allen Dulles established the covert National Reconnaissance Office (NRO) to oversee the nation’s clandestine space reconnaissance program.¹³ NRO tracking stations fell under the management of the Air Force Satellite Control Network that carried out command and control for all Department of Defense satellites.¹⁴ Concurrently, the Pentagon expanded its Atlantic and Pacific Missile Ranges, which consisted of radar and telemetry stations on U.S. and foreign territories that stretched from Vandenberg, California, to the Marshall Islands in the Pacific, and from Cape Canaveral, Florida, to Pretoria, South Africa in the Atlantic.¹⁵ These radars and telemetry stations were used to closely monitor missiles during test firings as well as spacecraft in their initial orbits. By the mid-1960s, NASA and the Department

12. On the “reconnaissance revolution,” see John Lewis Gaddis, “The Long Peace: Elements of Stability in the Postwar International System,” *International Security*, Vol. 10, No. 4 (Spring 1986), pp. 99–142, <https://doi.org/10.2307/2538951>.

13. For histories of satellite reconnaissance and the National Reconnaissance Office (NRO), see: Jeffrey T. Richelson, *America’s Secret Eyes in Space: The U.S. Keyhole Spy Satellite Program* (New York: Harper Collins, 1990); Dwayne A. Day, John M. Logsdon, and Brian Latell, eds., *Eye in the Sky: The Story of the Corona Spy Satellites* (London and Washington, DC: Smithsonian Press, 1998); Thomas Graham Jr. and Keith Hansen, *Spy Satellites and Other Technologies That Changed History* (Seattle: University of Washington Press, 2007); Pat Norris, *Spies in the Sky: Surveillance Satellites in War and Peace* (New York: Springer Praxis Books, 2008); Philip Taubman, *Secret Empire: Eisenhower, the CIA, and the Hidden Story of America’s Space Espionage* (New York: Simon and Schuster, 2003).

14. Roger A. Jernigan, “Air Force Satellite Control Facility: Historical Brief and Chronology 1954–Present (Sunnyvale AFS, CA: AFSCF History Office, 1989), p. 9, https://www.nro.gov/Portals/135/documents/foia/declass/WS117L_Records/266.PDF.

15. See Cliff Leithbridge, *Cape Canaveral: 500 Years of History, 50 Years of Rocketry* (Merritt Island, FL: Space Coast Cover Service, 2000), chap. 2. Cape Canaveral was known as Cape Kennedy until 1973.

of Defense possessed tracking stations in Africa, Asia, the Caribbean, Latin America, and Oceania.¹⁶

Because their antennas needed to be in view of satellites as they passed overhead, orbital mechanics mostly determined the locations for military and civilian satellite tracking facilities. This requirement posed unique challenges in some instances. For example, in the early 1960s the United States began searching for a suitable Arctic location for tracking and communicating with satellites in polar orbit, meaning that satellites followed a trajectory around the poles. Fortunately, the United States already possessed Thule Air Base in Greenland and therefore negotiated an agreement with Denmark to collocate a space tracking station with the U.S. Ballistic Missile Early Warning System already in place.¹⁷ (Notably, this situation required entangling space and nuclear command and control systems, since data for both the U.S. Ballistic Missile Early Warning System and the tracking station would use the same information networks to transmit the data back to the United States.)¹⁸

The antennas used to communicate with defense and civilian satellites were identical, but two separate infrastructures were needed for technical and political reasons. Some defense satellites were in different orbits than their civilian counterparts, which necessitated placing ground stations in locations that were not useful to NASA. In other instances, political considerations were paramount. Some countries refused to host satellite ground stations that had an overt military role. In 1960, an Australian defense official in Washington observed that “the U.S. Department of Defense is having some difficulty in finding countries around the world which will permit [it] ... to operate space

16. Sunny Tsiao, *Read You Loud and Clear! The Story of NASA's Spaceflight Tracking and Data Network* (Washington, DC: National Aeronautics and Space Administration [NASA], 2008); David C. Arnold, “Supporting New Horizons: The Evolution of the Military Satellite Command and Control Systems, 1944–1969” (Ph.D. dissertation, Auburn University, 2002), <https://apps.dtic.mil/sti/tr/pdf/ADA403222.pdf>.

17. Arnold, “Supporting New Horizons,” p. 178.

18. On entanglement, see: Caitlin Talmadge, “Would China Go Nuclear? Assessing the Risk of Chinese Nuclear Escalation in a Conventional War with the United States,” *International Security*, Vol. 41, No. 4 (Spring 2017), pp. 50–92, https://doi.org/10.1162/ISEC_a_00274; Fiona S. Cunningham and M. Taylor Fravel, “Assuring Assured Retaliation: China’s Nuclear Posture and U.S.-China Strategic Stability,” *International Security*, Vol. 40, No. 2 (Fall 2015), pp. 37–45, https://doi.org/10.1162/ISEC_a_00215; Wu Riqiang, “Assessing China-U.S. Inadvertent Nuclear Escalation,” *International Security*, Vol. 46, No. 3 (Winter 2021/22), pp. 128–162, https://doi.org/10.1162/isec_a_00428; Robert Samuel Wilson and Russell Rumbaugh, “Reversal of Nuclear-Conventional Entanglement in Outer Space,” *Journal of Strategic Studies*, Vol. 47, No. 1 (2024), pp. 64–91, <https://doi.org/10.1080/01402390.2023.2249622>.

tracking stations on their soil.”¹⁹ Regardless, the separate defense and civilian infrastructures for communicating with satellites reflected the Janus-faced nature of the U.S. space program, especially the porous boundaries between civilian and military capabilities.²⁰ NASA, the Department of Defense, and the intelligence community occasionally used the same infrastructure for communicating with, tracking, and surveilling satellites.²¹

Because satellite tracking antennas were outwardly identical to those secretly used for intercepting data from foreign satellites, they provided a cover, in some cases, for clandestine intelligence facilities. General William Smith of the National Security Council highlighted this point in a letter to National Security Advisor McGeorge Bundy in 1964, observing that “at some land-based [tracking] facilities considerable covert intelligence activities are accomplished.”²² At a number of covert sites—including TACKSMAN (Iran), STONEHOUSE (Ethiopia), and BANKHEAD (Pakistan)—the United States kept tabs on Soviet satellites.²³ Through telemetry interception at these locations, intelligence analysts monitored Soviet cosmonauts in orbit, tracked the performance of Soviet space weapons, and determined which locations Soviet reconnaissance satellites were imaging.²⁴

In addition to these covert facilities, the United States depended on a network of radars and sophisticated Baker-Nunn cameras that formed the Pentagon’s Space Detection and Tracking System (SPADATS), which was

19. Letter from P. M. Twiss to Knott, August 4, 1960, 3044476, National Archives of Australia (NAA), Canberra.

20. See introduction, Bateman, *Weapons in Space*.

21. In 1959, NASA and the U.S. Department of Defense signed a satellite tracking agreement. See “A National Program to Meet Satellite and Space Vehicle Tracking and Surveillance Requirements for FY 1959 and 1960,” January 19, 1959, Record Group (RG) 59, Records Relating to Atomic Energy Matters, 1944–1963, box 265, Space Council Jan–June 1959, National Archives and Records Administration (NARA), via National Security Archive (NSA) online, The George Washington University, <https://nsarchive.gwu.edu/document/29906-document-2-national-aeronautics-and-space-administration-and-department-defense>.

22. It is unclear what specific sites this memorandum was referring to. Memorandum from Smith to Bundy, “Tracking Stations,” April 13, 1964, National Security Action Memorandums (NSAMs), National Security Files (NSF), box 4, folder 1-13-14-64, Lyndon B. Johnson Presidential Library (LBJ Library), Austin, TX.

23. Richard L. Bernard, *The Foreign Missile and Space Telemetry Collection Story—The First Fifty Years, Part One: The 1950s and 1960s*, Vol. 8 (Annapolis Junction, MD: Center for Cryptologic History, National Security Agency, 2004), chap. 2, https://archive.org/details/foreign_missile_1-nsa.

24. “Chapter 2, The SPACOL Plan and DEFSMAC (Early 1960s),” National Archives, February 1, 2025, p. 33, <https://www.archives.gov/files/declassification/iscap/pdf/2012-001-doc-1-part-2.pdf>; “Soviet Photographic Coverage,” *Defense Intelligence Notice*, DIADIN 2958-75 (Washington, DC: Defense Intelligence Agency, 1975), via NSA, <https://nsarchive2.gwu.edu/NSAEBB/NSAEBB501/docs/EBB-23.pdf>; Bernard, *The Foreign Missile and Space Telemetry Collection Story*.

used to track U.S. and foreign spacecraft.²⁵ SPADATS populated the North American Aerospace Defense Command's "space catalog" of all satellites in orbit. SPADATS also served as the primary means of targeting Soviet satellites for U.S. anti-satellite weapons.²⁶ This potential offensive role led to controversy in the early 1970s at an Air Force Baker-Nunn site near Canterbury, New Zealand, where local activists called for its expulsion.²⁷ U.S. Air Force personnel at these facilities often had to keep the peace with host-nation populations.

Washington's ability to secure access to foreign real estate to host satellite tracking and space surveillance facilities was a source of comparative advantage in an intensifying superpower competition with the Soviet Union. With this infrastructure, the United States' global system of spacecraft command and control and ability to surveil its adversary's activities in orbit were both superior to Moscow's. Conversely, the Soviet Union struggled to obtain similar access to overseas territories necessary for developing its own global network. CIA analysts highlighted this point in a 1962 National Intelligence Estimate (NIE), writing that "the chief limitation on Soviet capabilities for tracking and communicating with space vehicles is the lack of a global tracking network capable of continuous observation and communications with satellites and space probes."²⁸

To fill gaps in its tracking network outside the Soviet Union, the Kremlin depended on specially instrumented space-support ships. But U.S. technical experts pointed out that "the value of these ships is limited," because of the (literal) instability associated with sea-based tracking platforms.²⁹ The Soviets were able to negotiate agreements to place satellite tracking equipment in Chile and Cuba and expressed an interest in placing similar hardware in Afghanistan, Australia, Indonesia, and Somalia.³⁰ Yet Moscow

25. Rick Sturdevant, "From Satellite Tracking to Space Situational Awareness: The USAF and Space Surveillance," *Air Power History*, Vol. 55, No. 4 (Winter 2008), pp. 6–23, <https://www.jstor.org/stable/26275054>.

26. Clayton K. S. Chun, *Shooting Down a 'Star': Program 437, the US Nuclear ASAT System and Present-Day Copycat Killers*, CADRE Paper No. 6 (Montgomery, AL: Air University Press, 2000), p. 16, <https://apps.dtic.mil/sti/html/tr/ADA377346/index.html>.

27. Samuel C. Beamer, "Nerve Center for Space Defense," *Air University Review*, Vol. 24, No. 6 (September–October 1973), p. 73, <https://babel.hathitrust.org/cgi/pt?id=coo.31924106381670&seq=1104&q1=Nerve+Center+for+Space+Defense>; Grant Edward Twaddle, "The U.S. Military Presence in New Zealand," (master's thesis, University of Canterbury, 1983), pp. 92–111, <http://dx.doi.org/10.26021/12635>.

28. "The Soviet Space Program," December 5, 1962, National Intelligence Estimate (NIE) 11-1-62, CIA CREST Database, DOC_0000283833, <https://www.cia.gov/readingroom>.

29. Ibid.

30. It is unclear if the Soviet Union had an operational satellite tracking station in Indonesia. See

succeeded in establishing a long-term satellite tracking capability only in Cuba.³¹ Consequently, the Soviet Union continued to heavily depend on sea-based satellite tracking, which was less sophisticated but also free of the political difficulties associated with basing satellite tracking stations abroad.³²

The Tyranny of Geography

Early in the space age, the United States learned that basing space infrastructure on non-allied territories generated significant political risks. Two cases, South Africa and Zanzibar, were especially influential in this regard. In 1960, U.S. officials selected South Africa for an air force tracking station since it was in an ideal location to monitor satellites launched from Cape Canaveral. But U.S. officials became frustrated by South Africa's eagerness to use the facility as leverage in negotiations over politically controversial issues, including arms deals.³³ Zanzibar's location made it well-suited to track and communicate with NASA's early crewed space missions. When the United States settled on Zanzibar in 1960, it was still a British protectorate, but post-independence anti-U.S. sentiments quickly led to the United States being expelled from the island.³⁴ Neither location had a nuclear command and control role, thus host-nation anxieties that these facilities would make them a nuclear target did not arise.

U.S. officials were forced to confront the political risks associated with basing space infrastructure abroad when the Pentagon determined in 1960 that

Biweekly Report, "Sino-Soviet Bloc Economic Activities in Underdeveloped Areas," March 13, 1961, CIA CREST Database, CIA-RDP92B01090R000700020005-4. The Soviets also placed satellite tracking facilities across Africa for geodesy. See Siddiqi, "Shaping the World," p. 42.

31. *Study Pertaining to the National Lunar Program*, Vol. 3, *National Security Implications of US-USSR Cooperative Lunar Venture* (Santa Monica, CA: RAND, 1964), National Archives, <https://www.archives.gov/files/declassification/isca/pd/2009-068-doc10.pdf>. For background on the Soviet tracking station in Cuba, see "Soviet to Build Satellite Tracking Station in Cuba," February 27, 1964, New York Times, <https://www.nytimes.com/1964/02/27/archives/soviet-to-build-satellite-tracking-station-in-cuba.html>. For an overview of the Soviet facility in Chile, see "Latin America Looks to Eastern Europe," March 29, 1968, CIA CREST Database, CIA-RDP79-00927A006300080005-2.

32. The United States used tracking vessels to fill gaps in its global satellite tracking network to support its civilian and defense space programs.

33. Letter from the Deputy Secretary of Defense (Gilpatric) to the Under Secretary of State (Bowles), March 16, 1961, *Foreign Relations of the United States (FRUS)*, 1961–1963, Vol. 21, *Africa*, ed. Nina Davis Howland (Washington, DC: Government Printing Office [GPO], 1995), doc. 376, <https://history.state.gov/historicaldocuments/frus1961-63v21/d376>.

34. Lisa Parks, "Global Networking and the Contrapuntal Node: The Project Mercury Earth Station in Zanzibar, 1959–64," *ZMK Zeitschrift für Medien-und Kulturforschung*, Vol. 41, No. 1 (2020), p. 46, <https://doi.org/10.25969/mediarep/18750>.

it needed to expand the Atlantic Missile Range (now the Eastern Test Range) into southern Africa in order to receive telemetry from missile test firings and space launches from Cape Canaveral.³⁵ After surveying a number of places, General Donald Yates, the commander of the Air Force Missile Test Center, settled on an area near Pretoria, South Africa. This location met the criteria of low population density, a lack of radio frequency interference, and an airport within driving distance.

The political situation in South Africa, however, proved to be a significant problem. With controversy over apartheid intensifying, Washington had to weigh the technical benefits of moving U.S. tracking infrastructure into South Africa against the political costs of strengthening political ties with a pariah regime. U.S. policymakers questioned whether ship-based satellite tracking would be a suitable alternative, but Deputy Secretary of Defense Roswell Gilpatric argued against this option, stressing that “there is no reasonable prospect that such an unstable [ship] platform could provide reliable and accurate tracking.”³⁶ U.S. officials also considered alternative locations in Africa, such as Bechuanaland (present-day Botswana), Mozambique, Rhodesia (present-day Zimbabwe), and Zanzibar.³⁷ But concerns about political instability combined with insufficient logistical infrastructure in these other locations made South Africa the preferred option.

Soon after the U.S. Air Force tracking station came online in 1961, South Africa began using it as leverage in its relationship with Washington.³⁸ Undersecretary of State Chester B. Bowles was frustrated that because of the U.S. Air Force facility, “we are under direct and indirect pressure to make concessions to this government which are bound to be costly to us in the United Nations and in our relations with the world generally.”³⁹ In addition to the political benefits of close association with the United States, South African leaders sought to use hosting the tracking station as a quid pro quo for military aid.⁴⁰ Gilpatric responded by ordering a reevaluation of the requirement

35. Letter from the Deputy Secretary of Defense (Gilpatric) to the Under Secretary of State (Bowles).

36. Memorandum from Smith to Bundy, “Tracking Stations,” April 13, 1964.

37. Letter from the Deputy Secretary of Defense (Gilpatric) to the Under Secretary of State (Bowles).

38. NASA also constructed multiple tracking stations in South Africa. See Tsiao, *Read You Loud and Clear!*

39. Letter from the Under Secretary of State (Bowles) to the President’s Special Assistant for National Security Affairs (Bundy), September 21, *FRUS, 1961–1963*, Vol. 21, doc. 386, <https://history.state.gov/historicaldocuments/frus1961-63v21/d386>.

40. Among other things, South Africa sought to use the tracking station as leverage to purchase

for a South Africa tracking station. But his deputies affirmed that the facility was vital.

Moving the tracking station elsewhere would have delayed the development of long-range ballistic missiles and certain space projects, including Missile Defense Alarm System (MIDAS) nuclear early warning satellites. With multiple MIDAS launches planned for 1961 and 1962, Gilpatric warned Bowles that “lack of data on more than one of these shots could cause unacceptable delay or damage to the program.”⁴¹ The South African tracking station was not a nuclear command and control node, but it was critical for the development of nuclear delivery vehicles as well as space-based systems used to control U.S. strategic forces. With all these factors in mind, Gilpatric stressed the continuing importance of the South African tracking station but added that “we should be prepared to withdraw from the station should this prove politically necessary.”⁴²

A little more than 1,800 miles away on the small island of Zanzibar, decolonization threatened a key facility in NASA's global command and control network. Even before the NASA facility in Zanzibar became operational in 1960, anticolonial forces in the form of the Zanzibar National Party (ZNP) were pushing for complete independence from the United Kingdom. They viewed the NASA facility as a symbol of U.S. imperialism. ZNP depictions of the United States as new colonizers resonated with the concerns expressed during a 1961 All Africa Peoples Conference meeting in Cairo when African leaders called for the United States to remove all of its space and military infrastructure from Africa.⁴³ U.S. diplomats and intelligence officers believed that the hidden hand of Soviet and Chinese communist agitators was stirring

submarines from the United States, though the deal never went through. Memorandum from Secretary of State Dean Rusk to President Kennedy, South African Interest in Purchase of U.S. Submarines, March 16, 1963, NSF, Countries Series, Africa, General, John F. Kennedy Presidential Library, Boston, MA, <https://2001-2009.state.gov/r/pa/ho/frus/kennedyjft/50766.htm>.

41. Letter from Deputy Secretary of Defense (Gilpatric) to the Undersecretary of State (Bowles), May 17, 1961, *FRUS, 1961–1963*, Vol. 21, doc. 378, <https://history.state.gov/historicaldocuments/frus1961-63v21/d378>.

42. Letter from Deputy Secretary of Defense (Gilpatric) to the Undersecretary of State (Ball), April 9, 1963, *FRUS, 1961–1963*, Vol. 21, doc. 402, <https://history.state.gov/historicaldocuments/frus1961-63v21/d402>. The Pentagon agreed to close the station in 1977 as relations with South Africa deteriorated. See Memorandum from the Executive Secretary of the Department of State (Tarnoff) to the President's Assistant for National Security Affairs (Brzezinski), November 10, 1977, *FRUS, 1977–1980*, Vol. 16, *Southern Africa*, ed. Myra F. Burton (Washington, DC: Government Printing Office, 2016), doc. 319, <https://history.state.gov/historicaldocuments/frus1977-80v16/d319>.

43. Parks, “Global Networking and the Contrapuntal Node,” p. 46.

up trouble.⁴⁴ The worst U.S. fears came true when Zanzibar gained independence in December 1963. One month later, its first president, Abeid Amani Karume, ordered the closure of the station by April 1964.⁴⁵

U.S. officials worried that the Zanzibar incident could prompt other countries to expel U.S. space tracking facilities from their own territories. One month after all NASA personnel departed Zanzibar, Bundy signed National Security Action Memorandum (NSAM) 300, which called for an interagency review of alternative communications, navigation, missile and space tracking, and data acquisition facilities.⁴⁶ The memo stated that both military and civilian space tracking facilities were potential targets for anti-American forces. U.S. officials noted that an overt “military presence, may be more susceptible than a NASA tracking station . . . but even these may be ejected by an unsophisticated or communist dominated government, as was the case of the NASA station in Zanzibar.”⁴⁷ Moving forward, the NSAM 300 report recommended securing basing agreements from U.S. allies, specifically “Western Europe, Canada, Australia, and New Zealand,” since only they could “offer a comfortable degree of certainty of continuing availability for the U.S. overseas facilities concerned.”⁴⁸

Relying solely on territories under the control of allies did not, however, become official U.S. policy. Indeed, in 1964 NASA placed a tracking facility in Madagascar that it would lose ten years later because of a revolution.⁴⁹ But the potential for political instability to adversely affect U.S. space infrastructure around the world prompted U.S. officials to leverage the territories of its closest allies. In this context, Britain’s territories in the Atlantic and the Indian Oceans were especially important. Following the political difficulties surrounding U.S. space sites in South Africa, Australian real estate was the best option for hosting space infrastructure in the Southern Hemisphere.

44. “The Zanzibar Revolt of 12 January 1964: In Retrospect,” October 26, 1964, CIA CREST Database, CIA-RDP83-00764R000700120001-2.

45. Parks, “Global Networking and the Contrapuntal Node,” p. 56.

46. Memorandum for Mr. McGeorge Bundy, White House, “Comments on Report in Response to NSAM 301,” January 5, 1965, NSAMs, NSF, box 4, LBJ Library, <https://www.discoverljb.org/item/nsf-nsam-b4-f07>.

47. Memorandum for Deputy Director for Central Intelligence, “NSAM 300: Review of Alternate Communications, Navigation, Missile and Space Tracking and Data Acquisition Facilities,” July 8, 1965, CIA CREST Database, CIA-RDP80B01676R000300020008-1.

48. Ibid.

49. Tsiao, *Read You Loud and Clear!* p. 124.

Space Infrastructure and the U.S.-UK Alliance

U.S. space facilities hosted in British territories in the Indian Ocean filled a gap in the global U.S. Air Force tracking network used for command and control of military and intelligence satellites. But Britain could not guarantee security of tenure at all U.S. Indian Ocean facilities. After the Seychelles gained independence from Britain in 1976, the new regime demanded costly concessions from Washington to keep the U.S. Air Force tracking station on the archipelago. In response, the United States shifted its space operations from the Seychelles to Diego Garcia, an island that formed part of the Chagos Archipelago then under British control. This arrangement gave Britain leverage to obtain U.S. submarine-launched ballistic missiles at a lower price than what was originally offered. Since Britain already possessed nuclear weapons, hosting U.S. space infrastructure did little to increase the likelihood that the Soviet Union would target the United Kingdom in wartime.

THE VALUE OF UK TERRITORY

Shortly after the space age arrived, British leaders decided to forgo significant investment in satellite capabilities and rely instead on the United States.⁵⁰ But British officials still wanted to carve out a place for the United Kingdom in the national security space arena. In 1963, the Royal Air Force's Fylingdales early warning radar in Yorkshire, which was part of the U.S. Ballistic Missile Early Warning System, came online. Soon thereafter, the UK Ministry of Defence recommended adapting it for satellite tracking, in addition to its primary nuclear mission.⁵¹ (This dual mission underscores the close linkages between space and nuclear infrastructures.) UK defense leaders then suggested using a radar at Malvern in tandem with Fylingdales to collect unique data on Soviet satellites passing overhead. U.S. officials welcomed this proposal, saying that Britain was "well placed geographically for looking at [Soviet satellites] in the first few orbits."⁵² UK defense and intelligence officials saw this collaboration as an opportunity to expand the flow of space-related U.S. intelligence to the

50. "Report of the Space Review Committee," September 1965, DEFE 68/83, UK National Archives (UKNA), London.

51. MoD Defence Research Policy Committee, "Military Satellite Communications," August 22, 1963, AVIA 92/151, UKNA.

52. "BMEWS Fylingdales-Satellite Signature Analysis" July 8, 1964, AIR 20/11559, UKNA.

United Kingdom.⁵³ The UK Air Staff went further, hoping that this situation would lead to “UK/US interdependence in military space.”⁵⁴

Overseas British territories proved to be even more important for hosting space infrastructure that strengthened the U.S.-UK alliance.⁵⁵ By this point, the United Kingdom had permitted the United States to place satellite and missile tracking equipment on Ascension Island in the South Atlantic as well as on Grand Bahama, Grand Turk, Bermuda, and Antigua.⁵⁶ But as U.S. space activities expanded in the early 1960s, both NASA and the Pentagon needed tracking stations in the Indian Ocean to fill gaps in their global networks. To solve this problem, Britain agreed to allow the United States to establish an air force space tracking station on Mahé Island in the Seychelles in 1963, designated the “Indian Ocean Station.”⁵⁷ U.S. officials could not be certain that UK overseas territories would remain under the Union Flag indefinitely. Even with decolonization intensifying, U.S. officials maintained that certain British islands could serve as unsinkable platforms for hosting satellite tracking stations so long as Britain was committed to keeping its hold over them. Buttressing British imperialism thus became a top U.S. foreign policy priority at the same time that U.S. policymakers decried European colonialism.

The U.S. Air Force Indian Ocean Station commander and the British governor diligently cooperated to maintain good relations with the Seychellois population to prevent the facility from becoming a source of ire that could catalyze independence movements. Consequently, U.S. and UK officials agreed that it was prudent for U.S. personnel stationed there to keep a low profile. Only three U.S. Air Force personnel were initially assigned to the facility, accompanied by over a hundred U.S. contractors. And armed forces members were under strict orders to wear civilian clothing in an attempt to soften the U.S. military presence.⁵⁸ The station’s minor role in supporting the 1969 Apollo 11 flight was widely publicized on the island, taking attention away from its military function.⁵⁹ Local residents were unaware that the station was

53. Ibid.

54. “Satellite Information Centre at Fylingdales,” February 18, 1964, AIR 19/1137, UKNA.

55. On the role of space in U.S.-UK defense cooperation, see Aaron Bateman, “Keeping the Technological Edge: The Space Arms Race and Anglo-American Relations in the 1980s,” *Diplomacy & Statecraft*, Vol. 33, No. 2 (2022), pp. 355–378, <https://doi.org/10.1080/09592296.2022.2062130>.

56. “Project: Gemini,” *Press Kit*, Press Release No. 65–158 (Washington, DC: NASA, 1965), p. 41, <https://ntrs.nasa.gov/api/citations/19650013875/downloads/19650013875.pdf>.

57. Jernigan, “Air Force Satellite Control Facility,” p. 40.

58. Letter from A. F. Knight (Atlantic and Indian Ocean Department, FCO) to Sir Bruce Greatbatch (Governor, Seychelles), “U.S. Tracking Station Mahe,” July 1, 1971, FCO 141/1375, UKNA.

59. For a description of Mahé as a “nonmilitary station,” see “World: Seychelles Guns,” *Time*,

tracking the U.S. Air Force's Vela satellites, used to detect nuclear explosions, in the midst of the Apollo 11 mission.⁶⁰

In addition to Mahé, the United States set its sights on Diego Garcia to host an "austere" military communications station.⁶¹ To enable the U.S. basing agenda, in 1965 the United Kingdom created a new political structure called the British Indian Ocean Territory, which grouped together the Chagos Archipelago, Aldabra, Desroches, and Farquhar—the latter three were part of the Seychelles. During this political reshuffling, the United Kingdom detached the Chagos Archipelago from Mauritius and the others from the Seychelles to "minimize substantially or remove the possibility that use of the islands could be hampered by external pressures for self-determination."⁶² To make way for the U.S. base, Britain forcibly resettled approximately 2,000 inhabitants of the Chagos Archipelago to Mauritius at the behest of Washington.⁶³ U.S. officials had insisted that Diego Garcia be depopulated to ensure "exclusive [U.S.] control."⁶⁴ In exchange for this arrangement, the United States provided Polaris submarine-launched ballistic missiles to Britain at a lower cost.⁶⁵ In years to come, the small atoll became host to even more satellite surveillance and command and control facilities, making it

December 25, 1978, <https://time.com/archive/6881481/world-seychelles-guns/>. David Arnold writes that the station commander was likely responsible for the story that Mahé played a role in the Apollo mission. See Arnold, *Spying from Space*, p. 177. During the Apollo 11 mission, the tracking station on Mahé relayed messages from specially equipped NASA aircraft that communicated with the spacecraft on its way to the Moon.

60. Arnold, *Spying from Space*, p. 177.

61. Note from the British Embassy to the Department of State, July 29, 1963, *FRUS, 1961–1963*, Vol. 19, *South Asia*, ed. Louis J. Smith (Washington, DC: GPO, 1996), doc. 312, <https://history.state.gov/historicaldocuments/frus1961-63v19/d312>.

62. Memorandum from the Deputy Assistant Secretary of State for Politico-Military Affairs (Kitchen) to Secretary of State Rusk, "Discussions with the British on Indian Ocean Island Facilities," March 3, 1964, *FRUS, 1964–1968*, Vol. 21, *Near East Region, Arabian Peninsula*, ed. Nina Davis Howland (Washington, DC: GPO, 2000), doc. 34, <https://history.state.gov/historicaldocuments/frus1964-68v21/d34>.

63. Ruth Oldenziel, "Islands: The United States as a Networked Empire," in Gabrielle Hecht, ed., *Entangled Geographies: Empire and Technopolitics in the Global Cold War* (Cambridge, MA: MIT Press, 2011), p. 24. On Diego Garcia and the United States, see David Vine, *Island of Shame: The Secret History of the U.S. Military Base on Diego Garcia* (Princeton, NJ: Princeton University Press, 2011).

64. Memorandum from the Deputy Assistant Secretary of State for Politico-Military Affairs (Kitchen) to Secretary of State Rusk.

65. FCO Defence Department, "General Background," undated, FCO 32/719, UKNA. See also Samuel Bashfield, "'We Will Stay in the Indian Ocean': The British Indian Ocean Territory, 1965–91" (Ph.D. dissertation, Australian National University, 2024), p. 50, <https://hdl.handle.net/1885/733720786>.

one of the most important U.S. space infrastructural locations anywhere in the world.⁶⁶

By the late 1960s, the space race was transforming the Indian Ocean into yet another region of superpower competition. A CIA report observed that “space exploration requirements” were making both the United States and the Soviet Union increasingly active in the area.⁶⁷ To compensate for its lack of island-based tracking facilities, in 1968 the Soviet Union began deploying instrumentation vessels to receive telemetry from its spacecraft that landed in the Indian Ocean. In response, U.S. officials asked the British government for permission to place an 8-foot antenna, operated by U.S. personnel, on Mahé Island to surreptitiously intercept telemetry from Soviet spacecraft that landed in the ocean nearby.⁶⁸

U.S. concerns about the Soviet presence in the region grew when U.S. officials discovered that the Kremlin was eyeing land for a satellite tracking facility in Somalia. CIA analysts noted that the Soviets might consider Somalia “a suitable location, politically as well as technically, for a facility to track and communicate with satellites and space vehicles.”⁶⁹ Aside from the technological advantages from such a facility, U.S. officials feared that Moscow might use it as a launching point for stoking anti-U.S. sentiments in the Indian Ocean. This scenario was especially concerning because the intelligence community warned that the United States would have to cope with “emerging nationalism in the [Indian Ocean] islands” and the “sensitivities of the African and Asian states on the periphery of the ocean toward ‘foreign bases.’”⁷⁰

POLITICAL VULNERABILITY INTENSIFIES

In June 1976, about ten years after this CIA warning, the Seychelles gained independence from the United Kingdom. This was particularly unwelcome news since the United States was preparing to upgrade the U.S. Air Force tracking station on Mahé to be able to receive data from P-989 signals intelligence

66. In 1964, British officials pointed out that Diego Garcia and other Indian Ocean islands would be ideal locations for satellite tracking. See Memorandum for Cabinet, “Diego Garcia,” November 10, 1964, CAB 21/5418, UKNA.

67. Intelligence report, “Power Politics Drift into the Western Indian Ocean,” April 11, 1969, CIA CREST Database, CIA-RDP79-00927A007000040004-9.

68. Cypher telegram, from Secretary of State to Governor of Seychelles, No. 104, March 25, 1968, FCO 141/1375, UKNA.

69. Special memorandum from the Board of National Estimates, “Strategic and Political Interests in the Western Indian Ocean,” No. 3-67, April 11, 1967, CIA CREST Database, DOC_0000886567.

70. Ibid.

satellites used to locate Soviet military forces. The orbit of these satellites brought them on a southerly trajectory over the Soviet Union and then Mahé station, where they “dumped” the data that was intercepted over Soviet territory. From the ground station, the data was rapidly transmitted to analysts in the United States.⁷¹ Without ground stations around the world, including at Mahé, the United States would have been unable to rapidly retrieve and process signals intelligence data that could then be used for precision targeting of Soviet armed forces in wartime.⁷²

This situation deteriorated further when France-Albert René, the leader of the socialist Seychelles People’s United Party, seized power from President James Mancham in a coup. René opposed close relations with the United Kingdom and courted Moscow. But he had to rely heavily on Western tourism and the U.S. Air Force tracking station rent, which accounted for 26 percent and 7 percent, respectively, of Seychelles’ gross domestic product in 1984. There was also substantial anti-Soviet sentiment among the Seychellois population, given the country’s economic ties with the United States.⁷³

THE SEYCHELLES’ LEVERAGE

The United States used economic assistance as a quid pro quo for basing rights. This strategy worked to a degree. By late 1983, the CIA noted the significance of U.S. economic assistance in the René government’s “tilt away from the extreme politics of its first five years.”⁷⁴ This situation, however, came at a high price for Washington. René demanded a substantial increase in rent (from about \$600,000 to \$2.5 million) as a precondition for renewing the lease. He added the caveat that “he would close the station if he found that it was being used for military purposes.”⁷⁵ It is unlikely, however, that René actually

71. *Planned SCF Network Improvements and Related P989 Data Timelines*, January 25, 1978, C05098887, National Reconnaissance Office (NRO) Electronic Reading Room, https://www.nro.gov/Portals/135/documents/foia/declass/SIGINTphaseIII/SC-2017-00004_C05098887.pdf.

72. Recently declassified documents show that during multiple exercises in 1975 and 1976, intelligence analysts used “rapidly-processed satellite [electronic intelligence data] . . . to aid in targeting in the tactical area of interest.” See *Decision Unit Overview: National Reconnaissance Program P-989*, NRO Electronic Reading Room, C05098601, approved for release August 5, 2024 (Chantilly, VA: National Reconnaissance Office, 2024), https://www.nro.gov/Portals/135/documents/foia/declass/SIGINTphaseIII/SC-2017-00004_C05098601.pdf.

73. NIE, “Seychelles: President Rene Strives for Stability,” July 1985, CIA CREST Database, CIA-RDP86T00589R000300320003-7.

74. NIE, “Seychelles: The Mellowing of President Rene,” October 1983, CIA CREST Database, CIA-RDP84S00897R000100070005-6.

75. CIA research paper, “Impact of Soviet Naval Presence in Third World Countries,” January 1983, CIA CREST Database, CIA-RDP84T00658R000100020002-8.

believed that the station had no military purpose. But saying so allowed him to maintain his stated policy of nonalignment and to challenge any claims by the Kremlin that he was hosting the U.S. military while rejecting similar arrangements with Moscow. The high rent for the U.S. Air Force tracking station and political insecurity in the Seychelles underscored the precarity of relying on non-ally partners, a situation that U.S. policymakers had been trying to avoid since the early 1960s.

Washington wanted to avoid a repeat of the Seychelles situation when in the late 1970s the U.S. Air Force planned to field its Ground-Based Electro-Optical Deep Space Surveillance (GEODSS) telescopes at five locations around the world for monitoring high-altitude satellites.⁷⁶ Initially, Washington wanted to place a GEODSS site in Morocco, but the negotiations fell apart when Moroccan King Hassan II made the deal contingent on an arms transfer that U.S. officials thought was problematic.⁷⁷ Not long after, the Pentagon secured an agreement from South Korea to host a GEODSS site that became operational in 1983.⁷⁸ That same year, Portugal, a North Atlantic Treaty Organization (NATO) ally, expressed its willingness to host a GEODSS site, which was a sufficient replacement for the planned site in Morocco. But Lisbon began stalling during the implementation discussions, alleging that the United States was not providing sufficient compensation.⁷⁹ These difficulties left the United States with a gap in its GEODSS network until Spain agreed to host an optical telescope in 1997.⁸⁰ The Portugal case study underscores that even treaty allies can be unreliable.

76. For a description of the Ground-Based Electro-Optical Deep Space Surveillance (GEODSS) network, see "Background," in response to parliamentary question (PQ7209D), February 26, 1987, FCO 31/5023, UKNA.

77. Telegram from the Embassy in Morocco to the Department of State, "Long-Term Planning for US Military Access and Overflights in a Southwest Asian Contingency," January 31, 1980, *FRUS, 1977-1980*, Vol. 27, Part 3, *North Africa*, ed. Myra F. Burton (Washington, DC: Government Printing Office, 2017), doc. 184, <https://history.state.gov/historicaldocuments/frus1977-80v17p3/d184>.

78. This site closed ten years later because of smog, which adversely affected satellite observation, and because of cost. See Jun Ho Lee et al., "Robotic SLODAR Development for Seeing Evaluations at the Bohunsan Observatory," presentation paper, Sixteenth Advanced Maui Optical and Space Technologies Conference, Maui, Hawaii, September 15-18, 2015, <https://amostech.com/TechnicalPapers/2015/Poster/Lee.pdf>.

79. CIA report, "European Review," August 29, 1986, CIA CREST Database, CIA-RDP87T00289R000301170001-7.

80. The United States established sites in Diego Garcia, Hawaii (Maui), New Mexico, and South Korea. Spain briefly hosted a transportable telescope. In addition to terrestrial space surveillance systems, the United States uses space-based sensors to track satellites. On GEODSS, see *A GEODSS Sourcebook: Version of 2008-10-19* (Washington, DC: Federation of American Scientists, 2008), <https://spp.fas.org/military/program/track/geodss.pdf>.

BRITAIN'S LEVERAGE

To monitor high-altitude satellites from the Indian Ocean, the United States turned to its British ally once again. In 1980, London approved a U.S. request to host a GEODSS site on Diego Garcia.⁸¹ This agreement came in the wake of the United States markedly expanding its space infrastructure on the island. In the 1970s, the U.S. Air Force began surveying different parts of Diego Garcia to install antennas for tracking and communicating with defense satellites.⁸² In January 1981, U.S. officials requested permission from the UK to place a NAVSTAR Global Positioning System ground station on Diego Garcia.⁸³ Since NAVSTAR satellites would be used for navigation and precision targeting, basing these stations on politically reliable territory was vital. In exchange for expanded U.S. basing rights, the United States reduced the cost of Britain's acquisition of the U.S. Trident submarine-launched ballistic missile system to upgrade its nuclear deterrent.⁸⁴ London effectively leveraged the United States' requirement to expand its footprint in the Indian Ocean.

As the political situation in the Seychelles and Madagascar deteriorated, Diego Garcia provided a life raft for the U.S. Air Force and NASA tracking stations hosted on these islands. To mitigate the insecurity surrounding the Mahé tracking station, the U.S. Air Force began laying the groundwork to shift space tracking operations to Diego Garcia, which it would complete in 1996.⁸⁵ Diego Garcia would also eventually help to fill the gap in NASA's

81. "Background," in response to parliamentary question (PQ7209D).

82. Message from RNLO Diego Garcia to MoD UK Navy, "Development Plans for Simpson Point Area," "DF-1 Antenna Relocation to Simpson Point, Diego Garcia," January 16, 1981, FCO 31/3036, UKNA.

83. NAVSTAR stands for Navigation System with Timing and Ranging. Memorandum from B. Watkins (Defence) to J. Dobbins (U.S. embassy, London), "Site Surveys for NAVSTAR System," January 8, 1981, FCO 21/336, UKNA; "Site Surveys for NAVSTAR Global Positioning System," January 9, 1981, FCO 21/336, UKNA. U.S. officials stipulated that the antennas in the continental United States, Guam, and the United Kingdom would be sufficient for command and control, and that the others would passively receive data from the satellites about their status.

84. Message from White House to U.S. Embassy Tokyo, enclosing "Eyes Only" memorandum for Senator Robert Byrd from Zbigniew Brzezinski, July 15, 1980, doc. 33, NSA, <https://nsarchive.gwu.edu/document/23825-message-white-house-u-s-embassy-tokyo-enclosing-eyes-only-memorandum-senator-robert>; Department of State, "Notes for Meeting with the Vice President," June 26, 1980, doc. 32, NSA, <https://nsarchive.gwu.edu/document/23824-department-state-notes-meeting-vice-president-circa-26-or-20-june-1980-secret>. For a British perspective on the linkage between Trident and Diego Garcia, see Minute for Prime Minister, "Anglo-American Negotiations on Polaris Replacement," June 13, 1980, PREM 19/417, UKNA. For secondary literature on this subject, see: Bashfield, "We Will Stay in the Indian Ocean," pp. 167–177; Suzanne Doyle, "The United States Sale of Trident to Britain: Deal Making in the Anglo-American Nuclear Relationship," *Diplomacy & Statecraft*, Vol. 28, No. 3 (2017), pp. 477–493, <https://doi.org/10.1080/09592296.2017.1347447>.

85. "21st Space Operations Squadron, Detachment 1—(Diego Garcia Tracking Station)," Peterson

tracking network after the latter abruptly lost its Madagascar tracking station because of a revolution in 1975.⁸⁶ As the only U.S. space infrastructural foothold in the Indian Ocean, Diego Garcia has been a vital interest of the United States and a high-profile issue in the Anglo-American relationship. In 2024, Britain handed over sovereignty of Diego Garcia to Mauritius but also secured an agreement preserving U.S. and UK basing rights for at least another ninety-nine years.⁸⁷

Space Infrastructure and the U.S.-Australia Alliance

To maintain persistent contact with U.S. civilian and military satellites, the United States relied on Australia, its only treaty ally in the Southern Hemisphere with a large landmass, to host U.S. space facilities. A U.S. ground station near Woomera provided the sole data link with U.S. nuclear early warning satellites in the Eastern Hemisphere that watched for signs of a Soviet intercontinental ballistic missile attack. Loss of this facility would have severely degraded the U.S. nuclear early warning system. But Australians worried that their government had insufficient control over the ground station, and that hosting this facility contributed to making Australia a nuclear target. Wary of this situation, some politicians called for the closure of this facility and others like it in Australia. In stark contrast to Britain, Australia never fully used the leverage provided by hosting U.S. space infrastructure.

THE VALUE OF AUSTRALIA'S TERRITORY

The space age emerged shortly after New Zealand, Australia, and the United States became treaty allies in the form of the Australia, New Zealand, and

and Shriever Space Force Base, February 2024, <https://www.petersonschriever.spaceforce.mil/About-Us/Fact-Sheets/Display/Article/3675206/21st-space-operations-squadron-detachment-1-diego-garcia-tracking-station/>.

86. Tsiao, *Read You Loud and Clear!* pp. 213–214. NASA did not immediately move operations to Diego Garcia. In the interim, it used an instrumentation support ship, the USS *Vanguard*, to support various spacecraft. In 1972, the CIA noted that as the political situation in the Malagasy Republic deteriorated, NASA operations could be shifted to Diego Garcia. See intelligence memorandum, “Implications of Madagascar’s Unfinished Revolution,” July 27, 1972, CIA CREST Database, CIA-RDP79R00967A000500020012-5.

87. Benjamin J. Sacks, “The Devil Will Be in the Details: A Formal UK-Mauritius Sovereignty Treaty Could Counter Chinese Ambitions,” RAND, January 21, 2025, <https://www.rand.org/pubs/commentary/2025/01/the-devil-will-be-in-the-details-a-formal-uk-mauritius.html>; Ministry of Defence et al., “UK Secures Future of Vital Diego Garcia Military Base to Protect National Security,” press release, GOV.UK, May 22, 2025, <https://www.gov.uk/government/news/uk-secures-future-of-vital-diego-garcia-military-base-to-protect-national-security>.

United States Security Treaty (ANZUS) in 1951.⁸⁸ In an attempt to bind U.S. security more closely to Australia's, at the 1956 ANZUS council meeting Australian officials offered to host U.S. space and defense facilities.⁸⁹ Since ANZUS did not have a NATO Article 5 equivalent—that an attack on one constitutes an attack on all—Australian policymakers hoped that placing U.S. defense infrastructure on Australian soil would increase the likelihood that the United States would aid Australia in a crisis.⁹⁰ In the words of Desmond Ball, Australia was a “suitable piece of real estate” for the United States.⁹¹ But Australia was more than “suitable”; in some instances, its territory was essential and irreplaceable.⁹² Indeed, there was no other Southern Hemispheric location that offered the same physical security for stations that communicated with and tracked U.S. military and civilian satellites. Australia's geography thus became its political currency in dealings with the United States.

In 1960, NASA paved the way for the United States to significantly expand its presence in Australia when Australia and the United States signed an agreement permitting NASA tracking stations in the country.⁹³ Within a decade, NASA had a presence in Western Australia (Carnarvon), the Australian Capital Territory (Tidbinbilla, Honeysuckle Creek, and Orroral Valley), South

88. For a history of the Australia, New Zealand and United States Security Treaty (ANZUS), see: W. David McIntyre, *Background to the ANZUS Pact: Policy-Making, Strategy, and Diplomacy, 1945–1955* (Christchurch, New Zealand: Canterbury University Press, 1994); Iain D. Henry, *Reliability and Alliance Interdependence: The United States and Its Allies in Asia, 1949–1969* (Ithaca, NY: Cornell University Press, 2022).

89. Draft paper attached to memorandum from the Department of the Navy, “Project Advent,” February 19, 1962, 3044477, NAA. Since the late 1940s, Australia had permitted Britain to use its proving ground at Woomera—a little more than 1,000 miles west of Sydney—for testing missiles and launching rockets. See C. N. Hill, *A Vertical Empire: History of the British Rocketry Programme*, 2nd ed. (London: World Scientific, 2012).

90. In 1955, Australia agreed to permit the United States to construct a facility in Alice Springs for detecting nuclear tests in Eurasia. In 1963, a similar U.S. facility was installed at Royal Australian Air Force Base Amberley in Queensland. See “Joint Geological and Geophysical Research Station Alice Springs” and “Project ‘High Noon’ Amberley,” both undated, 551573, NAA.

91. Ball, *A Suitable Piece of Real Estate*, p. 16.

92. For background on the U.S.-Australian space relationship, see Tristan Moss, *The Space Between Alliance and Self-Reliance: The Evolution of the Australia-U.S. Defence Space Relationship* (Sydney: United States Studies Centre, 2023), <https://www.ussc.edu.au/the-evolution-of-the-australia-us-defence-space-relationship>. See also Tristan Moss, “‘There Are Many Other Things More Important to Us Than Space Research’: The Australian Government and the Dawn of the Space Age, 1956–62,” *Australian Historical Studies*, Vol. 51, No. 4 (2020), pp. 442–458, <https://doi.org/10.1080/1031461X.2020.1766522>.

93. Draft paper attached to memorandum from the Department of the Navy, “Project Advent.” The United States placed tracking stations in Australia before 1960, but a formal agreement was not signed until that year.

Australia (Island Lagoon), and Queensland (Cooby Creek).⁹⁴ Because of its location, the Carnarvon station relayed the command to the Apollo 11 spacecraft that placed it on a lunar trajectory.⁹⁵ Moreover, it was the only NASA facility in the Southern Hemisphere with high-precision FPQ-6 radars that played a key role in accurately tracking NASA space missions.⁹⁶ Australian facilities were largely invisible enablers of the U.S. space program, including its Moon landings.

Publicly, Australian officials presented NASA facilities as Australia's contribution to the peaceful exploration of the cosmos. Internal discussions in Canberra revealed far more pragmatic views about the security rationale for hosting NASA tracking stations. In 1964, John Keith Waller, a senior Australian diplomat, observed that "our main interest in these [NASA tracking stations] was to facilitate the establishment of defense projects in Australia."⁹⁷ An earlier Australian White Paper claimed that the United States viewed NASA facilities in Australia as "virtually indispensable."⁹⁸ These sites were indeed critical for NASA space missions, but they did not translate into stronger security guarantees from Washington.

Even though NASA tracking sites were devoted to civilian space missions, they also supported Department of Defense space projects on an ad hoc basis. In November 1961, NASA informed the Australian government that it sought to use Australia's tracking stations in Woomera to support two Department of Defense projects: Blue Scout Junior (a space launch vehicle),

94. NSSM-204, "U.S. Policy Towards Australia Annex G: NASA Activities," NSC Institutional Files, Senior Review Group Meeting, 8/15/74, Australia (NSSM 204), box 12, Gerald Ford Presidential Library, Ann Arbor, MI, https://www.fordlibrarymuseum.gov/sites/default/files/pdf_documents/library/document/0398/1981991.pdf. The Minitrack station at Woomera moved to Orroral Valley in 1966. For more details on individual sites, see "Orroral Valley Tracking Station," Background Information, ACT Heritage Council, February 2016, https://www.act.gov.au/___data/assets/pdf_file/0003/1274826/orroral-valley-tracking-station-background-information.pdf.

95. Stanley E. Anderson, "ARIA-NAASA's Apollo Airborne Fire Brigade," *Acta Astronautica*, Vol. 187 (October 2021), p. 208, <https://doi.org/10.1016/j.actaastro.2020.11.045>.

96. Statement by the Acting Minister for Supply, the Hon. Malcolm Fraser, "Australian Participation in Apollo-14 Mission," January 29, 1970, Collection 6, Amalgamated Wireless Ltd. Further Records, 1910–1980, State Library of New South Wales, Sydney, Australia.

97. Memorandum from J. K. Waller, "Carnarvon Tracking Station," May 13, 1964, U.S.-Australia Umbrella Agreement for NASA Projects, 1756205, NAA.

98. Letter from R. G. Menzies (Minister for External Affairs) to Secretary of External Affairs, "Project Advent," February 19, 1962, 3044477, NAA. For the U.S.-Australia agreement on space tracking facilities, see "Exchange of Notes Constituting an Agreement Between the Government of Australia and the Government of the United States of America Relating to Space Vehicle Tracking and Communications," Department of External Affairs, Canberra, February 26, 1960, Australian Treaty Series 1960 No. 2, <https://www.austlii.edu.au/au/other/dfat/treaties/ATS/1960/2.html>.

and the Advent military communications satellite program.⁹⁹ On multiple occasions, the Carnarvon tracking station received telemetry from U.S. defense satellites.¹⁰⁰ U.S. officials considered the use of NASA facilities to support defense satellites as only a minor national security role, but these cases once again underscore the fluid boundary between U.S. defense and civilian space infrastructures.¹⁰¹

Even if the benefits of NASA's facilities were nebulous, their non-military status helped to ensure that they did not attract domestic political opposition. The integration of Australians into the operation of NASA's tracking stations garnered positive attention and made them a point of national pride, as depicted in the Australian cult classic film *The Dish*. In stark contrast, Australians were not fully integrated into the highly classified U.S. defense space sites that Australia agreed to host in the mid-to-late 1960s, leading to substantial domestic political controversy.

AUSTRALIAN NUCLEAR ANXIETIES

The influx of Americans into the Australian outback town of Alice Springs in 1966 was conspicuous. Residents soon learned that the United States and Australia were building a "Joint Defense Space Research Facility," more commonly known as Pine Gap.¹⁰² The facility resembled a Hollywood science fiction movie set, as large antennas covered by golf-ball-shaped radomes jutted out from the reddish, Mars-like soil.¹⁰³ Ever since Pine Gap was established, U.S. and Australian officials have been circumspect about its purpose. Australian officials have acknowledged only that it is "a satellite ground station, whose function is to collect intelligence data which supports the national security of both Australia and the US."¹⁰⁴ Initially, Australian officials tried

99. Memorandum from Dept. of Supply to Dept. of External Affairs, "Use of NASA Installations for U.S. Defence Projects," November 27, 1961, 1826936, NAA. The Pentagon cancelled Advent before it was tested, eliminating the need for an Australian station.

100. Memorandum from J. K. Knott to Secretary, Department of External Affairs, "Carnarvon Tracking Station—Additional Equipment," October 27, 1964, U.S.-Australia Umbrella Agreement for NASA Projects, 1756205, NAA.

101. James E. David, *Spies and Shuttles: NASA's Secret Relationships with the DoD and CIA* (Gainesville: University of Florida Press, 2015).

102. Minutes for Cabinet, "Inter-Departmental Committee Report on the Proposed Joint United States/Australian Defence Space Research Facility," October 20, 1966, 3111068, NAA.

103. Stuart W. Leslie, "Under the Radome: The Architecture of American Cold War Surveillance," *Journal of the Society of Architectural Historians, Australia and New Zealand*, Vol. 31, No. 2 (2021), p. 165, <https://doi.org/10.1080/10331867.2021.1945732>.

104. Prime Minister Robert Hawke made this statement in 1988. See Robert Hawke, "Parliamentary Statement by the Prime Minister on the Joint Defence Facilities," Department of the Prime

to maintain the fiction that the facility was used for nonoperational defense scientific research, but the public was unconvinced.¹⁰⁵

Pine Gap quickly became a lightning rod for Australian nuclear anxieties. The secrecy surrounding the facility led the press to speculate that it was used to control secret U.S. military satellites that could make Australia a nuclear target for the Soviet Union.¹⁰⁶ One journalist warned that in the future “tourists may come to gaze in wonderment at a crater named Alice,” after it had presumably been destroyed by a Soviet nuclear attack.¹⁰⁷ Concerns about becoming a nuclear target were not completely unfounded. A 1981 intelligence report for the Cabinet of Australia concluded that Pine Gap and Nurrungar “might be targeted relatively early in a strategic nuclear war.”¹⁰⁸ But without access to relevant Soviet documents, it is impossible to know if and to what extent the Soviet Union considered U.S. facilities in Australia as important targets.

Canberra urgently needed a public diplomacy strategy to address concerns about Pine Gap, but Washington was of little assistance. Senior Australian officials were kept in the dark about the facility’s mission. In the words of Allan Griffith, an adviser to the prime minister, “It is difficult to do a good job [presenting Pine Gap to the public] without knowing the story but we must accept the decisions on this aspect and do the best we can.”¹⁰⁹ In its early years, Pine Gap was a joint operation in name only. According to a 1966 memorandum for the U.S. secretary of state: “Although the [Pine Gap] facility will ostensibly be a joint operation, it will in fact be financed and managed almost entirely by the United States. Australia will supply the land and certain services.”¹¹⁰ The facade of Pine Gap being “joint” was meant to preempt accusa-

Minister and Cabinet, November 22, 1988, PM Transcripts, <https://pmtranscripts.pmc.gov.au/sites/default/files/original/00007438.pdf>.

105. Letter from A. T. Griffith to Bailey, December 6, 1966, 1346113, NAA.

106. Noel Lindblom, “Australia in U.S. Space Spying Project,” *Sydney Morning Herald*, December 13, 1966, 1728424, NAA.

107. Martin Collins, “The Alice Is Now a Little Light on the War Maps of the World,” *Australian*, December 19, 1966, 1728424, NAA.

108. Despite this judgment, the 1981 report maintained that the Soviet Union was unlikely to target Pine Gap and Nurrungar because they were “not an integral part of an offensive strategic nuclear weapons system.” The report’s authors made some questionable assumptions about how a U.S.-Soviet nuclear conflict might unfold. See “A Preliminary Appraisal of the Effects on Australia of a Nuclear War,” 1981, 7584267, NAA, quote at pp. iii–iv.

109. Letter from A. T. Griffith to Bailey.

110. Memorandum from William P. Bundy to the secretary of state, “Request for Authorization to Negotiate and Conclude an Agreement with Australia Concerning the Establishment of a Joint Defense Space Research Facility in Australia,” October 14, 1966, Joint Defense Space Research Facility, Subject Files: Ambassador Henning to Visit of PM Gorton, box 34, RG 59, NARA.

tions that the facility operated without Canberra's oversight, thereby violating Australia's sovereignty.¹¹¹

POLITICAL VULNERABILITIES EMERGE

Pine Gap exacerbated concerns about Australia hosting U.S. defense facilities without having any authority over their activities. In 1963, Australia agreed to permit the United States to construct a naval radio site—later designated the Naval Communications Station Harold E. Holt—on the Northwest Cape for communicating with U.S. ballistic missile submarines and surface vessels. But the agreement contained no provisions for an Australian role in the operations at the facility, which incensed Australian Labor Party politicians. In response, opposition leader Gough Whitlam exclaimed that there should be “no annihilation without representation.”¹¹² He and his colleagues were adamant that Australia must be involved in the facility's operation. This position was neither unreasonable nor unprecedented. The Fylingdales station in Britain that formed part of the U.S. nuclear early warning system was under the command of a UK military officer. But Australian Prime Minister Robert Menzies did not push for any sovereignty guarantees because he wanted the radio station installed as quickly as possible to strengthen the alliance.¹¹³ Members of the Labor Party worried that similar compromises were being made with Pine Gap, and they were correct.

Australian officials hoped that the NASA sites in the country might pacify at least some of the opposition to Pine Gap. Griffith stressed that “the thing to remember is that physically [Pine Gap] will look like Tidbinbilla or any other [NASA] space station.”¹¹⁴ In other words, the non-defense related space infrastructure in Australia could imply that Pine Gap was just like any other space facility in the country. Another adviser to the prime minister echoed Griffith's comments, saying that Pine Gap was “at least on the face of it . . . ‘comparable’ to those facilities at Tidbinbilla and Cooby Creek.”¹¹⁵ But the

111. In some instances, internal Australian government documents referred to the joint facilities as U.S. bases. See letter for the prime minister, “United States Defence Bases,” April 23, 1971, 305377, NAA.

112. House of Representatives Official Hansard, No. 21, May 21, 1963, Twenty-Fourth Parliament, First Session—Third Period, https://www.aph.gov.au/Parliamentary_Business/Hansard.

113. Letter to Mr. Griffith, “V.L.F. Station—Australian Sovereignty,” undated (likely 1963), 762622, NAA.

114. Memorandum from Bailey to the secretary, “Alice Springs,” December 7, 1966, 1346113, NAA.

115. *Ibid.*

secrecy and physical security surrounding Pine Gap suggested that it had a different purpose.

These complexities become more acute in the late 1960s, when the United States began to search for a place to host a ground station for its first Defense Support Program (DSP) nuclear early warning satellites.¹¹⁶ The initial DSP satellites were placed into a geosynchronous orbit—a little more than 22,000 miles above the Earth. At this altitude a satellite moves with the rotation of the Earth and can stare at approximately one-third of the globe.¹¹⁷ The Pentagon decided to deploy the first DSP satellite in the Eastern Hemisphere so that it could continuously monitor Soviet and Chinese missile bases. But doing so required a ground station somewhere in the satellite's footprint to receive data from the DSP satellite sensors, process it, and then relay it to end users in the United States.¹¹⁸ Initially, the data was sent to the United States using the Commonwealth Pacific submarine cable, and subsequently using satellite communications as well.¹¹⁹ Before settling on Australia, U.S. officials considered other locations, including Diego Garcia and Guam.¹²⁰ Ultimately, however, the U.S. Air Force set its sights on Woomera, a proving ground north of Adelaide in South Australia that had long been used for weapons testing. The Air Force preferred this spot because it was far from the Soviet Union and free from radio frequency interference.¹²¹

Political opposition arose immediately after Prime Minister John Gorton informed Parliament in April 1969 that his government had accepted a U.S. proposal to install a "defense space communications facility" near Woomera.¹²²

116. Note No. 255, November 10, 1969, September 16, 1970, U.S. Projects in Australia—Joint Defence Space Communications Stations Woomera, 694/7/56/1 part 4, 1756895, NAA.

117. Richelson, *America's Space Sentinels*, pp. 63–68.

118. Background paper, "Defense Space Communications Station," attached to scope paper, "Visit of John Gorton Prime Minister of Australia May 6–7, 1969," March 12, 1969, Subject Files: Ambassador Henning to Visit of PM Gorton, box 34, RG 59, NARA.

119. Ibid. On satellite communications at Nurrungar, see Memorandum for the Secretary of Defence (Australia), "JDSCS Nurrungar: Communications Diversity," August 17, 1971, 1756878, NAA. On the use of submarine cables for relaying nuclear data, see Aaron Bateman, "The Weakest Link: The Vulnerability of U.S. and Allied Information Networks in the Nuclear Age," *Journal of Strategic Studies*, Vol. 48, No. 1 (2025), pp. 156–185, <https://doi.org/10.1080/01402390.2024.2360724>.

120. Richelson, *America's Space Sentinels*, p. 50.

121. John L. McCluskey, Kenneth J. Alnwick, and Lawrence R. Benson, *Reflections of a Technocrat: Managing Defense, Air, and Space Programs During the Cold War* (Montgomery, AL: Air University Press, 2006), p. 198, <https://apps.dtic.mil/sti/citations/ADA456851>. The survey team arrived in May 1969. See Memorandum for the Defence Secretary, "Joint Defence Space Communications Facility Woomera," May 6, 1969, 1756890, NAA.

122. Ministerial Statement, "United States–Australian Defense Space Communications Facility," April 23, 1969, 11602776, NAA.

Despite the facility's innocuous description, Labor politicians suspected that Australia was becoming further entangled in the U.S. nuclear war machine. Kim Beazley, a Labor politician, argued that Australians had a right to know whether hosting the base increased the likelihood that Australia would be pulled into a superpower war. Clyde Cameron, another Labor politician, rejected the U.S. proposal on the grounds that it "earmarks us to be wiped out by a nuclear bomb."¹²³

U.S. officials watched these proceedings closely. If Canberra reversed its decision to permit the installation of a DSP ground station near Woomera, the United States could select another site in the Pacific region or Indian Ocean. But no other location offered the outback's physical security. It would be difficult to convince Australians that hosting U.S. military space facilities made them safer since it increased the likelihood of Australia becoming a Soviet target. U.S. officials therefore had to face the reality that along with the security of Australian geography came political precarity. Nevertheless, Washington believed that the situation was manageable. Ultimately, however, Australian domestic politics became the most significant liability for the security of tenure of U.S. facilities in Australia.

LEVERAGING GEOGRAPHY FOR SECURITY

In 1969, Gorton argued that Australia should host the proposed ground station because doing so would contribute to ANZUS and bind the United States and Australia more closely.¹²⁴ The changing political situation in Asia was a motivating factor for the prime minister. Britain had just announced its plans to withdraw its forces east of Suez, and in 1964 China had entered the nuclear club. In these circumstances, Gorton feared that U.S. retrenchment in Asia might lead to pre-World War II isolationism.¹²⁵ To safeguard Australian interests, Gorton wanted to procure the bomb, but Australia's signing of the Treaty on the Non-Proliferation of Nuclear Weapons in 1968 crushed his nuclear

123. Parliamentary debate, April 29, 1969, 11602776, NAA.

124. Ibid.

125. Jim Walsh, "Surprise Down Under: The Secret History of Australia's Nuclear Ambitions," *Nonproliferation Review*, Vol. 5, No. 1 (1997), p. 9, <https://doi.org/10.1080/10736709708436690>. For the Cabinet decision, see Cabinet Decision No. 964, "United States/Australia Defence Space Communications Station-Woomera," April 23, 1969, 3196973, NAA. Notably, Australian officials mistakenly believed that the facility might have a short life (no more than ten years) because technological improvements would obviate the need for an Australian ground station. For background on the UK withdrawal east of Suez, see Will D. James, "Global Britain's Strategic Problem East of Suez," *European Journal of International Security*, Vol. 6, No. 2 (May 2021), p. 180, <https://doi.org/10.1017/eis.2020.24>.

aspirations. Becoming involved in U.S. nuclear command and control by hosting a DSP ground station (in addition to the Harold Holt naval radio station) provided a second-best option to an independent deterrent.¹²⁶

It was difficult for Australia to identify the tangible benefits of the ground station, especially since DSP data received in Australia would be used to warn of an attack against North America. Consequently, the Treasury questioned why Australia would accede to Washington's request that Canberra contribute about half the facility's cost. Minister of Defence Allen Fairhall believed this to be a shortsighted approach. Geography, in his view, was the main card that Australia held in its relationship with the United States. Hosting the ground station would, Fairhall argued, make the United States more "committed to our protection."¹²⁷ Moreover, the ground station was inextricably linked to the U.S.-Australia intelligence partnership. DSP satellites collected technical data on Soviet and Chinese weapons tests that Canberra would receive "in real time or regularly as intelligence information."¹²⁸ This new stream of intelligence was of indirect value to Canberra, but the facility would make Australia's infrastructure more important to U.S. intelligence, and to the "Five Eyes" by extension.¹²⁹

From the outset, Australia wanted joint control over the ground station. Australian officials agreed that "Australian participation should not be a token presence to preserve a face of jointness."¹³⁰ But this is precisely what occurred. Australia allowed the facility to be placed under the command of the U.S. Air Force with only one senior Australian defense representative onsite.¹³¹ Initially, there were about 70 Australian personnel and more than 300 American personnel.¹³² Moreover, the implementing agreement did not

126. Jacques E. C. Hymans, "Isotopes and Identity: Australia and the Nuclear Weapons Option, 1949–1999," *Nonproliferation Review*, Vol. 7, No. 1 (2000), p. 9, <https://doi.org/10.1080/10736700008436791>.

127. Letter to the prime minister from Allen Fairhall, undated (likely mid-August 1969), 3196973, NAA.

128. Memorandum for Cabinet, "Joint United States/Australian Defence Space Communications Station," July 30, 1969, 3196973, NAA.

129. John Blaxland and Clare Birgin, *Revealing Secrets: An Unofficial History of Australian Signals Intelligence and the Advent of Cyber* (Sydney: UNSW Press, 2023), pp. 275–280. "Five Eyes" refers to the intelligence partnership between Australia, Canada, New Zealand, the United Kingdom, and the United States.

130. "Joint United States/Australia Defence Space Communications Station," undated (likely summer 1969), 1756887, NAA.

131. Draft, "Implementing Agreement Between the United States Air Force and the Australian Department of Defence Concerning the Joint Defence Space Communications Station at Woomera," September 26, 1969, 11602776, NAA.

132. On Australian personnel at Nurrungar, see "Supplement No. 3," March 4, 1971, 11602780,

guarantee Australia any say over operational decisions.¹³³ The Cabinet overlooked these issues for the sake of the alliance.¹³⁴ In 1969, Australia and the United States formally signed an agreement establishing the facility, officially designated as the Joint Defense Space Communications Station but colloquially known as Nurrungar.¹³⁵ The site's official name reinforced its cover story as an Earth station for U.S. military communications satellites.¹³⁶

SECRECY AND SOVEREIGNTY

Pine Gap and Nurrungar provided more fodder for the Labor politicians who believed that their political opponents had agreed to violate Australia's sovereignty by hosting U.S. defense installations. Anticipating that Nurrungar could become a contentious domestic issue, Secretary of the Air Force John McLucas warned Secretary of Defense Melvin Laird in 1971 that the United States should "not remain permanently dependent on ground stations [in Australia] for our space [and nuclear] activities."¹³⁷ But there was no alternative to Nurrungar that met U.S. security requirements.

The secrecy surrounding Nurrungar quickly became a significant liability for the United States. In contrast to their disclosing the mission of the Harold Holt naval radio station, the United States and Australia remained tight-lipped about Pine Gap and Nurrungar. These three sites became known as the "joint facilities."¹³⁸ In April 1969, officials in Canberra sought a "liberal release" of information about Nurrungar in an attempt to be more forthcoming about its mission. U.S. policymakers rejected this proposal. The matter was closely considered during a meeting attended by Deputy Undersecretary of State U. Alexis Johnson, Deputy Secretary of Defense David Packard, and Undersecretary of Defense for Research and Engineering John Foster Jr. They

NAA. On U.S. personnel, see Enclosure attached to a letter from Arthur Rosen (U.S. Embassy in Canberra) to P. G. F. Henderson (Department of External Affairs), September 16, 1970, 1756895, NAA.

133. Draft, "Implementing Agreement Between the United States Air Force and the Australian Department of Defence Concerning the Joint Defence Space Communications Station at Woomera."

134. "Joint United States/Australia Defence Space Communications Station."

135. Note No. 255.

136. "Joint Defence Space Communications Facility Woomera," May 30, 1969, 11602776, NAA.

137. McLucas, Alnwick, and Benson, *Reflections of a Technocrat*, p. 198.

138. On the politics of the joint facilities, see: Ball, *A Suitable Piece of Real Estate*; Ball, *A Base for Debate*; Richelson, *America's Space Sentinels*.

agreed not to divulge any details about the satellite ground station's true purpose because doing so would "give the Russians an unearned bonus."¹³⁹

Even though Australian officials could point to news reporting that speculated about Nurrungar's true purpose, their U.S. colleagues were intransigent. According to the U.S. logic, the Soviets could only consider the facility a "major suspect spot."¹⁴⁰ Rather than officially confirm what was taking place, they believed that it was "in the national interest [to keep] the secret as long as possible."¹⁴¹ In a May 1969 speech to the Australian House of Representatives, Gorton defended the secrecy, saying that releasing more information would impair the site's mission by confirming its "true purpose."¹⁴² He therefore admitted that its mission extended beyond satellite communications. News coverage about the facility's nuclear mission continued and further fueled opposition to Nurrungar and Pine Gap.¹⁴³ Consequently, the U.S. State Department naively concluded that giving a classified briefing about Nurrungar to members of the Australian opposition might help them see its value for Australian security and quell resistance to the facility.¹⁴⁴

Rather than inform Gorton of this State Department idea, the U.S. Embassy in Australia went behind his back and contacted the Department of External Affairs about briefing the opposition. When Gorton discovered this communication, he summoned U.S. Ambassador Walter Rice and reprimanded him about interfering in what Gorton viewed as a "purely [domestic] political matter."¹⁴⁵ In Gorton's words, "The Australian government [was] capable of making better judgments on these matters than the State Department."¹⁴⁶ Before Rice left, Gorton warned him that any further suggestions from U.S. public servants about managing the government's relationship with the opposition would be tossed "into the wastebasket."¹⁴⁷ Despite Gorton's negative reaction, selectively briefing opposition leaders about the joint facilities became common practice.¹⁴⁸

139. Revised minutes from J. Plimsoll to Mr. Hewitt, "Woomera Project," March 4, 1970, 4982139, NAA.

140. *Ibid.*

141. *Ibid.*

142. *Ibid.*

143. Memorandum, "Article in 'Aerospace Daily' on 5 January, 1970," undated, 4982139, NAA.

144. "Record of Discussions with Mr. Rice, U.S. Ambassador to Australia," March 16, 1970, Personal Papers of Prime Minister Gorton, 4982139, NAA.

145. *Ibid.*

146. *Ibid.*

147. *Ibid.*

148. Letter from D. J. Killen to W. G. Hayden, May 19, 1977, 1756854, NAA.

WHITLAM AND THE RISK OF EXPULSION

The future of the joint facilities was called into question when their most outspoken critic, Whitlam, became prime minister in 1972. After receiving briefings on the joint facilities, his attitude seemed to have shifted when he described them as helping “to remove the specter of nuclear war from the face of the earth” and stressed their defensive purpose.¹⁴⁹ Yet U.S. officials knew that Whitlam viewed the U.S. defense presence unfavorably. According to a White House study on U.S. relations with Australia, “Whitlam himself would prefer to see the eventual departure of the U.S. installations.”¹⁵⁰ Whitlam did not oppose the U.S.-Australia alliance.¹⁵¹ Rather, he believed that Australia should maintain its close ties with the United States but not subordinate its interests to Washington’s. Walking this fine line would not be easy. President Richard Nixon already disliked Whitlam because of his criticisms of U.S. policies in Vietnam.¹⁵²

To protect U.S. interests, Nixon appointed Marshall Green as his ambassador to Australia. During a 1973 meeting with National Security Advisor Henry Kissinger, Green stressed that preserving the joint facilities in the country was the top U.S. priority.¹⁵³ The United States needed to extract a guarantee from Whitlam to keep the joint facilities in place before the Pine Gap and Nurrungar agreements were due for review in 1975 and 1978, respectively.¹⁵⁴ To prepare for the worst case scenario, the U.S. Intelligence Board considered “the possible relocation of two [U.S.] projects [in Australia] on the assumption that we might be asked out,” presumably in reference to Pine Gap and Nurrungar.¹⁵⁵

Kissinger was puzzled by Whitlam’s attitude. He asked Green, “Don’t

149. “Extract from the Prime Minister’s Speech to the General Assembly of Victorian Branch of the ALP,” March 25, 1973, Department of the Prime Minister and Cabinet, 8843441, NAA.

150. “U.S. Policy Towards Australia: Political Situation and Prospects,” NSC Institutional Files, Senior Review Group Meeting, 8/15/74, Annex A, Australia (NSSM 204), box 12, Gerald Ford Presidential Library, https://www.fordlibrarymuseum.gov/sites/default/files/pdf_documents/library/document/0398/1981992.pdf.

151. Gyngell, *Fear of Abandonment*, pp. 132–133.

152. *Ibid.*

153. Memorandum of Conversation, Washington, July 28, 1973, 12:30 p.m., July 28, 1973, *FRUS*, 1969–1976, Vol. E-12, *Documents on East and Southeast Asia, 1973–1976*, ed. Bradley Lynn Coleman, David Goldman, and David Nickles (Washington, DC: GPO, 2010), doc. 36, <https://history.state.gov/historicaldocuments/frus1969-76ve12/d36>.

154. Gyngell, *Fear of Abandonment*, p. 134.

155. Minutes of the Acting Secretary of State’s Staff Meeting, Washington, June 14, 1974, 3:10 p.m., *FRUS*, 1969–1976, Vol. E-12, doc. 48, <https://history.state.gov/historicaldocuments/frus1969-76ve12/d48>.

Australian interests make it more necessary for them to be on good terms with us than for us to be on good terms with them?"¹⁵⁶ Kissinger did not seem to grasp Australia's leverage. A 1974 White House study pointed to the singular importance of Nurrungar, stressing that it was "the only ground station link to missile warning and nuclear event detection satellites observing Soviet and PRC ICBM [intercontinental ballistic missile] . . . and nuclear test areas." It was indeed feasible to relocate the station to other locations in the Pacific, but only Australia provided the necessary security from "hostile electronic interference by shipborne equipment."¹⁵⁷ In a place like Guam, Soviet vessels could have used shipborne equipment to electronically jam the data links coming from DSP satellites. Security risks aside, it would take twelve to twenty-four months to complete such a move, which would also have been very expensive.¹⁵⁸ Defense officials warned that losing Nurrungar for any period would "seriously degrade" U.S. warning against Soviet and Chinese intercontinental ballistic missiles and submarine-launched ballistic missiles.¹⁵⁹ In other words, Nurrungar was a cog in the U.S. nuclear command and control machine that the White House could not afford to lose.¹⁶⁰

To combat the narrative that the joint facilities violated Australia's sovereignty, in January 1974 the United States and Australia amended the agreement concerning the Harold Holt radio facility on the Northwest Cape used for communicating with ballistic missile submarines. Washington agreed to allow an Australian military officer as the station's deputy commander and to hold consultations every sixteen to eighteen months on a range of strategic issues. Although it is not explicitly stated in the archival record, these consultations resembled an extended deterrence dialogue.¹⁶¹ After Nixon resigned

156. Memorandum of Conversation, Washington, July 28, 1973.

157. See Sub-Annex I to Annex F: "U.S. Military Facilities in Australia, U.S. Policy Towards Australia: Political Situation and Prospects," NSC Institutional Files, Senior Review Group Meeting, August 15, 1974, Australia (NSSM 204), box 12, Gerald Ford Presidential Library, https://www.fordlibrarymuseum.gov/sites/default/files/pdf_documents/library/document/0398/1981991.pdf.

158. Defense officials noted that an interim capability could be established within about six months by converting a satellite tracking facility on Guam. See *ibid*.

159. *Ibid*.

160. In the 1970s, U.S. officials began to use the Defense Support Program for tactical applications in addition to its primary function as a nuclear early warning system. See "Air Force Space and Missile Systems Center, Synthesis of 'Preliminary Analysis of the Project Hot Spot IR Signals,' December 7, 1973, and 'Applications of Infrared Tactical Surveillance,' May 29, 1975," Electronic Briefing Book No. 235, NSA, doc. 11, <https://nsarchive2.gwu.edu/NSAEBB/NSAEBB235/11.pdf>.

161. "Northwest Cape Consultations: Visit to Washington by Mr. W. B. Pritchett, Rear Admiral AM Synnot and Mr. B. A. Jockel," March 24, 1976, 1728407, NAA.

in the wake of the Watergate scandal, Gerald Ford's administration agreed to a new operational structure at Pine Gap and Nurrungar. At both facilities, Australians became more involved in technical operations.¹⁶² Whitlam reassured Australian citizens that the facilities operated with Canberra's "full knowledge and concurrence," though he would later backtrack on this statement.¹⁶³

MANAGING POLITICAL VULNERABILITY

New challenges for the joint facilities and U.S.-Australian relations arose in the 1980s. Some U.S. observers might have been alarmed to see Labor Prime Minister Robert "Bob" Hawke come to power in 1983, but he in no way signaled a return to the difficulties associated with the Whitlam years. CIA analysts characterized Hawke as a moderate who supported ANZUS.¹⁶⁴ Australian Foreign Minister Gareth Evans said he was "nothing if not consistent in his passionate support for all things American," which included the joint facilities.¹⁶⁵ But Hawke had his work cut out for him. Anti-nuclear sentiments were on the rise everywhere, including in Australia. In 1983, in solidarity with movements in the Northern Hemisphere, more than 700 women set up a "peace camp" near Pine Gap to protest the U.S. facility and raise awareness about the risks of nuclear war.¹⁶⁶ Many people within Hawke's own party feared nuclear war and thus still harbored negative views of the joint facilities.¹⁶⁷ Soviet propaganda stoked those fears by claiming that the joint facilities would be part of Ronald Reagan's controversial Strategic Defense

162. Draft public statement, "Pine Gap Facility," 8861340, NAA. A declassified 1990 U.S. Air Force background paper on Nurrungar noted that "operations of mixed U.S.-Australian crews at Woomera had, in fact, given Australian crew members full access to station operations for many years." See "Air Force Space Command, *History of Air Force Space Command, January–December 1990*, n.d.," Electronic Briefing Book No. 235, NSA, doc. 26, <https://nsarchive2.gwu.edu/NSAEBB/NSAEBB235/20130108.html>.

163. Letter from W. B. Pritchett to PMD, May 19, 1977, 7917615, NAA. According to a 1973 Department of Defence paper, "The Americans were receptive to Australian proposal for closer consultations on nuclear and strategic questions . . . because of the presence of joint facilities in Australia." For details, see Department of Defence paper, "United States Defence Installations in Australia," July 1973, 1756774, NAA.

164. NIE, "Australia's Labor Party: Implications of an Election Victory," February 1983, CIA CREST Database, C05151172.

165. Quoted in Gyngell, *Fear of Abandonment*, p. 177.

166. "Hundreds Attend Pine Gap 'Women's Peace Camp' in 1983," ABC News, December 21, 2017, <https://www.abc.net.au/news/2017-12-21/hundreds-attend-pine-gap-womens-peace-camp-in-1983/9260168>.

167. Gyngell, *Fear of Abandonment*, p. 177.

Initiative (SDI).¹⁶⁸ The White House assured the prime minister that the joint facilities would not be connected to SDI.¹⁶⁹

Australia urgently needed a public diplomacy campaign about the importance of the joint facilities. In a June 1984 speech to parliament, Hawke noted that it was unrealistic to conclude that Australia would be untouched if a nuclear war were to break out, even though the country was located far from where a nuclear war might be fought. The joint facilities, he maintained, contributed to deterrence and thus helped to prevent the horrors of nuclear war. Although the speech lacked substantive technical details about the joint facilities, the prime minister acknowledged that the facilities would play a role in nuclear early warning. Consequently, the joint facilities were “very high priority nuclear targets.” But the benefits outweighed the risks, he argued, stressing that “Australians cannot claim the full protection of that deterrence without being willing to make some contribution to its effectiveness.”¹⁷⁰ In other words, to guard against a perception that Australia was free riding, it was necessary for it to help carry out the missions of the joint facilities in order to contribute to the alliance.

THE LIMITS OF LEVERAGE

Hawke was unwilling to use the joint facilities as leverage in Australia’s relationship with the United States. In the mid-1980s, U.S. subsidies, especially for selling excess U.S. wheat to the Soviet Union, became a point of tension between Washington and Canberra because the Soviet Union was one of the main consumers of Australian wheat. Bill Hayden, minister for foreign affairs and trade, argued that Australia should use the joint facilities as a bargaining chip to get the United States to lift its subsidies, but Hawke refused to do so.¹⁷¹ This trade imbroglio coincided with New Zealand’s decision to block U.S. warships carrying nuclear weapons from its ports, leading the United States to suspend its treaty obligations to New Zealand.¹⁷² Hawke’s ratio-

168. Defense Research Assessment, “The Soviet Active Measures Campaign Against the Strategic Defense Initiative,” June 1, 1986, SDI-Active Measures, October 1986, Kraemer Files, RAC box 70, Ronald Reagan Presidential Library, Simi Valley, CA.

169. “Strategic Defense Initiative: Australian Involvement,” March 27, 1985, 1755950, NAA.

170. “Statement to the Parliament by the Prime Minister: Arms Control, Disarmament, and Australia,” June 6, 1984, PM Transcripts, <https://pmtranscripts.pmc.gov.au/sites/default/files/original/00006409.pdf>.

171. “Air Force Space Command.”

172. “U.S. Policy on the New Zealand Port Access Issue,” October 21, 1985, National Security Decision Directive No. 193, National Security Council, RRPL, <https://www.reaganlibrary.gov/public/archives/reference/scanned-nsdds/nsdd193.pdf>.

nale for refusing is unclear, but he likely believed that using the joint facilities in such a manner would unnecessarily harm the alliance at an especially sensitive moment for ANZUS.

The Hawke government's 1987 Defence White Paper—the first one since 1976—further stressed the vital role of the joint facilities in protecting U.S. and Australian national interests.¹⁷³ The CIA reported that the White Paper reflected the Labor government's opposition to any "leftist effort" to have the facilities expelled from the country.¹⁷⁴ The timing of the White Paper's release was particularly important, given that the Nurrungar agreement was up for review in 1988. But any U.S. hopes that the positive tone of the White Paper marked an end to the controversy over the joint facilities were quickly dashed. Right after the White Paper's release, Ball, one of the most vocal critics of the joint facilities, published a book entitled *A Base for Debate: The U.S. Satellite Ground Station at Nurrungar*. In it, he alleges that Australian officials did not exercise sufficient oversight of its operations. Right after the book's release, Minister of Defence Kim Beazley appeared on national television to defend the joint facilities.¹⁷⁵

Canberra signaled to Washington its firm desire to keep the joint facilities in place, but it also pressed to modify Australia's involvement in their operations. According to Beazley, around this time there were "technical changes at the joint facilities, the significance of which meant the United States wanted enhanced security of tenure."¹⁷⁶ In return, Beazley sought "to put flesh on the bones" of Australia's requirement to have full knowledge and concurrence about their missions.¹⁷⁷ Greater transparency was part of this effort. To this end, in 1988 Hawke disclosed that the percentage of Australian personnel at Pine Gap and Nurrungar would increase to over 30 and 40 percent, respectively. He also explained that Pine Gap housed a "satellite ground station

173. Department of Defence, *The Defence of Australia: A Policy Information Paper* (Sydney: Parliament of the Commonwealth of Australia, 1987), <https://www.defence.gov.au/sites/default/files/2021-08/wpaper1987.pdf>.

174. "National Intelligence Daily," February 13, 1987, CIA CREST Database, CIA-RDP88T00091R000400020008-4.

175. "Air Force Space Command."

176. It is not precisely clear what these "technical changes" entailed. A declassified U.S. Air Force document details technical upgrades to some of the hardware and software at Nurrungar in 1988—called the "Peripheral Upgrade Program"—but no further details are provided and there are no declassified records available concerning any changes at Pine Gap. See "History of Air Force Space Command," January–December 1987, Electronic Briefing Book No. 235, National Security Archive, doc. 18, <https://nsarchive2.gwu.edu/NSAEBB/NSAEBB235/18.pdf>.

177. Kim Beazley, "Operation Sandglass: Old History, Contemporary Lessons," *Security Challenges*, Vol. 4, No. 3 (Spring 2008), p. 31, <https://www.jstor.org/stable/26459189>.

whose function is to collect intelligence,” and that Nurrungar personnel operated a ground station for DSP nuclear early warning satellites.¹⁷⁸ In continuity with his 1984 statement to parliament, he stressed that the joint facilities reduced the specter of nuclear war through deterrence. According to a declassified U.S. government history, Hawke’s statement “was more than the U.S. wanted him to say but was received with relatively good graces in view of his strong support for the joint effort.”¹⁷⁹

As part of the changes that Hawke ushered in, the United States agreed to allow an Australian national as the deputy station commander at Nurrungar to strengthen the “jointness” of the operation. But Canberra wanted more.¹⁸⁰ The Australian Department of Defence insisted that the Australian deputy commander at Nurrungar be permitted to command the facility in the U.S. commander’s absence. Doing so entailed allowing a foreign national to be in charge of a U.S. nuclear command and control facility. Senior officials at U.S. Air Force Space Command supported Australia’s position, pointing out that “exceptions to stated policies had been made over the years for allies with whom the US enjoyed a special relationship . . . [Air Force Space Command] believed that a similar special relationship should be recognized with Australia.” Air Force leaders noted that since 1988 the Australian deputy commander had possessed de facto control of the station when the U.S. commander was away, but Canberra wanted the United States to formally recognize this arrangement. Ultimately, the Pentagon agreed to permit the Australian deputy commander to take control of Nurrungar in the absence of the U.S. commander, with the caveat that “no such agreement would exist in writing.”¹⁸¹ Formality aside, this represented a significant step forward in Australia’s efforts to play a more substantial part in the joint facilities.

THE LIMITS OF FULL KNOWLEDGE AND CONCURRENCE

NASA’s new missions at its Australian facilities complicated discussions concerning Canberra’s full knowledge and concurrence about U.S. space activities in Australia’s territory. This situation stemmed from Washington’s use

178. Hawke, “Parliamentary Statement by the Prime Minister.”

179. Thomas R. Johnson, *American Cryptology During the Cold War, 1945–1989*, Book 4, *Cryptologic Rebirth, 1981–1989* (Annapolis Junction, MD: Center for Cryptologic History, National Security Agency, 1999), p. 302, <https://www.archives.gov/files/declassification/iscap/pdf/2016-220-pt-1-release-material-completed.pdf>.

180. “Col. Glenn P. Doss, Air Force Space Command, *Subject: Deputy Commander (Woomera) Controversy*,” April 20, 1990, Electronic Briefing Book No. 235, NSA, doc. 20, <https://nsarchive2.gwu.edu/NSAEBB/NSAEBB235/20.pdf>.

181. “Air Force Space Command.”

of the shuttle, beginning in 1981, to carry both civilian and military satellites into orbit. Senior Australian officials insisted on receiving details about classified shuttle missions that they might be called on to support. Minister for Science Barry Jones warned the Cabinet that lack of knowledge about classified shuttle missions that involved NASA Australian facilities would “likely attract considerable domestic criticism” with the potential to “generate increasing criticism of Australia’s hosting of the joint defense facilities.”¹⁸² U.S. leaders disagreed, saying that NASA’s Australian tracking stations would have a very limited role in shuttle operations. The United States therefore did not need to disclose any details about classified payloads “apart from those [satellites such as DSP] in which [Australia] cooperate[s] with the US on the joint defense facilities.”¹⁸³

Hosting dual-use NASA facilities provided a litmus test for the comprehensiveness of the full knowledge and concurrence principle. Some officials in the Department of External Affairs worried that a “relaxed approach . . . could be misconstrued by the Americans as implying that we do not really require ‘full knowledge’ of their operations . . . including at the joint facilities.”¹⁸⁴ U.S. Secretary of Defense Caspar Weinberger was unsympathetic to Australian concerns, remaining “firm in this view” that the United States would not share any more information with Australia.¹⁸⁵ To prevent an impasse, Alan Wrigley, an Australian defense official, recommended making the requirement of full knowledge and concurrence “less [stringent] than we do in the case of the joint defense facilities—where our cooperation is directly associated with U.S. defense activity” (emphasis in original).¹⁸⁶

For Australia, the principle of full knowledge and concurrence was malleable and heavily shaped by alliance politics. Australian officials observed that any reversal of NASA basing rights “would need to explore the effect on alliance relations.”¹⁸⁷ Since the NASA discussions took place around the same time as the U.S.-Australian talks about renewing the agreements

182. Memorandum from Barry O. Jones to Cabinet, “Australian Support to the NASA Space Shuttle Carrying US Department of Defence Payloads,” 1755950, NAA.

183. Memorandum from A. K. Wrigley (Defence), “Australia/United States Cooperation on the NASA Facilities,” June 20, 1983, 175590, NAA.

184. Ministerial submission from R. J. Percival (International Security and Policy Planning Branch), “NASA Proposal to Locate TDRS Equipment at Tidbinbilla,” August 17, 1984, 175590, NAA.

185. Memorandum from A. K. Wrigley (Defence).

186. *Ibid.* The NASA issues involved more than the shuttle but are beyond the scope of this article. For details, see *ibid.*

187. Letter from A. I. C. Pratt (Defence) to Secretary, Department of Science, “Australian Support to NASA Shuttle Vehicles,” September 19, 1986, 8266882, NAA.

governing the joint facilities, it is possible that Canberra decided that pushing for more information on NASA facilities in Australia was an unnecessary distraction from the more pressing issues associated with oversight of Pine Gap and Nurrungar.

Even more importantly, these discussions occurred amid the ANZUS difficulties that stemmed from New Zealand prohibiting nuclear-armed U.S. ships from visiting its ports. In this context, Hawke sought to protect the alliance with the United States, as New Zealand was pursuing a more independent foreign policy. Australia thus adopted a flexible approach to full knowledge and concurrence for the sake of its relationship with the United States. It was helpful to Canberra that NASA was primarily a civilian space agency whose activities in Australia were less likely to generate controversy. Regardless, the NASA talks in the 1980s underscore once again the inseparability of civil space infrastructure from the broader U.S.-Australia alliance and some of the political challenges associated with hosting dual-use satellite ground stations in foreign territories.

Conclusion

A comprehensive 1988 U.S. Air Force space policy review concluded that “spacepower will be as decisive in future combat as airpower is today,” and that space technologies had to be integrated “throughout the full spectrum of Air Force capabilities.”¹⁸⁸ Noticeably absent from this memorandum was any mention of the ground stations worldwide that were necessary to make this vision a reality. The robust U.S. global network of satellite tracking and surveillance facilities helped skew the superpower military balance in the United States’ favor. These sites allowed the United States to rapidly move data from satellites to users around the world. Terrestrial infrastructure constituted the proverbial long pole in the tent that enabled all U.S. space operations. Fundamentally, U.S. global space power was (and remains) anchored to terrestrial geography.

The United States quickly learned that basing space infrastructure in foreign lands was a source of vulnerability. Coups and changing political conditions could prompt governments to expel U.S. space facilities with little

188. “Air Force Space Policy—Information Memorandum,” December 2, 1988, CIA CREST Database, CIA-RDP90M00551R002001250013-7.

warning. Consequently, the United States turned to its allies, particularly Australia and the United Kingdom, the former because of its large land-mass in the Southern Hemisphere and the latter because of its overseas territories. Hosting U.S. space infrastructure became an important dimension of Washington's alliances with both states. But hosting satellite tracking and surveillance stations on their territories was complicated. Using British colonial territories for key U.S. space facilities in the Indian Ocean was inherently politically risky, given the possibility that they would gain independence. In Australia, the United States faced the possibility that growing domestic political opposition to its presence might lead Australia to expel vital military space facilities, including a nuclear early warning ground station.

These case studies reveal significant variation in the degree to which states effectively used the leverage afforded to them by hosting U.S. space infrastructure. In general, non-ally states attempted to extract greater concessions from Washington than allies. For example, after the Seychelles gained its independence, it demanded excessively high rent for the U.S. Air Force tracking station on Mahé. South Africa and Morocco tried to use U.S. space infrastructure as a quid pro quo for arms deals that were politically controversial for Washington. Allies, on the other hand, tended to be cautious in using their leverage. Britain understood the significance of its Indian Ocean territories and used them to secure a lower price for U.S. nuclear delivery vehicles. For Canberra, hosting the joint facilities strengthened defense and intelligence ties with Washington, but it stopped short of using them to extract firmer security guarantees or trade concessions. Australia's reluctance to use its leverage more forcefully stemmed from a deep-rooted fear that pushing too hard could break the alliance. Moreover, it is unclear whether Australia fully understood the extent of the leverage that it possessed.

The political costs for U.S. allies and partners for hosting these facilities was a primary reason why they became a source of leverage in their dealings with the United States. U.S. space infrastructural requirements were a factor in Britain's maintenance of a controversial colonial presence in the Indian Ocean. Meanwhile, the joint facilities made Australia a potential nuclear target and generated domestic political criticism that Canberra did not exercise sufficient oversight of U.S. activities on its soil, thereby violating Australia's sovereignty. The secrecy surrounding the joint facilities only exacerbated public opposition to them.

The lessons drawn from these cases are not unique to the Cold War. Indeed, space infrastructure is more important today than ever, especially because

China is emerging as a U.S. competitor in space.¹⁸⁹ Acquiring the rights to base space infrastructure on politically stable foreign territories is a key element of U.S.-China space competition, as both countries expand their terrestrial space footprints to support growing investment in military and civilian satellites.¹⁹⁰ Unlike the United States, China lacks treaty allies with desirable real estate for basing space infrastructure. Chinese leaders must therefore use inducements, such as scientific and economic cooperation, to secure basing rights for satellite ground stations and surveillance hardware.¹⁹¹ In some instances, Beijing is using civilian scientific activities to obfuscate military space facilities.¹⁹² China is also deploying satellite tracking vessels to fill gaps in its global network.¹⁹³

Meanwhile, the United States is doubling down on its Cold War-era strategy of leveraging its allies. The Department of Defense is expanding space surveillance in Britain and Australia.¹⁹⁴ In addition, U.S. allies in Asia and Europe now have their own radars and telescopes for monitoring satellites that feed data to the United States.¹⁹⁵ Similarly, U.S. and European companies have established commercial ground stations for space surveillance that buttress U.S. and allied capabilities.¹⁹⁶ These developments underscore the enduring importance of terrestrial real estate in superpower competition for space superiority.

189. Fiona S. Cunningham, *Under the Nuclear Shadow: China's Information-Age Weapons in International Security* (Princeton, NJ: Princeton University Press, 2025), chap. 5.

190. Cate Cadell and Marcelo Perez del Carpio, "A Growing Global Footprint for China's Space Program Worries Pentagon," *Washington Post*, November 21, 2023, <https://www.washingtonpost.com/world/interactive/2023/china-space-program-south-america-defense/>.

191. Matthew Funaiolo et al., "Eyes on the Skies: China's Growing Space Footprint in South America," Center for Strategic and International Studies, *Hidden Reach*, No. 1, October 4, 2022, <https://features.csis.org/hiddenreach/china-ground-stations-space/>.

192. Ibid.

193. Henry Boyd, Erik Green, and Meia Nouwens, "Space: China's TT&C Capabilities and Space Diplomacy," International Institute of Strategic Studies, July 17, 2025, <https://www.iiss.org/charting-china/2025/07/space-chinas-ttc-capabilities-and-space-diplomacy/>.

194. Rebecca Connolly, "Space Surveillance and AUKUS: The Power of Awareness," *Interpreter*, Lowy Institute, January 19, 2024, <https://www.lowyinstitute.org/the-interpreter/space-surveillance-aukus-power-awareness>.

195. For one example, see Mike Gruss, "U.S. and Germany Sign Space Surveillance Pact," *SpaceNews*, January 31, 2015, <https://spacenews.com/u-s-and-germany-sign-space-surveillance-pact>.

196. The U.S. Exoanalytic Solutions and the European Aldoria are two examples. See: Exoanalytic Solutions, <https://exoanalytic.com>; Aldoria, <https://www.aldoria.com/space-surveillance-sensors/>.