

9. JMSDF ELINT/Undersea Surveillance Stations

The Japanese Maritime Self-Defense Force (JMSDF) has at least 14 listening stations serving as shore terminals for the underwater hydrophone arrays, but which are typically also equipped with marine surveillance radars sites and electronic intelligence (ELINT) collection systems, and sometimes also with optical observation equipment. A report released by the Council on Security and Defense Capabilities in June 2004 identified 12 'coastal surveillance and intelligence collection' stations (including those at Rebun Island, Wakkanai and Shibetsu in northern Hokkaido identified with Japanese Ground Self-Defense Force (JGSDF) units).¹ The report did not, however, include the two ocean observation stations maintained by the Oceanographic Command, which have both been widely reported in other Japanese sources as having sound surveillance systems (SOSUS). Nor did it include Hachinohe, which was reportedly equipped with an LQO-3 system around 1970, but which may no longer be operational. Some of the Coastal Defense Stations established for harbour defence in the 1950s have been closed, such as one that was built at Awaji, in Osaka Bay, in 1957 but was closed in 1987, and another at Kogozaki, at the entrance to Sasebo Bay, which was opened in March 1959 and closed in June 1990.

The 14 identified operational stations are located at Noshiyappu, at Wakkanai, at the tip of the cape that defines the southern side of the Soya Strait; Rebun Island, in the western approaches to the Soya Strait; Shibetsu, covering the eastern approaches to the Sea of Okhotsk and northern Hokkaido; Matsumae and Shirakami Saki, on the south-western point of Hokkaido, protruding into the Tsugaru Strait; Tappi Zaki, on the Tsugaru Peninsula in north-west Honshu, directly across the Tsugaru Strait from Shirakami Saki; Higashidori, on the Shimokita Peninsula; Kannon Zaki, at the entrance to Tokyo Wan (Bay); Kii, in Wakayama Prefecture, at the entrance from the Pacific Ocean to the Kii Strait and Osaka Bay; Mutsure-jima, at the western entrance to the Kanmon Strait and the Inland Sea; two stations on Tsushima Island (one on each of the North and South islands); Wakamiya, at the northern end of Iki Island, between Tsushima Island and Kyushu; and at the Ocean Observation Facility at White Beach on Okinawa (see Map 1 and Table 1).

1 「警戒監視情報の収集態勢(1):陸上及び海上自衛隊」, アジア太平洋地域の安全保障環境と地域的な安全保障のための取組, 第5回「安全保障と防衛力に関する懇談会」資料, 平成16年6月29日 [‘Maritime Surveillance and Intelligence Collection (1) JGSDF and JMSDF’], at www.kantei.go.jp/jp/singi/ampoboue/dai5/5siryou.pdf

Table 1. JMSDF ELINT/undersea surveillance sites

Site	Comments
1. Rebun Island, Hokkaido	JGSDF 301st Coastal Surveillance Unit.
2. Noshyappu, Wakkanai, Hokkaido	A single LQO-3 system installed around 1971. Replaced by an LQO-3A system in the early 1980s. JGSDF 301st Coastal Surveillance Unit. 301st Unit maintained a 36-element CDAA from 1988 to 2009. Replaced by a 7-element CDAA in 2009. Also 301st Unit at Maruyama, established in 1981.
3. Shibetsu, Hokkaido	JGSDF 302nd Coastal Surveillance Unit. Maintained a 36-element CDAA at Higashi Nemuro from 1991 to 2010. Replaced by a 7-element CDAA at JASDF SIGINT site at Nemuro in 2010. Associated unit at Rausu.
4. Matsumae, Hokkaido	New HQ building opened in 1968. New cable installed in 1971. Expanded and upgraded in 1990–91. US Navy team in the 1980s and 1990s.
5. Matsumae/Shirakami, Hokkaido	LQO-3 system installed in 1968. Replaced by an LQO-3A system in the early 1980s. Replaced by an LQO-4 system c. 1984.
6. Tappi Zaki, Aomori Prefecture, Honshu	LQO-3 system installed in 1968. Replaced by LQO-3A system in 1981–82. Replaced by an LQO-4 system around 1984.
7. Shimokita Peninsula, Higashidori, Aomori Prefecture	Shimokita-hanto Ocean Observation Station, Higashidori. Maintained by the JMSDF's Oceanographic Command.
8. Hachinohe, Aomori Prefecture	A single LQO-3 array reportedly installed in the 1970s.
9. Kannon Zaki, Tokyo Bay	
10. Kii, Hino-misaki, Wakayama Prefecture	Kii Guard Station became operational in December 1975. Probably initially equipped with an LQO-3 system, later replaced by an LQO-3A system.
11. Kami-tsushima, Tsushima Islands	LQO-3 system installed in 1968. Replaced by an LQO-3A system in the early 1980s. Replaced by an LQO-4 system around 1984.
12. Shimo-tsushima, Tsushima Islands	LQO-3 system installed in 1971–72. Replaced by an LQO-3A system in the early 1980s. Replaced by an LQO-4 system around 1984.

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13. Mutsure-jima, Shimonoseki, Yamaguchi	Opened on 1 December 1957. Operated remotely from Shimonoseki Guard Station. Surveillance radar installed in 2010.
14. Wakamiya, Iki Island	LQO-3 system installed in 1968. Replaced by an LQO-3A system in the early 1980s. Replaced by an LQO-4 system around 1984.
15. Kogozaki, Sasebo, Kyushu	Kogozaki Coastal Defense Station, Sasebo. US Navy anti-submarine net, 1945–59. US Navy – JMSDF Coastal Defense Station, March 1959 to May 1969. Returned to Japan in May 1969. Closed in June 1990, but buildings still maintained until the early 2000s. A Zeni Lite oceanographic navigation system installed in 1993.
16. White Beach, Katsuren, Okinawa	White Beach Ocean Observation Station, Katsuren. Maintained by the JMSDF’s Oceanographic Command.
17. Yonaguni	JGSDf Coastal Surveillance Station under construction, to be operational in 2015. A hydrophone array reportedly installed around 2010.

In addition, it is likely that by the early 1980s, when the Japanese Government accepted the responsibility of defence of the sea lanes out to 1,000 nautical miles, the JMSDF had installed acoustic listening stations at various islands along the Honshu Ridge, running south from Tokyo Bay to the Marianas. The case for these stations was publicly articulated in 1971 in a detailed account of Japan’s maritime defence requirements by Commander Hideo Sekino, a former JMSDF officer. He argued, after dismissing the likelihood of a Soviet conventional invasion of Hokkaido, that Japan’s key strategic priority was defending its sea lanes against attacks by Soviet submarines and aircraft, that the JMSDF could control the Soya, Tsugaru, Shimonoseki and Tsushima Straits, thus inhibiting passage of the Soviet Pacific Fleet between the Sea of Japan and the Pacific Ocean, but that defence of the south-eastern approaches required extension of the underwater barrier by the establishment of listening stations at such places as the Izu Islands, just south of Tokyo Bay; the Ogasawaras (Bonin Islands); and Iwo Jima. Sekino estimated that a series of passive hydrophone and very low frequency (VLF) active sonar arrays dispersed at intervals along this island chain would ensure a ‘high chance that targets would be detected during

their passage from 100, or even 200 miles away', enabling 'patrol planes and helicopters based on some of these islands ... to reach the points of detection within one hour'.²

Data collected by the undersea systems is relayed automatically by the shore stations to the Anti-submarine Warfare Center at the JMSDF's HQ at Yokosuka where it is 'bulk processed'. As of the late 1990s, the processed and correlated information was sent weekly to the Japan Defense Agency (JDA) HQ and the JMSDF's Maritime Staff Office. Data collected by the systems at Matsumae and Tsushima Island was reportedly also transmitted directly to the United States.³ Data collected at the Shimokita-hanto and White Beach stations is probably also sent directly to the United States.

Wakkanai, Maruyama and Rebus Island

Wakkanai is located at the north-westernmost tip of Hokkaido, just 43 kilometres across the Soya (or La Perouse) Strait from Russia's Sakhalin Island. An observation station established in 1904 for monitoring Russian naval movements is a tourist attraction at Cape Soya, the northernmost point of Japan, 27 kilometres east of Wakkanai.

The US Navy at different times in the 1950s and 1960s conducted both undersea acoustic and ELINT activities at Wakkanai. The 'experimental' *Caesar* SOSUS station was established in 1957. According to a US Air Force officer who worked at the large US signals intelligence (SIGINT) station at Wakkanai in 1963–65, the US Navy in that period also maintained an ELINT unit there, code-named Operation *Cointreau*, which monitored the electronic emissions of Soviet submarines passing through the Soya Strait (which it called the 'Hokkaido Gate') and which was able to identify Soviet submarines 'by class, name and number'.⁴

The JMSDF laid a single LQO-3 hydrophone array from Noshiyappu into the Soya Strait around 1970.⁵ According to Japanese peace activists who researched some of the JMSDF's SOSUS sites, it was upgraded with an LQO-3A system in the early 1980s. The JMSDF is a tenant unit at the large Wakkanai SIGINT station, taken over by Japan from the United States in 1975.

2 Hideo Sekino, 'Japan and Her Maritime Defense', pp. 105, 120. See also James E. Auer, *Postwar Rearmament*, pp. 139–42; Euan Graham, *Japan's Sea Lane Security*, pp. 104–07.

3 Iku Aso, *Sensen Fukoku*, p. 92.

4 Bill Person, *Critic Makers: The Ironworks Incident* (Imprint Books, 2004), pp. 64, 200, 204.

5 Friedman, *Naval Institute Guide*, p. 21; Jeffrey T. Richelson, *Foreign Intelligence Organizations*, p. 261.

The primary responsibility for surveillance of the Soya Strait resides with the JGSDF's 301st Coastal Surveillance Unit, another tenant unit at the Wakkanai SIGINT station, where it had 40 personnel in 1988. In addition to ELINT capabilities, it maintains a 7-element circularly disposed antenna array (CDA), constructed in 2009–10, for HF interception and HF DF operations (see Plate 1). (This replaced a 36-element system, with two concentric 18-element circles, which had been installed in 1987–88.) The 301st Communications Company provides the communication services for the 301st Coastal Surveillance Unit.

The JGSDF's 301st Coastal Surveillance Unit also maintains a detachment at Maruyama ('round mountain'), a 170-metre high rounded hill situated about 3 kilometres south of Cape Soya, which was established on 1 November 1981. It reportedly had 80 personnel in 1988. The operations building is a three-tiered concrete structure, with an 8-metre diameter radome atop the second tier and two 4-metre diameter radomes on the roof of the top tier. There are about 10 horizontal and vertical VHF/UHF log-periodic arrays (LPA) around the building, as well as a mast with 7-element UHF and VHF Doppler direction-finding (DF) arrays, and a microwave dish pointing south-west to Wakkanai (see Plate 2).

The 301st Coastal Surveillance Unit is the main unit at the SIGINT station on Rebus Island. Its existence was noted in a Japanese magazine in May 1987;⁶ and it was described in reports by Japanese peace groups in the early 1990s.⁷ It was established in 1979, and consists of a two-storey operations building; a 5-metre diameter radome near the north-western corner of the roof of the operations building; a three-storey building on the eastern side of the hill below the operations complex; a mast with four VHF LPAs on the northern side of the complex; a mast with 7-element UHF and VHF DF arrays identical to the one at Maruyama; and four tall masts holding HF wires (see Plate 3). Communications between Rebus Island and Wakkanai are provided by the 301st Communications Company.⁸

6 Tetsuo Kawamoto, 'Reorganization of Ground Self-Defense Force Divisions Seen', *Gunji Kenkyu*, May 1987, in Foreign Broadcast Information Service (FBIS), JPRS Report: East Asia, JPRS-JAR-87-005, 2 November 1987, pp. 11–12, at www.dtic.mil/dtic/tr/fulltext/u2/a346884.pdf

7 『北海道のC3I基地に見る新たな福強と変化』、松井愈 (著者)、1993年日本平和会国際会議、C3I分科会・18th 全道基地闘争活動者会議 (93・10 [Matsui Masaru, 'Looking at New Developments and Changes in Hokkaido C³I Bases, Japan Peace Committee International Conference, C3I Sub-committee; and 18th National Base Struggle Activists Conference (October 1993)', Hokkaido Peace Committee Study Document No. 26, 8–1994], p. 3 and map on back cover.

8 「警戒監視情報の収集態勢 (1) : 陸上及び海上自衛隊」, アジア太平洋地域の安全保障環境と地域的な安全保障のための取組, 第5回「安全保障と防衛力に関する懇談会」資料, 平成16年6月29日, ['Maritime Surveillance and Intelligence Collection (1) JGSDF and JMSDF'], 29 June 2004, at www.kantei.go.jp/jp/singi/ampobouei/dai5/5siryou.pdf; 「礼文分屯地」 ['Rebus Island Base'], Wikipedia – Japanese, at ja.wikipedia.org/wiki/%E7%A4%BC%E6%96%87%E5%88%86%E5%B1%AF%E5%9C%B0

Administrative and logistic support for the 301st Unit's facilities at Wakkanai, Maruyama and Rebun Island is provided by the JGSDF base at Nayoro, 160 kilometres south of Wakkanai. The 301st Communications Company has units at Nayoro and at Asahikawa for direct communications with the 301st Unit's stations at Rebun Island and Wakkanai.⁹

Shibetsu

Surveillance of the eastern entrance to the Sea of Okhotsk, through the Notsuke Sea, is the responsibility of the JGSDF's 302nd Coastal Surveillance Unit based at Shibetsu, in Nemuro district, in the north-east corner of Hokkaido. Shibetsu is about 23 kilometres across the Nemuro Strait from Kunashiri, at the southern end of the Kuril Islands chain. Shibetsu is one of the islands that were occupied by the Soviet Union in 1945 and which Japan claims as part of its Northern Territories. A hydrophone array is presumably fixed to the bottom of the strait and connected by cable to a convenient point on the shoreline near Shibetsu. The 302nd Unit at Shibetsu was identified by Japanese peace groups in the late 1980s.¹⁰ Its HQ is situated in Shibetsu town, about five to six streets back from the shoreline. Organisationally, it is an 'operational unit' of the JGSDF's Kushiro Base, located about 100 kilometres south-west of Shibetsu. The 302nd Communications Company provides communications services for the unit.¹¹

The 302nd Unit has three monitoring facilities located near Shibetsu. The main operations base is located at Kawakita, on a mountain ridge 19 kilometres west of Shibetsu.¹² There are five radomes covering interception systems, comprised of one with a diameter of about 11 metres situated on the ground at the front (facing the Nemuro Strait to the east), a green one mounted above the first one, with a diameter of about 6 metres, and three cylindrical thimbles with diameters

9 「名寄駐屯地」 ['JSDF Nayoro Camp'], Wikipedia – Japanese, at ja.wikipedia.org/wiki/%E5%90%8D%E5%AF%84%E9%A7%90%E5%B1%AF%E5%9C%B0; 「旭川飛行場」 ['JGSDF Asahikawa Base'], Wikipedia – Japanese, at ja.wikipedia.org/wiki/%E6%97%AD%E5%B7%9D%E9%A3%9B%E8%A1%8C%E5%A0%B4

10 『北海道のC3I基地に見る新たな福強と変化』、松井愈（著者）、1993年日本平和会国際会議、C3I分科会・18th 全道基地闘争活動者会議（93・10 [Matsui Masaru, 'Looking at New Developments and Changes in Hokkaido C³I Bases, Japan Peace Committee International Conference, C3I Sub-committee; and 18th National Base Struggle Activists Conference (October 1993)', Hokkaido Peace Committee Study Document No. 26, 8–1994], p. 3 and map on back cover.

11 国土地理院 [National Geographical Survey Institute], at watchizu.gsi.go.jp/watchizu.aspx?id=65453150&slidex=0&slidey=800; 標津分屯地」 ['Shibetsu Base'], Wikipedia – Japanese, at ja.wikipedia.org/wiki/%E6%A8%99%E6%B4%A5%E5%88%86%E5%B1%AF%E5%9C%B0

12 「北方最前線！！ 謎のレーダーサイト！？」、千島の桜 – Nakashibetsu Hokkaido ['Northern Frontline, Sakura of Chishima – Nakashibetsu Hokkaido], 3 October 2009, at blogs.yahoo.co.jp/panzer_tiger222/archive/2009/10/3

of about 5 metres located on top of a one-storey square room. There is also a steel tower with two microwave dishes pointing towards the JGSDF base in Shibetsu, and two other towers holding VHF antenna systems (see Plate 4).

The 302nd Coastal Surveillance Unit maintains another ‘operational unit’ at Rausu, on the eastern side of the Shiretoko Peninsula, about 25 kilometres from Kunashiri, and about 55 kilometres by road from Shibetsu. The Rausu facility comprises a three-storey building, about 10 metres high, with a 6-metre diameter radome on the roof, connected by an enclosed passageway to a two-storey administration and operations building. Behind these buildings is a tower with two microwave dishes on the side and 7-element UHF and VHF Doppler DF systems on the top identical to those at Maruyama and Rebun Island. About 20 metres away is another steel tower with three vertical VHF and four HF whip antennas (see Plate 5).

In 1993, the Shibetsu unit established facilities at the JASDF’s SIGINT station at Nemuro, about 75 kilometres by road from Shibetsu. These are located north-west of the main JASDF complex, and consist of a two-storey operations building, a 12-metre diameter radome on top of the operations building, and four tall steel towers. The first two towers were built in 1993. One of these, on the north-west side of the operations building, has a small platform on top holding a VHF pole as well as both horizontal and vertical VHF LPAs (see Plate 6). The second tower, on the south-east side, holds a VHF/UHF DF system, with separate 5-element VHF and 5-element UHF arrays.¹³

The third and fourth towers were built between November 2007 and March 2010. One of these is on the south-west side of the compound, and holds a 5-element VHF and 5-element UHF DF system; it is similar but not identical to the VHF/UHF DF system on the second tower. The fourth tower is located on the eastern side of the JGSDF’s compound and holds additional VHF LPA systems.

The 302nd Coastal Surveillance Unit also maintains a 7-element CDAA at the JASDF’s Nemuro SIGINT station, built in 2010 (see Plate 7). (It has replaced a 36-element CDAA, similar to those previously located at Wakkanai and Kobunato, which was situated in Higashi Nemuro, on the Pacific coast, and which was constructed in 1991–92.¹⁴ It was dismantled in September 2011.)

In addition, the JMSDF maintains a facility on the hook-shaped Notsuke Peninsula, at its closest point to Kunashiri (about 16 kilometres across the

13 『北海道のC3I基地に見る新たな福強と変化』、松井愈（著者）、1993年日本平和会国際会議、C3I分科会・18th全道基地闘争活動者会議（93・10 [Matsui Masaru, ‘Looking at New Developments and Changes in Hokkaido C³I Bases, Japan Peace Committee International Conference, C3I Sub-committee; and 18th National Base Struggle Activists Conference (October 1993)’, Hokkaido Peace Committee Study Document No. 26, 8–1994], pp. 10–11.

14 *ibid.*, p. 12.

Nemuro Strait) and about 15 kilometres south-east of Shibetsu. It consists of a two-storey building situated on the seashore, with living quarters for about four staff on the ground floor and the observation rooms, equipped with large, high-magnification binoculars and camera, comprising the upper floor (see Plate 8). The hydrophone array across the Nemuro Strait is evidently connected to this building.

Matsumae and Shirakami

The JMSDF maintains two undersea surveillance shore stations near Hakodate, officially called Matsumae Coastal Defense Station and Shirakami Detachment of Matsumae Coastal Defense Station. The Matsumae Coastal Defense Station was established in 1968 (it celebrated its 35th anniversary on 1 May 2003).¹⁵ Cape Shirakami is located about 7 kilometres south-east of Matsumae, and is the closest point in Hokkaido across the Tsugaru Strait to Honshu. Both places have long been used for surveillance of the entrance to the Strait. For example, a schematic map of Cape Shirakami that was drafted during the Second World War, when it was also a major artillery emplacement, shows two observation stations and an ‘underwater listening station’.¹⁶ Today, public entry to both sites is prohibited. A visitor seeking out the ruins of the Shirakami Artillery Station inside the prohibited area was told: ‘Entry is forbidden because this is a most important national defence facility’.¹⁷ It was reported in February 1985 that ‘US civilians [worked] at the Shiragami guard post’.¹⁸

Five LQO-3 arrays were installed in the Tsugaru Strait in the late 1960s and early 1970s.¹⁹ The first two, installed in 1967–68, were presumably located at Tappi Zaki and Shirakami, the narrowest part of the Strait. ‘All the buildings’ at both Shirakami and Tappi Zaki were completely renovated in the 1980s, and ‘the underwater microphones were also changed from the LQO-3s to new model LQO-4s’.²⁰ Cables to the hydrophone arrays enter the sea at the Shintakano Bridge, about 3 kilometres west of the Shirakami station. The ELINT systems at Shirakami include antennas housed in a large hemispherical radome and in

15 「北海道地方」、『自衛隊イベント情報 [2003年版]』[‘Hokkaido: Information on JSDF Events 2003’], at www003.upp.so-net.ne.jp/rightwing/event/2003/hokkaido2003.html

16 「白神岬砲台」[‘Shirakami-misaki Battery’], at www006.upp.so-net.ne.jp/fortress/tsugaru/shirakami.htm

17 *ibid.*

18 ‘White Paper: Nuclear War and the Self-Defense Forces’, at www.dtic.mil/cgi-bin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA349828

19 Naoaki Usui, ‘Japan Plans to Bolster Already Formidable ASW Ability’, p. 14.

20 ‘White Paper: Nuclear War and the Self-Defense Forces’, at www.dtic.mil/cgi-bin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA349828

a cylindrical radome, a discone omnidirectional UHF DF system, and two VHF LPAs, one pointing to the south-west and the other to the south-east (see Plate 9).

The main Matsumae site is better placed for the landing point of a longer cable reaching out to the middle of the Sea of Japan and using the US-supplied deep-water, long-range hydrophone array and long cable installed in 1972. It is located above a 20-metre cliff, on the north-western side of the JMSDF's harbour (see Plate 10). According to accounts by local fishermen, the *Tsugaru* cable-laying ship connected a long cable to the Matsumae station in 1972. They said that for 'dozens of years', two cables could be seen coming out of the cliff. During the 1970s, the area at the base of the cliff was covered by large concrete blocks to prevent storm damage, but the presence of four cables was reported by Hokkaido peace groups in the early 1980s. These reports also described a three-storey 'observation/surveillance' building, with a 'secret underground room', and recorded that at least 200 JMSDF personnel were stationed at the Matsumae base.²¹

The Matsumae station was substantially expanded in 1991–92. A new facility, with an underground computer building, was built on the western side of the existing HQ. Reports by Hokkaido peace groups in the early 1990s noted that the historical purpose of the station was to monitor ships passing through the Tsugaru Strait, but that a 1,000-kilometre-long cable had also been installed at the station, which extended the coverage across the Sea of Japan, enabling traffic leaving Vladivostok Bay and entering from the Sea of Okhotsk to be monitored. They also noted that a group of Russian linguists worked at the station, and that the station listened to the sounds of the propellers on Soviet submarines. They said that a small US unit had been stationed at the base for many years, usually involving six to eight personnel, mainly women, and that a new team was working in the building constructed in 1992.²²

Photographs of the operations area in 1992 show a microwave tower with two dishes next to the operations building, a stand with three hemispherical radomes, a cylindrical radome on the roof of a building, and a tower with two hemispherical radomes and one cylindrical radome. Three radars and four other antennas were situated on the hill above the station.²³ Recent high-resolution Google Earth imagery shows no apparent changes to this infrastructure.

21 'Sea-bottom Cable-laying Ship Operating Offshore', *Asahi Shimbun*, 17 June 1984.

22 『北海道のC3I基地に見る新たな福強と変化』、松井愈（著者）、1993年日本平和会国際会議、C3I分科会・18th全道基地闘争活動者会議（93・10 [Matsui Masaru, 'Looking at New Developments and Changes in Hokkaido C³I Bases, Japan Peace Committee International Conference, C3I Sub-committee; and 18th National Base Struggle Activists Conference (October 1993)', Hokkaido Peace Committee Study Document No. 26, 8–1994], pp. 4–5.

23 *ibid.*, pp. 2, 5.

Tappi Zaki

Tappi Zaki, in Aomori prefecture, is located at the north-westernmost point of Honshu. It is a windswept outcropping of land, noted for its severe gales, with its cliffs battered by the seas. On a clear day, it is possible to see Shirakami across the Tsugaru Strait. The two sides are connected by the 35-kilometre under-seabed Seikan Tunnel. A naval observation post was built at Tappi Zaki in July 1901, and 'coastal hydrophone' arrays were laid in the Tsugaru Strait off Tappi Zaki in the 1930s. A first-generation hydrophone system was installed off Tappi Zaki in the 1950s; it was replaced by an LQO-3 system in 1968, which was in turn replaced by an LQO-3A system in 1981–82. There were 35 personnel at the station in the late 1980s.

Photographs of the Tappi Zaki facility show a hemispherical radome with a diameter of about 1 metre, containing an ELINT/ electronic support measures (ESM) antenna, two VHF radio masts, meteorological antennas and, until around 2007, an increasing number of microwave dishes. The ELINT/ESM radome was installed with construction of the LQO-3A system in early 1982. In the case of the microwave dishes, photographs show one in March 1981, before the removal of the LQO-3 system, pointing eastwards towards Ominato/Shimokita Peninsula; three in June 1982, two pointing eastwards and one pointing north-west towards Matsumae/Cape Shirakami; and three in November 1990, one pointing eastwards and two pointing north-west. There were four in 2000 and in 2002; the fourth was mounted on a separate short tower and pointed eastwards.²⁴ Sometime between August 2006 and November 2008, however, all of the dishes were removed, presumably because the microwave network was replaced by optical fibre cables for communication connections (see Plate 11).

During the Cold War, another set of cables connected to SOSUS arrays entered the sea at Horonai Point, a small man-made bay enclosed by natural rock on one side and cement tetrapods and boulders on the other, just over a kilometre south of Tappi Zaki; the cables run straight out until they vanish into the gravel bottom at the 20-metre level.²⁵ According to one report, three cables 'extend out into the Sea of Japan on a bearing of 330 degrees'. They are evidently no longer used and 'have fallen prey to anchors and corrosion'.²⁶

24 See www.fitweb.or.jp/~red2000/tappizaki.jpg; 「ごらんあれが竜飛岬」 ['Look, there is Tappizaki'], 'Out Camping with my Dog', at www11.plala.or.jp/kei-home/nikki-13-tappi-1.htm

25 'Scuba Diving: Aomori', *Outdoor Japan*, at www.outdoorjapan.com/activities/scuba/scuba-diving-ag-aomori.html; Ronald F. Stark, 'A Diving Instructor's Journal: 2001 Adventures', 15 November 2001, at www.heronet.ne.jp/~rfstark/Log2001.htm; Ronald F. Stark, 'Divine Wind Adventures: Dive Report 20 June 2009', at www.divinewindadventures.com/frame_contents.htm; Stark, 'Scuba Diving Sites', at divinewindadventures.com/Dive-Sites.htm; 'Tappizaki Diving of the Tsugaru Peninsula', at www.japanguides.net/aomori/tappizaki-diving-of-the-tsugaru-peninsula.html

26 'Sound Surveillance System (SOSUS)', at www.dosits.org/gallery/tech/pt/sosus1.htm

A Chinese navy intelligence vessel, the *Yanbing* 723, a converted 4,420-ton icebreaker that collects SIGINT for its North Sea Fleet, conducted electronic surveillance operations in the Tsugaru Strait in May 2000. Equipped with an extensive variety of radar and other antenna systems, the spy ship had ‘conducted surveillance operations in waters around Tsushima for seven days from May 14’, before proceeding north and passing through the Tsugaru Strait three times from 23 to 26 May. It accorded particular attention to the Tappi Zaki ‘guard station’.²⁷ The Japanese Foreign Minister complained about the incident to his Chinese counterpart at a meeting in July, but his complaint was dismissed.²⁸

Shimokita-hanto Ocean Observation Station

The Shimokita-hanto Ocean Observation Station is located in the Odanosawa–Aranuma area in Higashidori, in Aomori Prefecture, facing the Pacific Ocean, just south of Shiriya-saki, the north-easternmost point of Honshu, and well-placed to monitor approaches to the eastern entrance to Tsugaru Strait. It was identified as the location of a SOSUS system by Japanese peace groups in several reports in the early 1990s.²⁹ It is described as a SOSUS site on the Japanese Wikipedia website.³⁰

Organisationally, the station consists of a commander, a deputy commander, and seven departments: the Ocean Observation Department, which operates the SOSUS system; Analysis Department, which is responsible for analysis, organisation and storage of the data; Supply Department, which manages logistic and catering requirements; Internal Affairs Department, which is concerned with personnel, administration and maintenance matters; Development Department, responsible for maintenance and upgrading of the oceanographic equipment; Health Department, which provides medical services for the station’s personnel; and the Communications Department, which operates and maintains the communications equipment.³¹

27 ‘Chinese Vessel Found to Have Conducted Operations Off Boso Peninsula, Gathering Radio Wave Information During Voyage Around the Japanese Archipelago, Says MSDF’, *Sankei*, 10 June 2000, in American Embassy, Tokyo, ‘Daily Summary of Japanese Press’, 14 June 2000; NIDS, *East Asian Strategic Review 2001*, pp. 200–02.

28 ‘Reviewing ODA or China Policy?: Tokyo Only Expressed Fears’, at chinaperspectives.revues.org/document358.html

29 『北海道のC3I基地に見る新たな福強と変化』、松井愈（著者）、1993年日本平和会国際会議、C3I分科会・18th全道基地闘争活動者会議（93・10 [Matsui Masaru, ‘Looking at New Developments and Changes in Hokkaido C³I Bases, Japan Peace Committee International Conference, C3I Sub-committee; and 18th National Base Struggle Activists Conference (October 1993)’, Hokkaido Peace Committee Study Document No. 26, 8–1994], map on back cover.

30 「下北海洋観測所」[Shimokita Ocean Observation Station], Wikipedia – Japanese, at ja.wikipedia.org/wiki/%E4%B8%8B%E5%8C%97%E6%B5%B7%E6%B4%8B%E8%A6%B3%E6%B8%AC%E6%89%80

31 *ibid.*

The Technical Research and Development Institute (TRDI) also has its Shimokita Test Center in the Naganuma–Aranuma area.³² It is one of the TRDI's original test centres, dating back to the late 1950s.³³ It includes a proscribed offshore 'experimental' area, extending for about 12 kilometres along the coastline, adjacent to the ocean observation station.

The Maritime Safety Agency (MSA)/Japan Coast Guard (JCG) maintains a lighthouse and radio beacon for direction-finding purposes at Shiriya-saki, famous for its wild Kandachime horses. The lighthouse was bombed during the Second World War, killing the keeper and destroying the structure. The present complex is adorned with a variety of antennas, including a HF wire strung between two tall poles over the entrance to the lighthouse complex, a tall tower with two VHF whips on top, two VHF whips and a VHF yagi on the roof of the two-storey building next to the lighthouse, and a microwave dish on the side of the building. The radio beacon/Differential GPS (DGPS) facility is situated about 50 metres from the lighthouse complex, and consists of a small shack with a tall HF ground-plane antenna, a satellite communications antenna on the side of the building, and the DGPS system, which comprises four small orbs, about 100 centimetres in diameter, atop four masts in a square. The radio-beacon transmits a 75-watt continuous wave (CW) signal on a frequency of 9.037 megahertz, with a nominal range of 200 kilometres.

Hachinohe

The existence of a station at Hachinohe is uncertain. An LQO-3 array was reportedly installed near Hachinohe around 1971, for monitoring traffic through the eastern entrance to the Tsugaru Strait.³⁴ The location should have made it a prime candidate for installation of an LQO-4 array, the longer range system deployed in the late 1980s; the LQO-4 provided broader ocean surveillance for cueing the JMSDF's P-2J maritime patrol aircraft, for which Hachinohe was one of the main operational bases. Photographs of a JMSDF HF antenna farm at Hachinohe in the late 1980s, said to be for collecting ocean surveillance information, show some 17 tall poles, one located adjacent to a small hut in the centre of the array, an inner group of eight and an outer group of another eight. Hachinohe was not, however, included in the map produced by the Council on Security and Defense Capabilities in June 2004; it was perhaps superseded by the facilities at the ocean observation station at Higashidori, only 90 kilometres to the north.

32 'Technical Research and Development Institute: Research Centers Addresses', at www.mod.go.jp/trdi/en/misc/address.html; 'TRDI: Shimokita Test Center', at www.mod.go.jp/trdi/en/research/simokita_test_en.html.

33 Auer, *Postwar Rearmament*, pp. 220–21.

34 Richelson, *Foreign Intelligence Organizations*, p. 261.

Kannon Zaki

Kannon Zaki is located on the Miura peninsula, at the south-western entrance to Tokyo Bay, just south of the Yokosuka JMSDF/US Navy base. The area has many remnants of military facilities from the Meiji, Taisho and early Showa eras. The site was used for a Japanese navy radar station during the Second World War.³⁵ It is just 6.5 kilometres from Kannon Zaki across the Uraga Channel to Futtsu Misaki, or 8 kilometres to Isonne Misaki, in Chiba Prefecture.

There are four substantial facilities in the area, including the famous Kannon Zaki lighthouse, which is regularly visited by tourists; the JCG's Tokyo Bay Vessel Traffic Control Facility, on the northern side of the promontory; and two JMSDF facilities.

The Kannon Zaki Coastal Defense Station was originally established in the 1950s as the Yokosuka Guard Unit. On 2 December 1957, Japan and the United States signed an agreement for a loan for 'defence materials' for the Kannon Zaki station, as well as for a similar station at Kogozaki, near Sasebo. It was organised as the Kannon Zaki Coastal Defense Station of the Yokosuka Coastal Defense Group on 1 April 1960.³⁶

The Kannon Zaki Coastal Defense Station is situated close to the shoreline on the southern side of the peninsula, access to which is blocked off, a few hundred metres from the lighthouse. It comprises a two-storey building and several smaller buildings, together with several HF antennas, including a large HF curtain array.

A complementary facility is situated on the crown of the hill behind the lighthouse; it is surrounded by a wire-netting fence, with the entrance and guard post on the western side. It has a marine surveillance radar and a hemispheric ESM radome, several tall HF antennas, and eight to ten other sensor and antenna systems.

It is likely that at least two hydrophone arrays are deployed in the area, with one strung across the Uraga Channel to detect submarines entering Tokyo Bay, and another situated to provide a proximate defence of the eastern approaches to the JMSDF/US Navy complex at Yokosuka.

The JCG's Tokyo Bay Traffic Advisory Service Center is responsible for ensuring that 'hundreds of vessels a day [from huge cargo ships over 10,000 tons to small fishing boats] can safely navigate in one of the world's busiest and most

35 *Operational History of Japanese Naval Communications, December 1941–August 1945* (Aegean Park Press, Laguna Hills, California, 1985), pp. 122–23.

36 'The History of Mine-sweeper Units', at www.dii.mod.go.jp/msdf/mf/rekishi/rekishi-1.htm

congested waterways'. Larger vessels are supposed to notify the centre of their anticipated entry into the bay by noon the previous day. Cameras, radars and even binoculars are used to identify and tag every vessel passing through the Uraga Strait.³⁷ There are two towers with six to eight microwave dishes adjacent to the main building. Data on vessel movements and identities is presumably routinely passed to the JMSDF's Coastal Defense Station for correlation purposes.

In addition, the National Defense Academy maintains a maritime training facility in Hashirimizu Port in Yokosuka, about 1.5 kilometres north-west of the Tokyo Bay Traffic Advisory Service Center, which includes at least two sets of 4-element Bruel & Kjaer (B&K) Type 8105 hydrophone arrays, noted for their 'excellent directional characteristics'.³⁸ These arrays have been used to determine 'biological transient noises' that complicate submarine detection in Tokyo Bay. For example, in August 2007, a single hydrophone was used to record sounds typical of those produced by 'snapping shrimp'. In August 2009, two sets of 4-element arrays were used to measure the sounds of 'snapping shrimp' and to estimate 'the positions of those noise sources'. In October 2009, 'a pair of tetrahedral arrays' was also used to estimate the 'source positions' of such noises.³⁹

Kii

The Kii facility is located on Hino-misaki, in the Enjukaigan Prefectural Natural Park, at the most western edge of the Kii Peninsula in Wakayama Prefecture, in the south-east corner of Honshu (see Plates 12 and 13). Organisationally, it is part of the JMSDF's Hanshin base. A sign in front of the nearby lighthouse says that it was attacked by the United States on 30 July 1945 and rebuilt in 1951. The JMSDF station became operational in December 1975. Its duty is to monitor the Kii channel and to collect information concerning the security of the waterways, coastline and harbours in the area. It was commanded by Ensign Yamashita Hiroshi in 2006.⁴⁰

37 Steven L. Herman, 'Auxiliarist Reporter/Translator Works to Enhance Relationship with Japan Coast Guard', at www.teamcoastguard.org/2005/May/A050521/japan.htm

38 Bruel & Kjaer, 'Product Data: Hydrophones – Types 8103, 8104, 8105 and 8106', at www.lthe.fr/LTHE/IMG/pdf/DocBruelKjaerHydro.pdf

39 Haruki Kada, Kazuyoshi Mori, Hanako Ogasawara, Toshiaki Nakamura, Takenobu Tsuchiya & Nobuyuki Endoh, 'Preliminary Result of Biological Transient Noise Observation Using 2 Sets of 4-Element Hydrophone Array', *Proceedings of Symposium on Ultrasonic Electronics* (Vol. 30), 18–20 November 2009, pp. 165–66, at www.use-jp.org/USE2010/proceedings/USE09/pdf/1P6-7.pdf; Kazuyoshi Mori, Hanako Ogasawara and Toshiaki Nakamura, 'Observation Results for Biological Impulsive Noise at Hashirimizu Port in Tokyo Bay', *Memoirs of the National Defense Academy* (Vol. 51, No. 1), May 2011, pp. 1–12.

40 「紀伊警備所」、JMSDF阪神基地 [Kii Guard Station, JMSDF Hanshin Base], at www.mod.go.jp/msdf/hanshin/about/kii/index.html

It initially complemented the Awaji Guard Station, about 75 kilometres further north, but on the western side of Osaka Bay, at the north-western corner of Awaji Island, and only 30 kilometres from the Kobe–Osaka urban–industrial complex, which was built in 1957. It overlooked Akashi Strait, linking the Inland Sea with Osaka Bay, only 3.6 kilometres across, shallow on both sides, and having a depth only about 100 metres in its central channel. The Awaji station was closed in July 1987. The Kii station was also downgraded in 1987.⁴¹

An ESM radome is located on a hill, 201.5 metres above sea level, about 500 metres behind the JMSDF station; it is mounted on a 5-metre tower on top of a small cement building (see Plate 14). A microwave tower is situated near the lighthouse. Photographs taken in August 2006 show only one microwave dish, whereas previously there had been four, suggesting that optical fibre cables may have been installed for transmission of data traffic from the station.

In July 2000, the *Dongdiao 232*, a Yanqian-class marine survey ship used by the Chinese navy's South Sea Fleet for intelligence collection purposes, engaged in 'intelligence gathering activities' off the Kii Peninsula.⁴²

The Hanshin base also employs a magnetic measurement station at Kariya, on the northern side of Awaji township.⁴³ It is able to detect submarines approaching the Kobe–Osaka urban–industrial complex.

Mutsure-jima

The small and sparsely inhabited island of Mutsure-jima is located near Shimonoseki in Yamaguchi Prefecture, at the entrance to the Kanmon Strait, separating Honshu and Kyushu, and the western entrance to the Inland Sea. The JMSDF's Mutsure-jima Coastal Defense Station is located near the northern end of the island, at the highest point on the island (106 metres). From Mutsure-jima east to the mainland is only 5 kilometres, while south-west to the north-east point of Kyushu is about the same distance.

The station was initially established as Shimonoseki Guard Station, part of the Shimonoseki Base Group of the Sasebo District Command, on 1 December 1957.⁴⁴ Google Earth images show two main buildings, a hemispherical ESM radome, a circular antenna array, and several other sensor and antenna systems (see

41 *ibid.*

42 NIDS, *East Asian Strategic Review 2001*, p. 202.

43 「飯屋磁気測定所, 阪神基地隊について」, [‘Kariya Magnetic Measurement Station, Hanshin Base Group’], JMSDF, at www.mod.go.jp/msdf/hanshin/about/kariya/index.html

44 「六連警備所」海上自衛隊 [‘Mutsure Coastal Defense Station’, MSDF], at www.dii.jda.go.jp/msdf/mf/rekishirekishi-1.htm; 「下関基地」 [‘Shimonoseki Base’, Wikipedia – Japanese], at ja.wikipedia.org/wiki/%E4%B8%8B%E9%96%A2%E5%9F%BA%E5%9C%B0.

Plate 15). A rotating surveillance radar is located about 100 metres north of the station (see Plate 16). A visitor to the station on 4 August 2010 noted that it had been ‘recently installed’.⁴⁵ Both the ELINT/ESM station and the radar are operated remotely from the Shimonoseki Guard Station. Three JMSDF officers were at the station on 7 October 2010; they were members of the Electronics Unit of the Maintenance and Supply Squadron of the Shimonoseki Guard Station, and were performing routine maintenance of the electronic equipment.

Tsushima Island

Tsushima Island, in the Korea Strait off south-western Japan, consists of two mountainous islands, Kamino-shima (the north island) and Shimono-shima (the south island), which are connected by a combination bridge and causeway. It is the closest Japanese territory to Korea, being only 50 kilometres from Pusan, the lights of which are visible on clear nights. It is about 70 kilometres from north-western Kyushu, across the Tsushima Strait and it has historically served as both a forward defence post against attacks from Russia, Korea and China against Japan’s southern flank and a staging point for Japanese forays against Korea and China. In the 7th century, frontier guards called Sakimori were stationed and signal fires prepared on Tsushima Island and Iki Island in the Tsushima Strait as a defence against Chinese and Korean invaders.⁴⁶ In the 13th century, in the Kamakura period, the guards on Tsushima and Iki Islands fought desperately against Kublai Khan’s Mongol forces in 1274 and 1281, contributing to the failure of the attempted invasions of Kyushu.⁴⁷ Tsushima and Iki, as well as Mutsure-jima, were the home bases of the Japanese Wokou pirates who raided the Korean and Chinese coastlines from the 13th to the 16th centuries.⁴⁸ The Battle of Tsushima in May 1905, when the Japanese Combined Fleet annihilated the Russian Fleet, described at the time by Julian Corbett as ‘the most decisive and complete naval victory in history’, took place just east of Tsushima Island and north of Iki Island, as the Russian Fleet was steaming in column through the Tsushima Strait.⁴⁹

45 「六連島探検 — 自衛隊元レーダー基地編」、彦中三八ブログ [‘Exploring Mutsurejima : Former SDF Radar Station’, Hikochu 38 Blog], 4 August 2010, at blog.goo.ne.jp/hikochu38sotu/e/fe817565af03a92589fc4a77ddf1c6a6

46 Bruce Batten, ‘The Founding of Dazaifu’, 6 October 2004, at www.fukuokahistory.com/live/content/view/15/52/; Ono Yasumaru, ‘Preface to the Chronicle “Kojiki”’, at www.geocities.jp/general_sasaki/oono-yasu-eng.html

47 Richard Storry, *A History of Modern Japan* (Penguin, Harmondsworth, Middlesex, 1960), p. 40; Malcolm Kennedy, *A Short History of Japan* (Mentor, New York, 1964), pp. 59–60.

48 ‘Wokou’, Wikipedia, at en.wikipedia.org/wiki/Wokou; ‘Iki Island’, Wikipedia, at wikipedia.org/wiki/Iki_Island

49 Julian S. Corbett & Edmond J.W. Slade, *Maritime Operations in the Russo–Japanese War* (Admiralty War Staff, London 1914, reprinted by Naval Institute Press, Annapolis, Maryland, 1994), Vol. 2, p. 333; David C. Evans & Mark R. Peattie, *Kaigun*, p. 124.

The JMSDF has three primary stations on Tsushima, comprising a large HQ base (at Mitsushima) and two shore stations for undersea surveillance systems (at Kami-tsushima and Shimo-tsushima), and several support facilities. Five LQO-3 hydrophone arrays were installed in the Tsushima Strait in 1968–72, including two in 1968 and one in 1972, connected to the two shore stations on Tsushima as well as a third station on Iki Island.⁵⁰ Seven LQO-4 systems were installed in the early 1980s, at which time a US Navy SOSUS system was ‘also deployed’.⁵¹

The Tsushima Coastal Defense Group HQ is located at Takeshiki harbour in Mitsushima, on the north-eastern side of the south island. Takeshiki harbour was established as a torpedo boat base in 1886. After the Sino–Japanese war in 1894, it became a strategic port for forward defence against Russia. The Tsushima Defense Office of Sasebo Base was established at Mitsushima/Takeshiki in December 1954. It was renamed Tsushima Coastal Defense Detachment of Sasebo Base in March 1960. It became Tsushima Coastal Defense Group HQ in March 1970, at which time it assumed operational command of the three SOSUS shore stations at Kami-tsushima, Shimo-tsushima and Iki Island. The HQ has microwave links to two microwave relay stations, one located at Gongen-yama, near Iduhara, which was established in January 1966, and which provides a direct link with the Shimo-tsushima station at Iduhara, and the other at Shirotake, which was built in November 1966.⁵²

The Kami-tsushima station is located in Kami-tsushima town, in Ooura district, at the north-western end of the north island. It has been described as ‘a real creepy place that’s sort of an island just at the top of Tsushima’.⁵³ It had previously been the site of the massive ‘Toyo battery’ and associated observatory, built in 1934 to command the Korea Strait.⁵⁴

The JMSDF’s Kami-tsushima station was established as an Observation Unit of the Sasebo Regional District HQ, with a surveillance radar, ELINT equipment and a first-generation hydrophone array, in 1960. It became the Kami-tsushima Guard Station of Sasebo Base in 1967 and a subsidiary station of the Tsushima Coastal Defense Group HQ in March 1970.⁵⁵ In the late 1960s, beginning on

50 Naoaki Usui, ‘Japan Plans to Bolster Already Formidable ASW Ability’, p. 14; 第067回国会、沖縄及び北方問題に関する特別委員会、第1号、昭和四十六年十二月二十八日 [67th Diet, Special Committee on Okinawa and the Northern Problem, 18 December 1971], at kokkai.ndl.go.jp/SENTAKU/sangii/n/067/1650/06712281650001c.html

51 ‘White Paper: Nuclear War and the Self-Defense Forces’, at www.dtic.mil/cgi-bin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA349828

52 「対馬防備隊」 [‘Tsushima Defense Group Headquarters’], Wikipedia – Japanese, at

ja.wikipedia.org/wiki/%E5%AF%BE%E9%A6%AC%E9%98%B2%E5%82%99%E9%9A%8A

53 ‘Crisscross Discussion’ on ‘Officer Being Investigated for Trips to China Found Hanged on MSDF Destroyer in Sasebo’, 10 August 2006, at www.crisscross.com/jp/news/381183

54 「上対馬警備所」、長崎平和委員会 [‘Kamitsushima Guard Station’, Nagasaki Peace Committee], at www7b.biglobe.ne.jp/~chi-tan/kamitsushima.html

55 *ibid.*

9 August 1966, the station reported several instances of intrusions by Soviet warships into Japanese territorial waters, but the JMSDF lacked the requisite capability to effectively respond.⁵⁶

The Kami-tsushima station occupies an area of nearly 33,000 square metres, on a hilltop about 120 metres above sea level. The operations building has two storeys, with a radar room and ELINT processing equipment on the first floor, and a 'monitoring room' with a 'sophisticated telescope' on the second floor. It is connected to a SOSUS-type array consisting of 'hundreds of ultra-low-frequency acoustic detection sensors' fixed to the seabed across the northern end of the Korea Strait. A heliport was built at the station in 1975.⁵⁷

The station had at least 19 antenna systems, located on the roof of the operations building and atop adjoining structures, in October 2010. These consisted of a hemispherical ELINT/ESM radome, similar to those at nearly all the JMSDF's ELINT stations; a large cylindrical radome; two conical radomes (presumably containing omnidirectional ESM/DF systems monitoring radar emissions, with a DF accuracy of 5–10 degrees); a 4-element VHF DF system and a 4-element UHF DF system; a marine surveillance radar; six large crossed VHF LPAs, two pointing towards the west, two to the north-west, and two to the south-west; a small 'box'-type UHF antenna system; two HF/VHF poles; two small cylindrical systems; and a microwave dish for local communications (see Plate 17). In addition, there is an associated tower with another hemispherical ELINT/ESM radome and two microwave dishes at Kin, in the northeast part of the north island.

The Shimo-tsushima station is situated about 8 kilometres south of Iduhara, or about 20 kilometres south of Mitsushima, in Agami district, about midway along the eastern side of the south island. During the Second World War, the site housed a fortified artillery battery. The Shimo-tsushima Guard Station was established in March 1969. It was initially directly controlled by the Sasebo Regional District HQ, but in March 1970 it became subordinate to the Tsushima Coastal Defense Group HQ at Mitsushima. It has a branch office at Hisadamati in Iduhara-cho. It cooperates closely with the Iki Island Guard Station.⁵⁸

The operations building of the Shimo-tsushima station is located on a hilltop about 2 kilometres from the living quarters. The Shimo-tsushima station was reportedly equipped with an LQO-3 hydrophone array in 1972.⁵⁹ Photographs taken by peace activists show at least seven antennas on the roof of the main

56 Auer, *Postwar Rearmament*, p. 167.

57 「上対馬警備所」、長崎平和委員会 [‘Kamitsushima Guard Station’, Nagasaki Peace Committee], at www.7b.biglobe.ne.jp/~chi-tan/kamitsushima.html

58 「下対馬警備所」、長崎平和委員会 [‘Shimotsushima Guard Station’, Nagasaki Peace Committee], at www.7b.biglobe.ne.jp/~chi-tan/shimotsushima.html

59 ‘Sea-bottom Cable-laying Ship Operating Offshore’.

building, including an ELINT/ESM radome. There are also several antennas on an adjoining tall tower, including three microwave dishes and an ESM system at the top (see Plates 18 and 19). Two of the microwave dishes are directed at the Gongen-yama relay station, while the third points towards relay stations at Ikarikuma-yama and Tsutsu-Ozaki-yama. A heliport was also built at the station in 1975.⁶⁰ An associated tower with a hemispherical ELINT/ESM radome and a microwave dish is located at Tsutsu, in the south-west part of the south island (see Plate 20).

The JGSDF also has two 'coastal monitoring training areas' on Tsushima Island, one located at Mitsushima and the other at Kami-tsushima.⁶¹ The Mitsushima facility was established in 1956, with an area of 33,054 square metres; this was increased to 96,791.31 square metres in 1986, and to 260,709.54 square metres around 2002. The facility includes a training ground used for 'coastal monitoring field exercises', a 'coastal warning and surveillance capability', and a combat unit with a 'limited ability to protect the coastal region'.⁶²

It was revealed in August 2006 that the capabilities and operations of the JMSDF's surveillance facilities on Tsushima may have been seriously compromised. A 45-year-old Petty Officer First Class, who had worked as a communications officer at the Kami-tsushima Guard Station from April 2004 to July 2006, was transferred to Sasebo, suspended from duty, and placed under investigation for suspected divulgence of secrets to Chinese intelligence agents. The officer had made eight trips to Shanghai between January 2005 and March 2006, where he was having an affair with a hostess at a karaoke club used by Chinese intelligence for 'honey trap' operations. A search of his private residence in April found 'large quantities of CDs containing pictures of military warships

60 「下対馬警備所」、長崎平和委員会 [‘Shimotsushima Guard Station’, Nagasaki Peace Committee], at www7b.biglobe.ne.jp/~chi-tan/shimotsushima.html

61 「県内自衛隊施設数量の詳細」長崎平和委員会 [‘Details of SDF Facilities in Nagasaki Prefecture’], 31 March 2003, at www1.linkclub.or.jp/~chi-tan/nsdf022.html

62 ‘Coastal Monitoring Field Training’, at www1.linkclub.or.jp/~chi-tan/gozaki.html; [郷崎沿岸監視訓練場] in 「所管換協議書」ながさき平和委員会 情報開示請求文書第49号 [‘Jurisdiction Conversion Consultation Document’], Nagasaki Peace Committee, Information Disclosure Request Document No. 49, at www7b.biglobe.ne.jp/~chi-tan/gozaki.html; 「下対馬警備所」、長崎平和委員会 [‘Shimotsushima Guard Station’, Nagasaki Peace Committee], at www7b.biglobe.ne.jp/~chi-tan/shimotsushima.html; 「県内自衛隊施設数は169、件数は減少したが機能は強化」[‘SDF Facilities in the Prefecture Decline to 169, but Their Functions are Enhanced’], *Nagasaki Peace Committee News*, 2 October 2002, at www7b.biglobe.ne.jp/~chi-tan/news/news021019.html; 「県内自衛隊施設数量の詳細」、長崎平和委員会 [‘Details of SDF Facilities in the Nagasaki Prefecture’, *Nagasaki Peace Committee News*], 31 March 2001, at www7b.biglobe.ne.jp/~chi-tan/nsdf002.html; 「陸自郷崎訓練場が拡張へ」、長崎平和委員会 [‘GSDf Gozaki Training Station is to Expand’], *Nagasaki Peace Committee News*, 21 February 2002, at www7b.biglobe.ne.jp/~chi-tan/news/news020221.html

and submarines of neighbouring countries, information about Japan's acoustic monitoring system, the seabed facilities of the Japan–Korea Strait', and the sound and magnetic signatures of Chinese, North Korean and Russian submarines.⁶³

According to a Russian account:

[The officer] served in a secret technical department on the strategically important islands of Tsushima. The department, in close cooperation with the US, maintains the SOSUS system.

SOSUS is a network of sensors and sonars at the bottom of the Korea Strait where Russian, Chinese, and North Korean ships and submarines very often pass. The system records the noises they produce, and makes a friend–foe distinction. Such data might be very useful in planning military and intelligence operations. The data is jointly shared by armed forces of the US and Japan ...

Japanese and American special technical services began making changes to the SOSUS system, suspecting some of its characteristics became known to China.⁶⁴

Wakamiya, Iki Island

Iki Island lies between Kyushu and the Tsushima Islands, in the eastern channel of the Korea Strait. It is 50 kilometres from Shimo-tsushima at the southern end of Tsushima Island, and 16 kilometres across the Iki Strait from north-west Kyushu. The JMSDF station is located at Katsumoto on Wakamiya Island, a small outcrop off the north-west shore of Iki Island. It monitors both surface vessels and submarines passing through the Tsushima Strait.⁶⁵

Iki has been regarded as a 'keystone' of the defence of southern Japan for many centuries. As with Tsushima Island, Iki Island was a founding base of the *Sakimori* frontier guards established in the 7th century to provide defence against Chinese and Korean invaders;⁶⁶ its guards featured in the battles against

63 'MSDF Officer Quizzed Over China Trips: Petty Officer had Classified Information on Foreign Military Vessels at Home', *Yomiuri Shimbun*, 2 August 2006, at www.yomiuri.co.jp/dy/national/20060802TDY02011.htm; 'New Scandal Erupts at MSDF', *Asahi Shimbun*, 3 August 2006, at www.asahi.com/english/Herald-asahi/TKY200608030062.html; Ren Zihui, 'Japanese Self Defense Force Officer Suspected of Divulging Secrets', *Epoch Times*, 4 August 2006, at www.theepochtimes.com/news/6-8-4/44611.html

64 'Japan Discovers Noise Leakage', *Kommersant*, 3 August 2006, at kommersant.com/page.asp?idr=1&id=694770

65 「壱岐警備所」長崎平和会 [Iki Guard Station', Nagasaki Peace Committee], at www.7b.biglobe.ne.jp/~chi-tan/iki.html

66 Batten, 'The Founding of Dazaifu', at www.fukuokahistory.com/live/content/view/15/52/; Ono Yasumaru, 'Preface to the Chronicle "Kojiki"', at www.geocities.jp/general_sasaki/oono-yasu-eng.html

the Mongol invaders in the 13th century⁶⁷ and it was a major base of the *Wakou* pirates who raided China and Korea in the 13th and 14th centuries.⁶⁸ In 1641, in the Edo period, a watch post and lighthouse were installed at Wakamiya by the Hirado Domain, having closed the area to foreign traders following rebellions by Japanese Christians encouraged by contesting Dutch, Spanish and Portuguese missionaries. Around 1942, or soon after Japan entered the Second World War, Iki Fortress Command was established, with 15-centimetre artillery emplacements, to strengthen the defences of the Tsushima Strait.

The modern history of the Iki station began in March 1963, when the Iki Guard Unit was officially established as a section of the Sasebo Regional District HQ. Construction of the HQ building and barracks at Wakamiya was completed in April 1963. The unit became operational in October 1963, at which time it had 21 personnel. It was named the Iki Guard Station in 1966. In March 1970, new command arrangements were instituted whereby it was subordinated to the Tsushima Coastal Defense Group HQ at Mitsushima. It has cooperated closely with the Shimo-tsushima Guard Station since the latter became operational in 1969–70. An LQO-3 array was presumably installed at around this time. ‘Brand new’ barracks were built at the station in the late 1990s.⁶⁹

The operations area consists of two, two-storey buildings. Photographs taken in October 2005 show two hemispherical ESM radomes on the top of the buildings, as well as a VHF antenna and several other antenna systems (see Plate 21).⁷⁰

A JCG facility, with a lighthouse and a HF ground-plane antenna (which transmits on a frequency of 1670.5 kilohertz (KHz)), is located directly above the JMSDF station. Located on its premises is a tower with five microwave dishes mounted on the sides and a platform with four VHF antennas. A smaller tower with another microwave dish is situated nearby.⁷¹

Another tower with four microwave dishes is located in the middle of Wakamiya Island, on a mountain top above the new barracks. Two of the dishes are directed at Tsushima Island. The other two point towards Sasebo.⁷²

67 Storry, *A History of Modern Japan*, p. 40; Kennedy, *A Short History of Japan*, pp. 59–60.

68 ‘Wokou’, Wikipedia, at en.wikipedia.org/wiki/Wokou; ‘Iki Island’, Wikipedia, at wikipedia.org/wiki/Iki_Island

69 「壱岐警備所」長崎平和会 [‘Iki Guard Station’, Nagasaki Peace Committee], at www7b.biglobe.ne.jp/~chi-tan/iki.html

70 「日本の端 (岬 / 灯台) - 8」、『のんびりし』 「[‘The Edge of Japan (Capes and Lighthouses)’, Part 8], at charider.cside2.com/Nonbiri/nihon/edge8.html

71 ‘Iki Patrol Base’, at www6.kaiho.mlit.go.jp/fukuoka/kisyuu/wakamiya/wakamiya2.htm

72 「壱岐警備所」長崎平和会 [‘Iki Guard Station’, Nagasaki Peace Committee], at www7b.biglobe.ne.jp/~chi-tan/iki.html

Kogozaki Coastal Defense Station

Kogozaki is located near Tarawagaura, on the northern side of the narrow entrance to Sasebo Bay and through to Omura Bay. It was previously an Imperial navy base and, indeed, traces its defence history back to 1714 in the Edo period. The base was taken over by the US Navy in September 1945. A defensive anti-submarine net was laid during the Korean War to monitor and prevent submarine entry into Sasebo harbour. On 2 December 1957, the United States agreed to provide the JMSDF with equipment for installation at both Kogozaki and Kannon Zaki, and a JMSDF post at Kogozaki was established on 16 May 1958. It was officially opened by the JMSDF as Kogozaki Coastal Defense Station in March 1959, and for the next decade was jointly operated with the US Navy. It was transferred to the JMSDF in May 1969. The station was closed in June 1990, but the buildings were maintained for close to another decade. The operations building had a large windowed visual observation deck, with several antennas on the roof; other antennas were mounted on masts and a tower nearby.⁷³

By the early 2000s, however, the buildings had fallen into disrepair. Photographs taken in October 2009 show that all the monitoring equipment had been removed and the rooms were littered with rubbish, but the desks, bookshelves, electrical fittings and antennas were still in place.⁷⁴ (When the site was visited in October 2010, the access road was overgrown and it was impossible to reach by car and extremely difficult even by foot.)

On the other hand, situated on the south-western side of the old operations building is a remotely controlled oceanographic navigation system for monitoring surface and submarine traffic in the Hario Strait, which, at just 260 metres wide, is the entrance to Sasebo Bay and Omura Bay.⁷⁵ The system, produced by the Zeni Lite Buoy Company and installed in 1993, is operated by the Regional Coast Guard's Unit No. 7 (see Plate 22).⁷⁶ Hydrophones are moored to the floor of the

73 「向後崎警備所」長崎平和会 [‘Kogozaki Guard Station’, Nagasaki Peace Committee], at www7.biglobe.ne.jp/~chi-tan/kogozaki.html; 「掃海部隊の歴史」、掃海隊群、海上自衛隊 [‘History of Mine-Sweeper Units’, Mine-Sweeper Group, JMSDF], at www.mod.go.jp/msdf/mf/history/index.html

74 ‘JMSDF 監視所 Part 1 – Abandoned Buildings to Monitor the Intruder’, 29 November 2009; ‘JMSDF 監視所 Part 2 – Ruins of Black and White Photos’, 29 November 2009; and ‘JMSDF 監視所 Part 3 – Maritime Self-Defense Monitoring Station was Abandoned’, 6 December 2009, *Forbidden Kyushu*, at forbiddenkyushu.wordpress.com/category/%E5%BB%83%E5%A2%9F/jmsdf%E7%9B%A3%E8%A6%96%E6%89%80/

75 「俵ヶ浦半島 向後崎灯台と船番所」、つぐみの笑顔 [‘Tawaragauru Peninsula, Ship Guard Station and Kogozaki Lighthouse’, Smile of the Thrush], 16 March 2012, at blogs.yahoo.co.jp/yamamuraren/archive/2012/03/16

76 Zeni Lite Buoy Company, ‘Company Events, Fiscal Year 1993’, at www.zenilite.co.jp/topics/p14.html

narrow strait. A ‘wide-field camera’ attached to the shore facility photographs all surface vessels transiting the strait, while the hydrophones detect and identify the sources of underwater sounds.⁷⁷

White Beach, Okinawa

The JMSDF’s Okinawa Ocean Observation Station is located at the White Beach Naval Facility in Katsuren, in Uruma City, on the eastern side of Okinawa Island. The White Beach base was transferred from the US Navy to the JMSDF in 1973, although the US Navy has retained use of its facilities. The Ocean Observation Station, maintained by the JMSDF’s Oceanographic Command, reportedly has a SOSUS array, moored ‘several hundred km’ from the station.⁷⁸ An observation/surveillance building at the base, which flies both the Japanese and US flags, has a large visual observation room, with a marine search radar and several other antennas on the roof. A 7-metre diameter radome, mounted on top of a 15-metre high tower, is situated on the hill above the base. It presumably contains radar and/or ELINT equipment.

The small White Beach base, with little berthing space, is usually visited by the US Navy’s ocean surveillance/SURTASS ships whenever they are operating in the area. These visits were infrequent, occurring once or twice each year, until 2007, when the rate increased markedly and, by the end of the year, began to happen monthly. For example, the *Victorious* (T-AGOS 19) visited in August and October 2004, and again in February 2008.⁷⁹ The *Loyal* (T-AGOS 22) visited in April 2007, August 2007, December 2007 and again in January 2008.⁸⁰ The *Impeccable* (T-AGOS 23), the newest of the US Navy’s five SURTASS ships, and

77 See, for example, Motonobu Imasato, Nobuo Kiriya, Hiroshi Asou, Osamu Toyama & Kuniyuki Matsushita, ‘Development of Marine Surveillance Technology by Sensing Underwater Sound’, *Journal of the Japan Institute of Marine Engineering (JIME)* (Vol. 46, No. 1), 2011, at www.mesj.or.jp/publication/award_paper/ap_papers/pdf/2011AP3.pdf

78 「沖縄海洋観測所」、地球探検の旅 [‘Okinawa Ocean Observatory’ Journey to Explore the Earth], 19 February 2008, at earthjp.net/mercury/0802190004.html; 「沖縄基地」 [‘Okinawa Bases’], Wikipedia – Japanese, at ja.wikipedia.org/wiki/%E6%B2%96%E7%B8%84%E5%9F%BA%E5%9C%B0

79 「音響測定艦がもう一隻いた – ビクトリアス、ホワイトビーチに寄港」 [‘One Acoustic Measurement Ship, and then Another – Victorious Enters White Beach’], Rimpeace, 18 January 2008, at www.rimpeace.or.jp/jrp/okinawa/041124wb.html

80 音響測定艦、駆逐艦、揚陸艦がWBに同時入港 [‘Acoustic Measurement Ship, Destroyer, Landing Ship Simultaneously Enter Port at White Beach’], Rimpeace, 13 April 2008, at www.rimpeace.or.jp/jrp/okinawa/080413wb.html; 「音響測定艦ロイヤル、ホワイトビーチに寄港」 [‘Acoustic Measurement Ship Royal Enters White Beach’], Rimpeace, 18 January 2008, at www.rimpeace.or.jp/jrp/okinawa/070815loyal.htm; 「音響測定艦、那覇軍港に交代寄港」 [‘Acoustic Measurement Ships Alternate Calls at Naha Port’], Rimpeace, 22 July 2007, at www.rimpeace.or.jp/jrp/okinawa/0712tagosnaha.html

the first to be equipped with a low-frequency active (LFA) system, visited in October 2007 and then joined the *Loyal* at White Beach in January 2008.⁸¹ The *Effective* (T-AGOS 21) visited in March and in April 2008.⁸²

There is compelling evidence that a new SOSUS array was laid by the US Navy from Kyushu to Okinawa, and connected to White Beach, in 2006. In late 2004, the US Navy's cable-laying ship, the *Zeus* T-ARC 7, began operating in the waters between Kyushu and Okinawa; it visited Sasebo in October, November and December 2004.⁸³ Then, from January through December 2006, it visited Sasebo 13 times, operating closely with five US Navy oceanographic surveying ships (*Bowditch*, *Bruce C. Heezen*, *John McDonnell*, *Mary Sears* and *Sumner*), and with 10 Los Angeles-class nuclear-powered attack submarines (SSNs), according to records of their port calls to Sasebo and White Beach. Rimpeace, the group of Japanese base-watchers which catalogued the coincidental arrival and departure dates of these vessels at Sasebo and White Beach, stated that the US Navy had previously maintained a SOSUS system around Okinawa to monitor Soviet submarines, but that it had been 'shut down' after the end of the Cold War due to its high operational costs. It argued that the new system is intended to monitor Chinese Navy movements into the Pacific Ocean.⁸⁴

81 「音響測定艦の主な活動海域」[Areas of Acoustic Measurement Ship's Main Activities'] Rimpeace, 21 December 2007, at www.rimpeace.or.jp/jrp/umi/northd/lfaoperation.htm; 「LFAソナー搭載艦2隻、那覇軍港に同時寄港」[Two LFA Sonar-equipped Ships in Simultaneous Call at Naha Naval Base'], at www.rimpeace.or.jp/jrp/okinawa/080123lfalfa.html

82 「音響測定艦工フェクティブ、WBに短時間寄港」[Acoustic Measurement Ship "Effective" Calls Briefly at White Beach'], at www.rimpeace.or.jp/jrp/okinawa/080314effective.html; 「音響測定艦工フェクティブ、那覇、WBに連続寄港」[Acoustic Measurement Ship in Continuous Port Calls at Naha and White Bay'], Rimpeace, 13 April 2008, at www.rimpeace.or.jp/jrp/okinawa/080407tagos21.html

83 「ケーブル敷設艦・測量艦の佐世保入港増加の意味は？」[What is the Significance of Increased Port Visits by Cable-laying Ships and Surveying Ships?], at www.rimpeace.or.jp/jrp/sasebo/sasebobase/0608ssbzeusags.html

84 *ibid.*

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