Table and photokey of antennas at Pine Gap

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[caption id="attachment_46957" align="aligncenter" width="745"]

Figure 1. Antenna systems at Pine Gap, Google Earth imagery, 6 November 2015.
Note: for antenna identification system see Desmond Ball, Bill Robinson and Richard Tanter, The Antennas of Pine Gap, Nautilus Institute, Special Reports, February 2016.[/caption]

Antenna identification system

One aim of this research is to identify all antenna systems installed at Pine Gap since 1967, with a view to then understand their characteristics and likely roles. There is no publicly available information about the system by which the US government identifies antennas and other elements of Pine Gap infrastructure. Over a number of years, the authors have used different systems of antenna identification, each mainly based on the numerical order in which antennas were installed. As the number of antennas known to have been installed grew, and as more accurate information about the

date of antenna installation was established (and on occasion revised more than once), it became clear that the identification of a particular antenna in a straightforward chronological system may need to be revised, sometimes more than once, leading to confusion. In Table 1, column 2, the authors introduce a year-based identification system.

The antennas are listed in chronological order, with some allowance for uncertainty in particular cases. The antenna identification number in column 2 is based on the year that the antenna was installed (see column 6), with a letter suffix further identifying it within the group installed that year. The first antenna listed, 67-A, was built in 1967, and it was the first (and only) antenna built that year. The second antenna listed, 68-A, was one of four installed in the following year. In cases of uncertainty, the best estimate is noted with a question mark. When an antennna is known to have been installed at some point during a specific period, the indentification number is derived from the earliest possible year of construction in that range – e.g. antenna 86-A is known to have been installed between 1986 and 1988.

Table 1. Antennas at Pine Gap

(Source: Desmond Ball, Bill Robinson, and Richard Tanter, *The Antennas of Pine Gap*, Nautilus Institute Special Report, 22 February 2016.)

	Authors' numbering system ID	Size (ft.) antenna/ radome	Size (m.) antenna/ radome	Coordinates	Built	Comments
1	67-A	?			1967	No radome. UHF Yagi antenna.Located on the roof of the Operations Building. Provided link to the Alice Springs Telecom tower.Dismantled.
2	68-A	85/125	26/38	-23.798403°, 133.736261°	1968	Radome replaced in 1977.
3	68-B	?/67	?/20	-23.799296°, 133.736276°	1968	Radome replaced in 1977.
4	68-C	?		-23.797437°, 133.738290°	1968	No radome. HF radio transmitting antenna. Located on the NE side of the Operations Building. Tower is about 53 metres high.
5	68-D	?		-23.796319°, 133.738033°	1968	No radome. HF radio receiving antenna. Tower is about 15 metres high.
6	69-A	?/60	?/18	-23.798040°, 133.737430°	1969	Radome. 'Research' dish. Dismantled in 1973. Site occupied by 73-A in 1973.

7	69-B	?/15	?/5	-23.798814°, 133.736224°	1969	Radome. Dismantled in 1980. Upgraded to 80-B in 1980.
8	69-C	?	?	?	1969	No radome. Dismantled.
9	71-A	?/50	?/15	-23.798849°, 133.736185°	1971	Radome.
10	73-A	35/60	11/18	-23.798040°, 133.737430°	1973	Radome. SCT-35 DSCS dish. Dismantled in 1991-1994. Located at site previously occupied by 69-A. Operations Building addition built on site c.1998.
11	77-A	?/50	?/15	-23.798071°, 133.736247°	1977	Radome.
12	80-A	8/15	2/5	-23.798773°, 133.737046°	1980	Radome. SCT-8 DSCS dish. Installed on roof of Operations Building.
13	80-B	?/25	?/8	-23.799051°, 133.736280°	1980	Radome. 'Upgrade' in size of 69-B.
14	84-A	?	?	?	1984	No radome. Large HF LPA.Dismantled by 1997.
15	85-A	95-100/125	29-31/38	-23.797614°, 133.736466°	1985	Radome. Reportedly associated with the Orion-1 (Magnum-1) satellite.
16	86-A	25/	8/	-23.797372°, 133.737366°	1986-1988	No radome.
17	87-A	18/	5/	-23.799438°, 133.739077°	1986-1988	No radome. South of tennis court. TV reception?
18	88-A	18/	5/	-23.799505°, 133.739129°	1986-1988	No radome. South of tennis court. TV reception?
19	88-B	?	?		1986-1988	No radome. Dismantled.
20	89-A	?/22	?/7	-23.799415°, 133.735998°	1989	Radome. Dismantled. Site later occupied by 11-A.

21	90-A	?/30	?/9	-23.796753°, 133.737278°	1990-1991	Radome. One of pair announced in August 1990. Communications.
22	90-B	?/100	?/30	-23.796316°, 133.737278°	1990-1991	Radome. One of pair announced in August 1990. Communications.
23	98-A	33/52	10/16	-23.800425°, 33.732769°	1998	Radome. DSP/SBIRS.
24	98-B	33/52	10/16	-23.800811°, 133.732769°	1998	Radome. DSP/SBIRS.
25	99-A	66/	20/	-23.795116°, 133.737281°	1999?	No radome. Communications re DSP/SBIRS.
26	99-B	66/	20/	-23.795576°, 133.737288°	1999?	No radome. Communications re DSP/SBIRS.
27	99-C	72/100	22/30.5	-23.797218°, 133.736466°	1999	Radome. One of pair built just N of 85-A. FORNSAT/COMSAT collection role.
28	99-D	72/100	22/30.5	-23.796774°, 133.736462°	1999	Radome. One of pair built just N of 85-A. FORNSAT/COMSAT collection role.
29	99-E		3/	-23.795257°, 133.737448°	Before 9.2004	No radome. Present in 1999 DoD photo. Dismantled between October 2014 and January 2016.
30	01-A		6/	-23.795250°, 133.737121°	Before 9.2004	No radome.
31	01-B		2.5/	-23.795135°, 133.736749°	Before 9.2004	No radome. Present ?/2004-2012/13. Dismantled in 2013.
32	01-C[1]					No radome. Dismantled. Not present in September 2004.
33	03-A	16/	5/	-23.799829°, 133.732699°	2003-2004?	No radome. RGS area. Dismantled in 2011-2012.
34	03-B	16/	5/	-23.800025°, 133.732712°	2003-2004?	No radome. RGS area. Dismantled in 2011-2012.

35	04-A			western mast: -23.795454°, 133.737057° eastern mast: -23.795459°, 133.737176°	8.2005 - 10.2009	Helical antenna array. Located on southwest and southeast corners of the building between 99-A and 99-B. Two small single helical antennas installed by September 2004. Present in Google Earth imagery dated 8 September 2004.
36	05-A	?/17	?/5	-23.799853°, 133.733103°	2005-2008?	Radome. STSS-related?
37	05-B	?/17	?/5	-23.799856°, 133.733361°	2005-2008?	Radome. STSS-related?
38	05-C		4/	-23.796584°, 133.737283°	2005-2009	No radome. Built in 2005-2009.
39	05-D		4/	-23.796594°, 133.737190°	2005-2009	No radome. Built in 2005-2009.
40	05-E			-23.795813°, 133.737426°	2005-2009	Helical antenna array. Located south of 99-B. Four masts with twin helicals installed between 2005 and 2009. Not present in Google Earth imagery dated 11 August 2005. Present in TerraServer imagery in October 2009.
41	08-A	75?/	23?/	-23.803366°, 133.738043°	2008	Torus multiple-beam antenna. FORNSAT/COMSAT collection role.
42	10-A	95-100?/125	29-31?/38	-23.796265°, 133.736433°	2010	Radome. Probably associated with the Orion-7 satellite.
43	11-A	40/	12/	-23.799440°, 133.735973°	2011-2012	No radome. Installed on the site previously occupied by 89-A.
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44	12-A	?/17	?/5	-23.799822°, 133.733232°	2012	Radome. STSS-related?
45	13-A	33?/52?	10/16	-23.800003°, 133.732771°	2013	Radome. DSP/SBIRS.
46	13-B	?/ca. 60?	?/18	-23.801743°, 133.732762°	2013	Radome. SBIRS-related?

[1] The existence of Antenna 01-C is implied in the May 2002 Ministerial Statement that three uncovered antennas were installed between the 1999 official photograph (Figure 31) and May 2002.

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