The Nautilus Institute *for Security and Sustainability*

Japan's Signals Intelligence (SIGINT) Ground Stations: A Visual Guide

Desmond Ball and Richard Tanter

Nautilus Institute for Security and Sustainability
Special Report
6 August 2015

Summary

This is a study of Japan's ground-based signals intelligence (SIGINT) stations, the 17 (soon to be 19) major facilities that intercept, monitor, collect, process and analyse foreign electronic signals. Official statements convey nothing of the scale or detail of the Japanese SIGINT effort, which is probably the third or fourth largest SIGINT establishment in the world. These Japanese ground signals interception and location facilities are integrated with its air and missile defence radar facilities. Together with Japan's own long-range underwater surveillance systems, and combined with the Japan-based US parallel air, ground and underwater surveillance systems, they take Japan a very long way towards its stated aim to ensure information supremacy in the region. As potentially lucrative targets in the event of war, destruction of these important but vulnerable facilities could alter escalation dynamics in such a way that the widespread assumption that a Japan-China armed conflict could be controlled before substantial escalation may not hold true.

This report is a visual guide, hopefully making it easier for those come after us to identify what they are seeing. Similar and comparable systems are critical to the strategic planning of all countries with substantial military capacities – or ambitions. Accordingly an understanding of the Japanese ground stations, their physical characteristics, and the logic of their deployment may be of use in understanding non-Japanese systems.

Authors

Desmond Ball is Emeritus Professor at the Australian National University (ANU). He was a Special Professor at the ANU's Strategic and Defence Studies Centre from 1987 to 2013, and he served as Head of the Centre from 1984 to 1991.

Richard Tanter is Senior Research Associate at the Nautilus Institute and Honorary Professor in the School of Political and Social Sciences at the University of Melbourne.

Recommended Citation: Desmond Ball and Richard Tanter, 'Japan's Signals Intelligence (SIGINT) Ground Stations: A Visual Guide,' Nautilus Institute NAPSNet Special Report, 6 August 2015, at http://nautilus.org/napsnet/napsnet-special-reports/japans-signals-intelligence-sigint-ground-stations-a-visual-guide

Note that the authors' high resolution photographs used in the plates will be available in the Nautilus photostream on the Panoramio website with geolocation in due course.

Contents

List of plates

I

Acknowledgements

The authors are very grateful to several friends and colleagues who assisted us with this project. Our interest in Japan's signals intelligence (SIGINT) capabilities and activities was in large part inspired by two peace researchers, Sato Yuji and Owen Wilkes, who in the 1980s comprehensively and systematically studied all of Japan's major SIGINT facilities. Both are now long dead, but we have been fortunate to inherit copies of most of the material they collected. Jeffrey T. Richelson, a world authority on US and foreign intelligence organisations, generously gave us copies of much relevant material. Sakemi Tatsumasa, a member of the Fukuoka Prefecture Peace Committee, who died in 2012, provided us with detailed information concerning developments at the SIGINT stations at Tachiarai and Seburi-yama in Kyushu over several preceding years. Tokumoto Hiraku, Maruyama Kuniaki, and Ohguchi Bak helped us in Kikaijima. Kim Keukmi provided us with wonderful research support. Bill Robinson has been unsparing in his assistance. He has made his holdings of satellite imagery available to us, and calculated the dimensions of many of the antenna elements described herein. Olivia Cable, a Research Assistant in the Coral Bell School of Asia Pacific Affairs at the Australian National University, assisted with the preparation of the Plates. Rebecca Pollack in the Nautilus Institute office assisted with the preparation of the final manuscript and with the preparation of the authors' photos to be available in due course on the Panoramio website.

Desmond Ball also wishes to thank his wife, Annabel Rossiter, and his children Katie, Matthew and James, for their love and forebearance. Richard Tanter wishes to thank Luisa Macmillan and Kai and Nathaniel Tanter for their love, patience and support over the long haul of this project, and Luisa especially for the gift of time to complete this work.

Acronyms and Abbreviations

ADIZ	Air Defence Identification Zone
ASA	US Army Security Agency
CDAA	Circularly-disposed Antenna Array
COMINT	communications intelligence
COMSAT	communications satellite
DF	direction-finding
DIH	Defense Intelligence Headquarters
ECM	Electronic Counter Measures
ELINT	electronic intelligence
Es	Sporadic E layer
ESG	US Electronic Security Group
FY	Fiscal year (1 April – 31 March)
HF	high frequency (3 – 30 MHz)
HF DF	high frequency direction-finding
HQ	Headquarters
IOC	initial operational capability
JADGE	Japan Air Defense Ground Environment
JASDF	Japan Air Self Defense Force
JDA	Japan Defense Agency
JCG	Japan Coast Guard
JGSDF	Japan Ground Self Defense Force
JMSDF	Japan Maritime Self Defense Force
JSDF	Japan Self Defense Force
LPA	log-periodic antenna
MoD	Ministry of Defense
MTDP	Mid Term Defense Plan
NSA	US National Security Agency
NSG	US Naval Security Group
NSOC	National SIGINT Operations Center
PMEL	Precision Measurement Equipment Laboratory
RGM	Radio Group Mobile
RSM	Radio Group Squadron
Satcom	satellite communications
SHF	super high frequency (3 – 30 GHz)
SIGINT	signals intelligence
SWAT	Signal-processing and Wave-sensing Technology

USAFSS	US Air Force Security Service
UHF	ultra high frequency (300 MHz – 3 GHz)
UKUSA	United Kingdom – United States of America agreement
VHF	very high frequency (30 – 300 MHz)
YIG	Yittrium-Iron-Garnet crystal tuning filters

Table 1. Japan's Signals Intelligence (SIGINT) Ground Stations

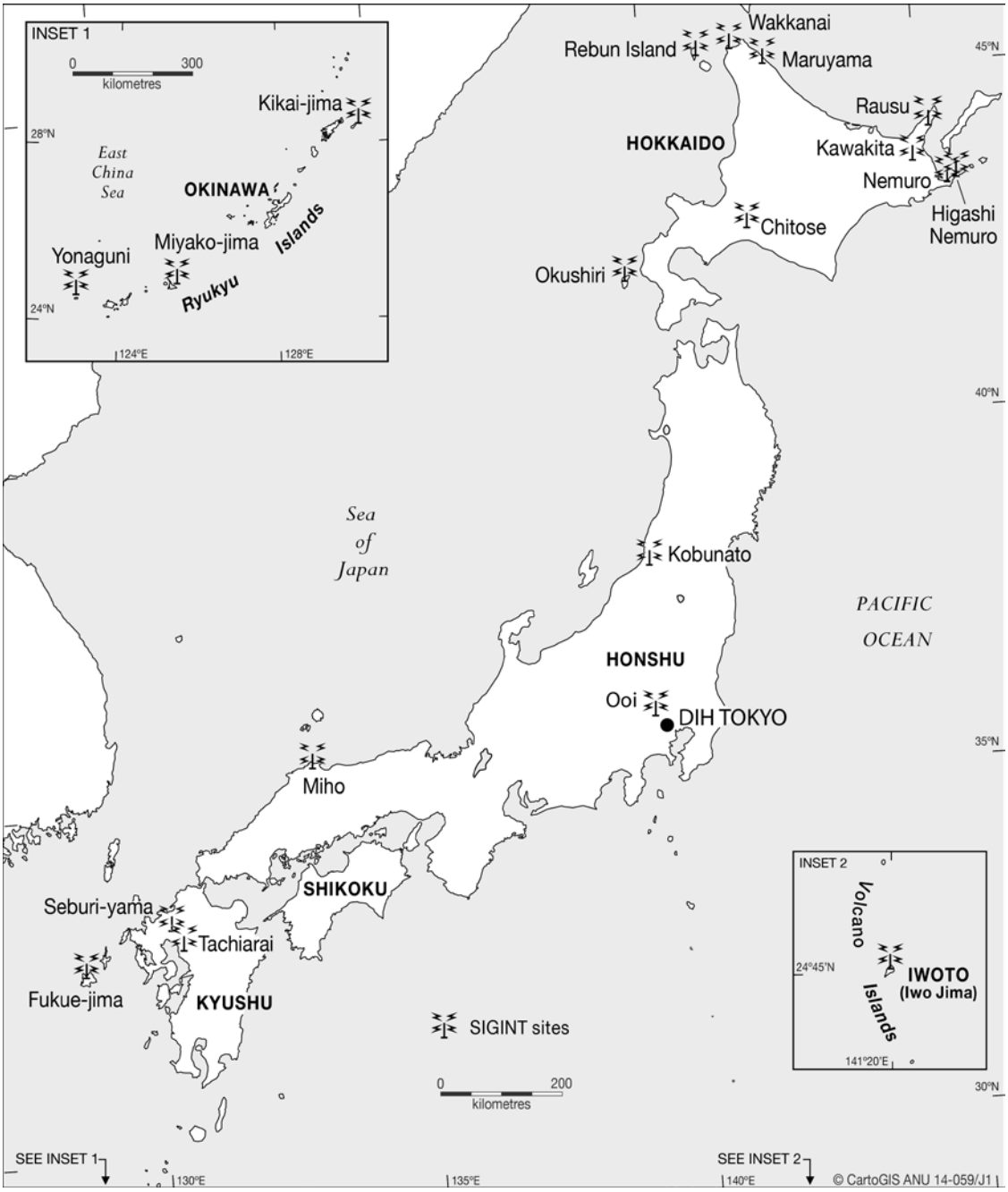
	Site	Location	Units	History
1.	**Wakkanai** [稚内], Hokkaido	45.439819° 141.650714°	JASDF Air Intelligence Collection Unit No. 1. JGSDF 301 Coastal Surveillance Unit. JGSDF 2nd Defence Intelligence Division Detachment. JMSDF Detachment.	Former US station, transferred to the Chobetsu in 1972. JGSDF station established in 1955. Organisationally a detachment of the Higashi Chitose station. Monitored shooting down of KAL 007 on 31 August 1983. US AN/FLR-12 panoramic data collection system installed in 1965-66. JGSDF 301 Coastal Surveillance Unit maintained a 36-element HF DF CDAA from1988 to 2009. New 7-element HF DF array constructed in 2009.
2.	**Maruyama, Cape Soya [丸山, 宗谷岬]**, Hokkaido	45.485854° 141.929935°	Detachments from Wakkanai: JGSDF 301 Coastal Surveillance Unit; and JASDF Air Intelligence Collection Unit No. 1.	Established on 1 November 1981.
3.	**Rebun Island** [礼文島], Hokkaido	45.436743° 141.052006°	Detachment of JGSDF 301 Coastal Surveillance Unit at Wakkanai.	
4.	**Shibetsu [標津]**, Hokkaido	43.694627° 144.928807°	JGSDF 302 Coastal Surveillance Unit.	Main operations base is at Kawakita, 19 km west of Shibetsu. Also maintains facilities at Rausu and Nemuro.
5.	**Rausu [羅臼]**, Hokkaido	44.014788° 145.184066°	Detachment of JGSDF 302 Coastal Surveillance Unit at Shibetsu.	
6.	**Higashi Nemuro [東根室]**, Hokkaido	43.314186° 145.599200°	JGSDF Detachment from Higashi Chitose.	
7.	**Nemuro [根室]**,	43.337604°, 145.616034°	JASDF Air Intelligence	J/FLR-2 panoramic data collection system installed in the 1980s.

	Hokkaido		Collection Unit No. 2. JGSDF 302 Coastal Surveillance Unit.	JGSDF 302 Coastal Surveillance Unit facility established in 1993. JGSDF 302 Coastal Surveillance Unit maintained a 36-element CDAA at Higashi Nemuro (43.308528°, 145.600522°) from 1991-92 to 2011. New 7-element HF DF array constructed in 2010 (43.341843°, 145.610275°).
8.	**Higashi Chitose [東千歳]**, Hokkaido	42.856210° 141.723204°	DIH	Former US station, transferred to the Chobetsu in 1971. Wullenweber CDAA, identical to Miho, installed in 1987. Smaller 8-element CDAA installed by 2009. Monitors Russian signals. Four Satcom radomes for monitoring Russian communications satellites (COMSATs).
9.	**Okushiri Island [奥尻島]**, Hokkaido	42.1536409° 139.434587°	JGSDF Detachment from Higashi Chitose. JASDF Air Intelligence Collection Unit No. 3.	Plans for construction announced in December 1983. Became fully operational in May 1990. Expanded in 1991-93. Designed to monitor communications in the Russian Far East. J/FLR-3 panoramic data collection system, with two antenna-bearing towers and 11 radomes.
10.	**Kobunato [小舟渡]**, Niigata Prefecture	37.965836° 139.317417°	DIH	Monitors Russian Far East. 36-element CDAA installed in 1988. Replaced by a new 7-element HF DF array in 2009.
11.	**Miho [美保]**, Tottori Prefecture	35.509959° 133.224635°	DIH	Monitors North Korean signals. Wullenweber CDAA, identical to Higashi Chitose, operational in December 1977. Ancillary COMINT unit at Takao-yama reported in 1998.
12.	**Ooi [大井]**, Saitama Prefecture	35.855727° 139.485426°	DIH	Established in 1953. Two large radomes (about 20-m diameters) installed in the 1990s. Third large radome (about 30-m diameter) installed in 2008-09. 8-element HF DF system.
13.	**Tachiarai [大刀洗]**, Fukuoka Prefecture	33.441796° 130.602573°	DIH	Established in 1961. Monitors China and North Korea. Six large and five small radomes. 8-element HF DF system dismantled in 2007. Replaced by a

				new 7-element HF DF array in 2007-08 (identical to those later constructed at Kobunato, Wakkanai and Nemuro).
14.	**Kikai-jima [喜界島]**, Kagoshima Prefecture	28.302007° 129.965904°	DIH	Monitors China. Established at Akuren in 1962. Seven 40-metre HF antennas. 8-element Adcock HF DF system. 50 personnel in 1998. Large CDAA at Kawamine achieved initial operational capability (IOC) in March 2006. Completely operational in 2008-09. 200 personnel in December 2013.
15.	**Seburi-yama [背振山]**, Saga Prefecture	33.436916° 130.368842°	JASDF Air Intelligence Collection Unit No. 4.	J/FLR-4 panoramic data collection system installed in 2004-06.
16.	**Fukue-jima [福江島]**, Nagasaki, Prefecture	32.761635°, 128.667897°	JASDF Air Intelligence Collection Unit.	J/FLR-4A panoramic data collection system under construction, scheduled to open in 2014.
17.	**Miyako-jima [宮古島]**, Okinawa Prefecture	24.762734° 125.326610°	JASDF Air Intelligence Collection Unit.	J/FLR-4A panoramic data collection system constructed in 2006-09.
18.	**Yonaguni [与那国]**, Okinawa Prefecture	24.449490° 122.994737°	JGSDF Coastal Surveillance Unit.	Site location to be confirmed. Scheduled to be operational in FY 2015.
19.	**Iwoto (Iwo Jima) [硫黄島]**, Ogasawara Subprefecture	24.790471° 141.325875°		Construction plans and budget for a large communications intelligence facility reported in September 2013. Scheduled to be operational in FY 2017. Location indicative only.

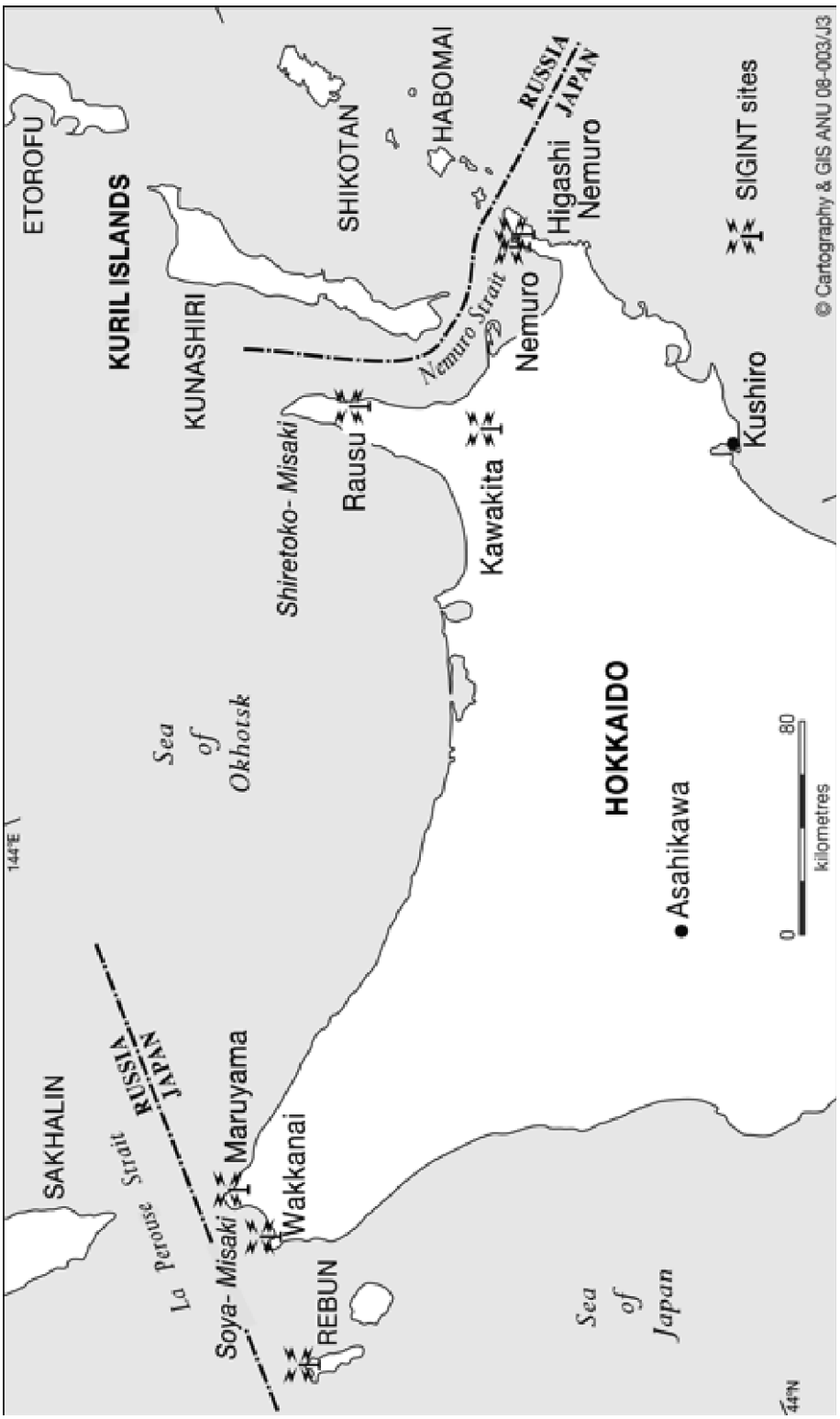
Map 1

Japan's SIGINT ground stations



Map 2

SIGINT stations in northern Hokkaido



Preface

On 6 September 1983, in what the Japan Defense Agency (JDA) described as 'an exceptional and unprecedented move', the Chief Cabinet Secretary released part of the transcribed communications of the Soviet pilots involved in the shooting down of the KAL 007 passenger plane on 1 September 1983. On 7 September, the full transcript of the Soviet pilots' communications was jointly submitted by Japan and the US to an emergency session of the UN Security Council.[1] These transcripts had been recorded at a Japanese SIGINT station at Wakkanai, on the northwestern tip of Hokkaido, which had been originally established by the NSA and transferred to Japan in 1972.[2] It was the first official revelation that Japan was engaged in SIGINT operations.

This is a study of Japan's ground-based signals intelligence (SIGINT) stations, the 17 (soon to be 19) major facilities that intercept, monitor, collect, process and analyse foreign electronic signals. These include the content, technical characteristics, and geolocation of communications emanating from sources on land, at sea, in the air, and in space, and of electronic signals emanating from other than intentional communication, such as radars.

For more than three decades, the white papers of the Ministry of Defense (and before 2007, those of the Japan Defense Agency) have included a paragraph to the effect that,

> The Ministry of Defense and the SDF comprehensively analyze and assess a variety of information, and have diversified the means of collecting intelligence, … [including, for example] collecting, processing and analyzing radio waves on military communications and radio waves emitted from electronic weapons, which are transmitted from overseas.'[3]

---

[1] Japan Defense Agency, *Defense of Japan 1984*, (Japan Defense Agency, Tokyo, 1984), p. 111.
[2] Seymour Hersh, *The Target is Destroyed: What Really Happened to Flight 007 and What America Knew About It*, (Faber and Faber, London, 1986), pp. 57-61. See also Sam Jameson, 'Disclosures on Soviet Pilots Costly to Japan's Security', *Los Angeles Times*, 19 September 1983, pp. 1, 15. A photograph of the Wakkanai SIGINT station was published in *Newsweek*, 12 September 1983, p. 25.
[3] *Defense of Japan 2012*, (Tokyo: Ministry of Defense, 2012), p. 213. The precise wording varies slightly from year to year: e.g. *Defense of Japan 2012*, (Tokyo: Ministry of Defense, 2014), p. 218. Or as in 1984: 'The SDF (Self Defense Force) monitors military communication radio waves from foreign countries coming to Japan and radio waves emitted by electronic weapons and

Each year, improvements in technical intelligence collection, including in signals intelligence, are promised:

> 'In order to enhance the capability of collecting a variety of intelligence, and comprehensively analyzing and assessing information by responding to the security environment and technical trends, the Ministry of Defense and the SDF develop capable personnel, improve equipment and devices for intelligence collection as well as strengthen the capability of intelligence organizations.'[4]

Yet these brief formulaic official statements convey nothing of the scale or detail of the Japanese SIGINT effort. With some 17 major SIGINT ground stations of various sorts and capabilities and at least 14 JMSDF ELINT stations, as well as extensive airborne and ship-based systems, it is probably the third or fourth largest SIGINT establishment in the world.[5]

The official statements give no sense that Japan's ground SIGINT stations reach from the country's northernmost point at Wakkanai within sight of Sakhalin to its easternmost point at Nemuro in sight of Russian-occupied Kurils, and when construction is complete within a year will reach from its westernmost point at Yonaguni almost in sight of Taiwan to the planned outpost on the rocky speck of Iwoto (Iwojima) in the western Pacific Ocean. These large and continually upgraded radiowave interception facilities provide Japan with the ability to detect, intercept and locate high frequency (HF) Chinese and Russian land, sea and air military transmissions from up to 5,000 kms from the Japanese coastline in all directions. Shorter range emissions in the very high frequency (VHF) and ultra high frequency (UHF) bands are effectively targeted over almost

---

equipment deployed by foreign armed forces. Information thus collected is analysed to compile data which are vital to the defence of the country.' *Defense of Japan 1984,* (Tokyo: Japan Defence Agency, 1984), p. 110.

[4] *Defense of Japan 2012*, (Tokyo: Ministry of Defense, 2012), p. 213. In 1984, the JDA stated it 'has stepped up efforts to improve its capability … to efficiently collect and analyse electronic information', and that improved 'radiowave detection devices' and other electronic intelligence collection systems have been progressively introduced into the Self Defence Forces. *Defense of Japan 1984,* (Tokyo: Japan Defence Agency, 1984),

[5] See Desmond Ball and Euan Graham, 'Japan SIGINT Takes Off', *Jane's Intelligence Review*, (Vol. 12, No. 12), December 2000, pp. 26-31; Desmond Ball and Euan Graham, 'Japan's Airborne SIGINT Capabilities', (Working Paper No. 353, Strategic and Defence Studies Centre, Australian National University, Canberra, December 2000); Desmond Ball and Richard Tanter, 'The Transformation of the JASDF's Intelligence and Surveillance Capabilities for Air and Missile Defence', *Security Challenges*, (Vol. 8, No. 3), Spring 2012, pp. 19-56; and Desmond Ball and Richard Tanter, *The Tools of Owatatsumi: Japan's Ocean Surveillance and Coastal Defence Capabilities*, (ANU Press, Australian National University, Canberra, 2015).

the entire Japanese Exclusive Economic Zone, including key passages available to Chinese and Russian ships and aircraft passing to the Pacific Ocean.

These Japanese ground signals interception and location facilities are integrated with its air and missile defence radar facilities. Together with Japan's own long-range underwater surveillance systems, and combined with the Japan-based US parallel air, ground and underwater surveillance systems, they take Japan a very long way towards its stated aim to 'ensure information supremacy through continuous ISR [intelligence, surveillance and reconnaissance] in the country and its surrounding areas'.[6]

The JSDF began building an independent SIGINT capability in the late 1950s and early 1960s, and was soon collecting valuable intelligence about the former Soviet Union and China. For example, in 1969, the JSDF SIGINT agency monitored Soviet and Chinese communications concerning the fighting on the Ussuri River border, and by reading the Soviet tactical traffic was able to ascertain the precise point (a request for Corps-level artillery support) at which the high command in Moscow intervened to stop the fighting.[7] In September 1971, the station at Tachiarai monitored the attempted defection and death of Lin Biao, and was able to provide the government with an accurate report on the circumstances of his death 10 months before Beijing made any official announcement about 'the Lin Biao incident'.[8]

In the early 1970s, the JSDF began taking over facilities which had been constructed by the United States, such as Chitose in 1971 and Wakkanai in 1972,

---

[6] Ministry of Defense, National Defense Program Guidelines for FY 2011 and Beyond. Approved by the Security Council and the Cabinet on 17 December 2010, at http://www.mod.go.jp/e/d_act/d_policy/pdf/guidelinesFY2011.pdf>, p. 10. See also Desmond Ball and Richard Tanter, *The Tools of Owatatsumi: Japan's Ocean Surveillance and Defence*, (Canberra: ANU Press, 2015) and Desmond Ball and Richard Tanter, 'The Transformation of the JASDF's Intelligence and Surveillance Capabilities for Air and Missile Defence', *Security Challenges*, Vol. 8 No. 3 (Spring 2012). United States SIGINT facilities in Japan will be the subject of a forthcoming report.

[7] Colonel William V. Kennedy, *Intelligence Warfare*, (Crescent Books, New York, 1983), pp. 33-34.

[8] 'Japan's Sanctuary: The Defense Intelligence Headquarters', *Sentaku*, May 1997, pp. 126-129, (FBIS-EAS-97-150, Northeast Asia, 1 May 1997); 'On the Way to Securing a World Position?: Japan's Intelligence Agencies and Their Activities', *Japan Quarterly*, (Vol. XXIX, No. 2), April-June 1982, p. 161; Hamish McDonald, 'Japan to Lift its Spying Effort After Being Caught Short', *Sydney Morning Herald*, 27 October 1982; and Jeffrey T. Richelson, *Foreign Intelligence Organizations*, (Ballinger, Cambridge, Massachusetts, 1988), p. 258.

sometimes even retaining the US equipment, although more usually installing their own systems.

Its capabilities have grown steadily since then, although the systems acquired in the 1990s and their intended purposes differed from those of the 1970s and 1980s. In the early 1990s, when the SIGINT facilities on Hokkaido were expanded, the JASDF and the JMSDF had become anxious about the deployment of the Soviet Backfire bombers to the Far East and the rapid growth of the Soviet fleets at both Vladivostok and Petropavlovsk. At the same time, the Japanese intelligence authorities had also become more concerned about North Korea. And while monitoring HF and VHF radio communications was still important, there was an increasing need to monitor satellite communications as well. For the past decade and a half Japan SIGINT development has focussed on coverage both of China itself, and maritime and air space used by Chinese forces in the East China Sea, the northern parts of the South China Sea, and the western Pacific Ocean.

These are all areas of friction between the United States and Japan on the one hand and China on the other, with the possibility of armed conflict, especially over the Senkaku/Diaoyu islands, recognised and discussed as increasingly possible, whether as a result of accidental conflict or by a deliberate decision to go to war. Writing of the Japanese underwater surveillance facilities, Robert Ayson and Desmond Ball have argued that the combination of the strategic importance and vulnerability to attack of many Japanese ground-based intelligence facilities in the event of war in itself influences the strategic calculations that will be made in such an event. As potentially lucrative targets, their destruction could alter escalation dynamics in such a way that the widespread assumption that a Japan-China armed conflict could be controlled before substantial escalation may not hold true.[9] The ground signals intelligence facilities documented here must be added to those dynamics.

[9] Robert Ayson & Desmond Ball, 'Can a Sino-Japanese War Be Controlled?' Survival: Global Politics and Strategy, Vol. 56 No. 6, pp. 135-166 (2014)

This study is a descriptive one, a visual guide to Japan's still expanding network of ground SIGINT stations. While we believe that the facilities discussed here are of considerable strategic significance, our primary purpose here is not analytical. The first task is empirical description and documentation. The first research tools were a long search for documentary material in print, on the web and in the more transient form of hand-written photocopies of notes and reports by peace researchers in Japan. As we say elsewhere in this report, we were extremely fortunate to inherit published and unpublished work by two excellent peace researchers, Sato Yuji and Owen Wilkes, who between them systematically and accurately described the Japanese SIGINT network in the 1980s and early 1990s.

This led to a series of site visits, often several times repeated, to all of the facilities described here, and to information from the substantial body of local Japanese peace activists dedicated to documentation of their country's remilitarisation. Ongoing local concern and opposition to the establishment or expansion of some of these facilities meant that local newspapers covered these struggles in some detail. The internet made possible access from afar to both these news sources, and to Japanese government tendering and contract information about these facilities. The impact of GoogleEarth and similar space-based overhead imagery becomes clear when images of particular facilities are paced in a sequence with the hand drawn maps created by local activists and peace researchers on the basis of careful closeup observation over a long period of time.

All of these sources fostered an historical approach to documenting the growth of Japan's postwar ground SIGINT capacity. In the first place, geography and variable signal receptivity mean that many of today's SIGINT bases were formerly used by the United States in the postwar period, and before that by the Imperial Japanese Army and Navy. Secondly, an historical approach also means it is possible to understand the logic of development of both specific bases and their facilities, and of the network as a whole. One example documented here is the Japanese development and expansion of its major SIGINT facilities known as the J/FLR series (J/FLR-2, J/FLR-3, J/FLR-4, and J/FLR-4A) starting from its modification of the US AN/FLR-12 panoramic data collection system originally

installed at Wakkanai in 1965-66, and left behind to be modified by Japan when the US turned over that base to the Chobetsu in 1972. We provide photographs of each of these J/FLR facilities, and in a number of cases, show them in different stages of construction to gain at least some sense of their internal layout.

This report is a visual guide, hopefully making it easier for those come after us to identify what they are seeing – almost always from a considerable distance and under increasingly unfavourable legal restrictions. These facilities are specifically Japanese, and their study is firstly important for civil society and academic researchers seeking to understand the characteristics and significance of these critical elements in Japan's ISR (intelligence, surveillance and reconnaissance) systems and its C4I (command, control, communications, computer and intelligence) systems. But similar and comparable systems are critical to the strategic planning of all countries with substantial military capacities – or ambitions. Accordingly an understanding of the Japanese ground stations, their physical characteristics, and the logic of their deployment may be of use in understanding non-Japanese systems.

Few of our major sources come from academic studies of Japanese intelligence. While both of us are academics, this work both demonstrates and hopefully supports the rich tradition of work of by Japanese non-academic civil society peace researchers. The work is undertaken in a belief that while there may be certain details of the precise capacities that are of genuine national security significance, the existence and broad characteristics of intelligence facilities of the types we document here should be known to the publics of the countries they affect – in this case the Japanese public in the first instance. As a rule governments are over-zealous in their attempts to keep their citizens in the dark about these matters, and the Japanese government is less than forthcoming on defence and intelligence matters than, say, that of the United States. With US encouragement it has recently enacted legislation that will make this work somewhat more difficult in the future. At a domestic level, especially in those countries with at least ambitions of governmental accountability, an informed public is a critical foundation for robust democratic policy making. At a

international level, transparency and accessible information about actual military and intelligence capabilities tempers the fantasies of both pride and threat.

Chapter 1
Introduction

Japan's postwar signals intelligence (SIGINT) facilities were maintained from 1958 to 1997 by a small unit of the Japan Ground Self Defence Force (JGSDF) known as the Chobetsu or Chosa Besshitsu. More formally the Annex Chamber, Second Section, Second Investigation Division of the JGSDF, the Chobetsu reported directly to the Cabinet Research Office, later named the Cabinet Intelligence and Research Office. Today Japan's extensive signals intelligence (SIGINT) network of facilities are managed by the Defense Intelligence Headquarters, a special (or 'attached') organization within the Ministry of Defense, headed by an SDF lieutenant-general.

In 1978, the *Asahi* newspaper published a detailed account of Japan's SIGINT establishment, based on an interview with a senior officer of the Japan Defence Agency (JDA), which described the organisation of the Chobetsu and the location of its intercept stations, and gave some examples of their activities. The Chobetsu then managed and operated nine SIGINT stations. These were located at Wakkanai, at the northwestern point of Hokkaido; Nemuro and Higashi Nemuro, at the northeastern point of Hokkaido; Higashi Chitose in the southwestern part of Hokkaido; Kobunato and Miho on the western side of Honshu, facing the Sea of Japan; Ooi, near Tokyo; Tachiarai in northern Kyushu; and Kikai-jima in the northern part of the Ryukyu island chain, about half-way between Kyushu and Okinawa.[10] Another station was constructed on Okushiri Island off the southwest coast of Hokkaido in the 1980s. In 1991-93 there was 'a rapid expansion of Japan's ELINT/SIGINT gathering capabilities' at the main stations in Hokkaido – Chitose, Wakkanai, Nemuro, and the 'recently-established' station at Okushiri.[11] By this time, smaller stations had also been established at

[10]『新情報戦』、朝日新聞社 (編集)、1978 年 8 月発行, [Asahi Newspaper Company, *Neo-Information War*, (Tokyo: Asahi, 1978)], pp. 47, 49.
[11] See, for example『安保、自衛隊そして憲法と北海道』、日本平和大会北海道実行委員会, [*The Alliance, the SDF, the Constitution and Hokkaido*, Hokkaido Action Committee, Japan Peace Conference, October 1991], p. 14; *Asian Defence Journal*, January 1993, p. 26; and『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

Rebun Island, Maruyama, Shibetsu, and Rausu in northern Hokkaido.[12] A new large JASDF SIGINT station was built at Seburi-yama in northwestern Kyushu in 2004-06, another was completed at Miyako-jima in 2009-10, and another at Fukue-jima was scheduled for completion in 2014.[13]

There are now 17 SIGINT stations of one sort or another maintained by the DIH, JGSDF or JASDF, with an eighteenth under construction at Yonaguni, Japan's southwestern-most island, and a nineteenth at Iwoto (Iwo Jima), Japan's southeastern-most island. (See Map 1 and Table 1) Some of these are sub-stations of larger stations, but located in different areas better situated for specific monitoring functions. For example, the JGSDF's No. 301 Coastal Surveillance Unit based at Wakkanai maintains a substantial station at Maruyama, near Cape Soya, just northeast of Wakkanai, as well as on Rebun Island, in the northeast part of the Sea of Japan, west of Wakkanai. The JGSDF unit at Shibetsu, No. 302 Coastal Surveillance Unit, has facilities at Rausu, on the Shimokita Peninsula northwest of Shibetsu and slightly closer to the Russian-occupied island of Kunashiri, and at Nemuro, which is better placed for high frequency direction finding (HF DF) and some electronic intelligence (ELINT) functions. (Map 2)

The management arrangements are sometimes quite complex, involving several agencies and a variety of host-tenant relationships. In addition to the Radio-wave [or SIGINT] Department of the Defense Intelligence Headquarters (DIH) at Ichigaya, the JGSDF and the other Services also have important operational and administrative roles. The JGSDF's 2nd Defence Intelligence Division Detachment has primary responsibility for operation of the eight major SIGINT stations at Wakkanai, Nemuro, Chitose, Kobunato, Ooi, Miho, Tachiarai and Kikai-jima. The JGSDF's No. 301 Coastal Surveillance Unit is a tenant unit at

---

・18th 全道基地闘争活動者会議（93・10）[Matsui Masaru, 'Looking at New Developments and Changes in Hokkaido C^{3}I 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].

[12] Matsui, 'Looking at New Developments and Changes in Hokkaido C^{3}I Bases', map on back cover. See also Jeffrey T. Richelson, *Foreign Intelligence Organizations*, (Ballinger, Cambridge, Massachusetts, 1988), p. 257.

[13] Desmond Ball and Richard Tanter, 'The Transformation of the JASDF's Intelligence and Surveillance Capabilities for Air and Missile Defence', *Security Challenges*, (Vol. 8, No. 3), Spring 2012, pp. 24-30.

the large Wakkanai station, but is the primary organisation at Maruyama and Rebun Island; No. 302 has its own station near Shibetsu (Kawakita), but is a tenant at the JASDF's SIGINT station at Nemuro. Other JGSDF Coastal Surveillance Units maintain SIGINT facilities on Tsushima Island, while a new unit was set up at Izumo in Shimane Prefecture in March 2008, facing the southwestern part of the Sea of Japan. In addition to maintaining a network of about 15 ELINT stations concerned with ocean surveillance, the JMSDF has units at most of the large DIH/JGSDF stations.[14] At Wakkanai, for example, the JMSDF unit is simply called 'JMSDF Wakkanai Base Detachment Unit'. The JASDF's Air Intelligence Collection Unit No. 1 is a tenant unit at Wakkanai; Unit No. 2 has its own facility on the northeast side of Nemuro township; and No. 3 is the primary unit at the Okushiri station. JASDF Air Intelligence Collection Units maintain the new SIGINT stations at Seburi-yama, Fukue-jima and Miyako-jima.

Some of the stations are very large, involving Circularly-disposed Antenna Arrays (CDAAs) known as 'elephant cages', and maintained by more than a hundred personnel, such as those at Chitose, Miho and Kikai-jima. The JASDF's new J/FLR-4 and J/FLR-4A stations at Seburi-yama, Fukue-jima and Miyako-jima are also quite large, involving a huge operations building and two large towers holding extensive antenna suites. The JASDF's Air Intelligence Collection Units are typically comprised of about 80-100 personnel.

The JASDF's J/FLR-2, J/FLR-3, J/FLR-4 and J/FLR-4A systems comprise a suite of antenna elements for intercepting VHF, UHF and SHF signals. These systems have been built by Toshiba since the late 1980s, beginning with the J/FLR-2 at Nemuro, and are technically and operationally direct descendants of the US AN/FLR-12 system at Wakkanai, bequeathed to Japan in 1972.

On the other hand, several stations are small and physically unimpressive, such as the No. 302 Coastal Surveillance Unit's facility at Rausu. Numerous different types of antenna systems are employed at the various stations. In addition to the large elephant-cage CDAAs, there are many smaller CDAAs, various sorts of Adcock direction-finding (DF) arrays, rhombic arrays, log-

[14] Desmond Ball and Richard Tanter, *The Tools of Owatatsumi: Japan's Ocean Surveillance and Coastal Defence Capabilities*, (Australian National University Press, Canberra, 2015), chapter 9.

periodic antennas, satellite communications antennas, and assorted VHF, UHF and SHF systems for ELINT collection.

Seven of the major DIH/JGSDF stations have HF DF systems. The huge 'elephant cages' at Miho, Chitose and Kikai-jima are the most sensitive. They can intercept HF signals out to a range of about 5,000 km or more, with a bearing accuracy of about one-half of a degree. A new 7-element system was installed at Wakkanai, Nemuro, Kobunato and Tachiarai in 2008-10. It consists of seven masts, about 13 metres high, deployed in a circle with a radius of 40 metres, a circumference of about 351.33 metres and a distance between each mast of about 36 metres (Plate 1). At Wakkanai, Nemuro and Kobunato, these replaced 36-element CDAAs, with two concentric circular arrays of 18 masts covering the lower and higher parts of the HF band, which had been built in 1988, 1991-92 and 1988 respectively (Plates 2a, b, and c). At Tachiarai, the new 7-element system replaced an old 8-element HF DF array. Similar systems had previously been at Miho, Kobunato and Kikai-jima, but were dismantled when their larger CDAAs became operational. Another 8-element HF DF array was at Ooi.[15] (Plate 3)

Many stations also have VHF and UHF DF systems for determining the location of line-of-sight VHF and UHF emitters. In northern Hokkaido, for example, there are VHF and UHF DF systems at the JGSDF SIGINT stations at Wakkanai, Rebun Island, Maruyama, Rausu, Nemuro (2) and Higashi Nemuro (Plate 4).

In addition to monitoring line-of-sight VHF communications, Japan is favourably placed for interception of VHF signals from thousands of kilometers away to the southwest due to an anomalously high electron density in the Sporadic E layer (Es) of the ionosphere over the East China Sea. It has been shown, for example, that VHF broadcast transmissions from China in the 39.75 to 72.25 MHz range are clearly receivable in Japan using both Yagi and log-periodic

[15] Hideharu Torii, 'Japan's Secret SIGINT Organizations: Focusing on North Korea', *Popular Communications*, March 2007, p. 10.

dipole arrays.[16] Indeed, VHF signals transmitted in Southeast Asia, including from Malaysia and the Philippines, can also propagate to Japan via the Es layer.[17]

Many of the stations are located at sites used for SIGINT operations before or during the Second World War, and which had been proven to be especially lucrative. For example, the sites at Wakkanai/Noshyappu (野寒布岬)[18] and Nemuro were in December 1944 two of the Japanese Navy's largest SIGINT stations, with the former covering the area around the northern part of the Sea of Japan and the southern part of the Sea of Okhotsk, and the Nemuro station covering a broad swath of the northern Pacific Ocean.[19] The Imperial Navy also maintained a large SIGINT station for intercepting Soviet communications at Shibata, not far from the present station at Kobunato.[20] Other sites were selected by the US in the 1950s and 1960s for intercepting signals in the Soviet Union, such as at Chitose, where the US station was transferred to Japan in 1971.

There have been few major changes at any of the stations targeted on Russia since the early 1990s. On the other hand, the capabilities of those stations primarily engaged in intercepting North Korean and Chinese signals have been substantially enhanced since the late 1990s, and especially since the early 2000s. The Miho station had reportedly established an ancillary COMINT facility at nearby Takao-yama by 1998, giving it better access to North Korean VHF signals. Ten radomes with satellite communications antennas have been installed at Tachiarai since 2002, and the new CDAA was opened at Kikai-jima in 2006. The three new JASDF J/FLR-4 and J/FLR-4A stations are directed primarily against

---

[16] Masahiro Yoneji, Toshiaki Takano, Hiroyuki Nakata and Shin Shimakura, 'Observation of VHF Broadcast Radio Waves Propagating from China', *Proceedings of Asia-Pacific Microwave Conference 2006*, at http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=04429784.

[17] Takano Toshiaki and Ujigawa Satoshi, 'Propagation Anomaly of Overseas TV Broadcasting Radio Waves and its Model of Mechanism', *Papers of Technical Meeting on Electromagnetic Compatibility, IEE Japan*, (Vol. EMC-03, No. 25-30), 2003, pp. 29-34, at http://sciencelinks.jp/j-east/article/200402/000020040204A0013243.php; and H. Nakata, Y. Akaike, Y. Otsuka, T. Takano, S. Ujigawa and I. Nagashima, 'Ray-tracing Calculation of VHF Radio Waves Scattered by Field-aligned Irregularities Associated with Equatorial Plasma Bubbles', *Transactions of the Institute of Electrical Engineers of Japan*, (Vol. 124, No. 12), 2004, pp. 1253-1254, at http://sciencelinks.jp/j-east/article/200402/000020040204A0013243.php.

[18] There are two capes in northern Hokkaido with names easily confused, especially in English. Cape Noshyappu (野寒布岬, sometimes rendered as Noshappu) is close to Wakkanai in northwest Hokkaido. Cape Nosappu (納沙布岬) is close to Nemuro in northeast Hokkaido.

[19] *Operational History of Japanese Naval Communications, December 1941-August 1945*, (Aegean Park Press, Laguna Hills, California, 1985), pp. 9, 22-24.

[20] *Ibid.*

Chinese signals. The two latest stations, currently under construction at Yonaguni and Iwoto, will both also be concerned primarily with Chinese signals.

The KAL 007 shoot-down: 'the target is destroyed'

The fullest public glimpse of the activities and capabilities of Japan's SIGINT stations was in September 1983, when Wakkanai became famous around the world as the station that had monitored the Soviet Air Force's communications during the shoot-down of the Korean Air Lines KAL-007 Boeing 747 airliner over Sakhalin on the evening of 31 August, Greenwich Mean Time (or the morning of 1 September, Tokyo time, nine hours ahead of GMT). On 5 September, reportedly with Tokyo's approval, President Reagan, in a special address to the nation, played a portion of a tape recording of the air-to-ground communications of the Soviet fighter pilots involved in the shoot-down. On 6 September, the US Ambassador to the United Nations, Jeane Kirkpatrick, played eleven minutes of air-to-ground recordings, and tabled a complete transcription of these tapes. However, neither the US nor Japan ever released any ground-to-air transcripts. These are more difficult for ground stations to intercept, and neither was willing to reveal any such capabilities. Indeed, the official position in both Washington and Tokyo has been, with some injudicious exceptions, that neither the US nor Japan intercepted any relevant ground-to-air communications.

The following is the actual shoot-down transmissions from Major Gennadie Osipovich, the pilot of the Sukhoi-15 (call-sign 805), as intercepted by the Wakkanai station, combined with the commands from Lieutenant Colonel Titovnin, the Flight Controller at the Soviet Combat Control Centre at Smirnykh Air Force Base in central Sakhalin, released by the Russian Federation to the UN's International Civil Aviation Organization (ICAO) in 1993:

Osipovich: (18:22:02 GMT) The target is decreasing speed.

Osipovich: (18:22:17) I am going around it. I'm already moving in front of the target.

Titovnin: Increase speed, 805.

Osipovich: (18:22:23) I have increased speed.

Titovnin: Has the target increased speed, yes?

Osipovich: (18:22:29) No, it is decreasing speed.

Titovnin: 805, open fire on target.

Osipovich: (18:22:42) It should have been earlier. How can I chase it? I'm already abeam of the target.

Titovnin: Roger, if possible, take up a position for attack.

Osipovich: (18:22:55) Now I have to fall back a bit from the target.

Gen. Kornukov: Oh, [obscenities] how long does it take him to get into attack position, he is already getting out into neutral waters. Engage afterburner immediately. Bring in the MiG-23 as well... While you are wasting time it will fly right out.

Titovnin: 805, try to destroy the target with cannons.

Osipovich: (18:22:37) I am dropping back. Now I will try a rocket.

Titovnin: Roger.

MiG-23 (163): (18:23:49) Twelve kilometers to the target. I see both [the Su-15 piloted by Osipovich and KAL 007].

Titovnin: 805, approach target and destroy target.

Osipovich: (18:24:22) Roger, I am in lock-on.

Titovnin: 805, are you closing on the target?

Osipovich: (18:25:11) I am closing on the target, am in lock-on. Distance to target is eight kilometers.

Titovnin: Afterburner.

Titovnin: AFTERBURNER, 805!

Osipovich: (18:25:16) I have already switched it on.

Titovnin: Launch!

Osipovich: (18:26:20) I have executed the launch.

Osipovich: (18:26:22) The target is destroyed.

Titovnin: Break off attack to the right, heading 360.

Osipovich: (18:26:27) I am breaking off attack.[21]

It is an extraordinary 4-minute glimpse of the activities of the Wakkanai station, still Japan's most famous SIGINT station, and still indispensible for monitoring communications in the Russian Far East.

[21] United States Information Service (USIS), 'Revised Transcript of Soviet Ground Control/Pilot Radio Transmissions', *Backgrounder*, 12 September 1983.

Plate 1

JGSDF 7-element CDAA systems,

Wakkanai, Nemuro, Kobunato, Tachiarai, installed in 2008-2010

Plate 2 (a)

Schematic of 36-element CDAA installed at Kobunato, 1988

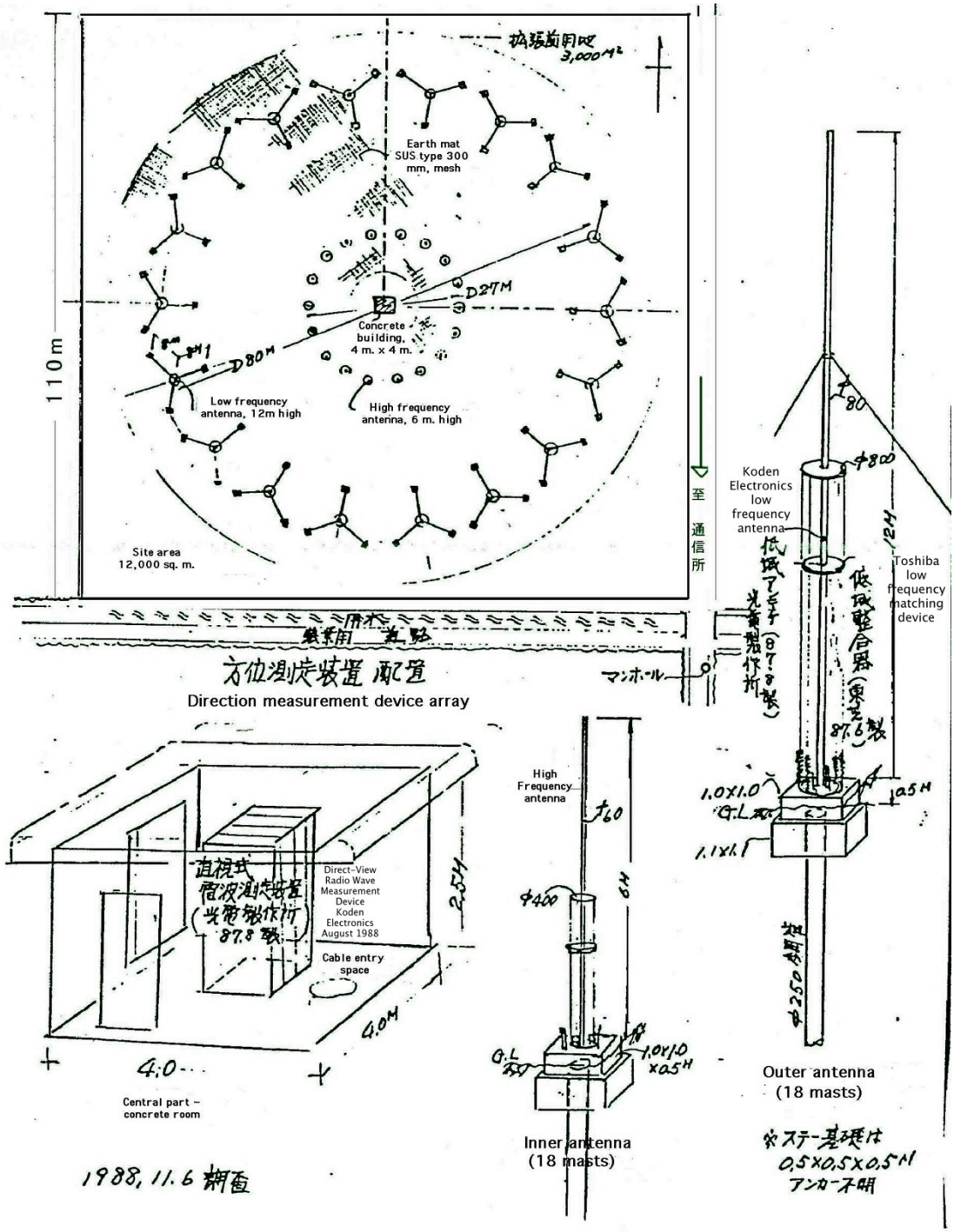


Plate 2 (b)

JGSDF 36-element CDAA, Higashi Nemuro, 21 September 2005

Plate 2 (c)

Section of the 36-element CDAA, Kobunato, 10 September 2005

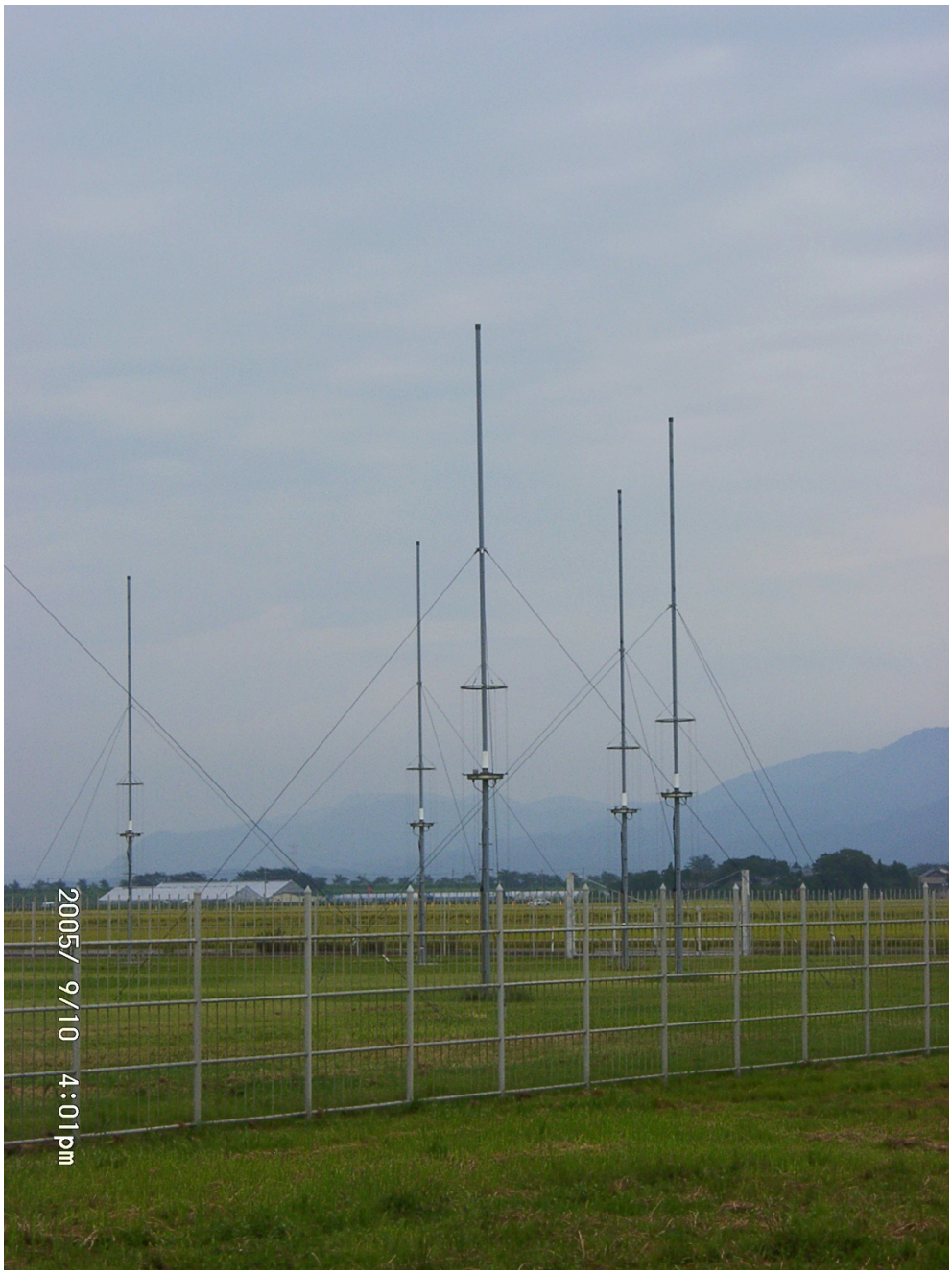


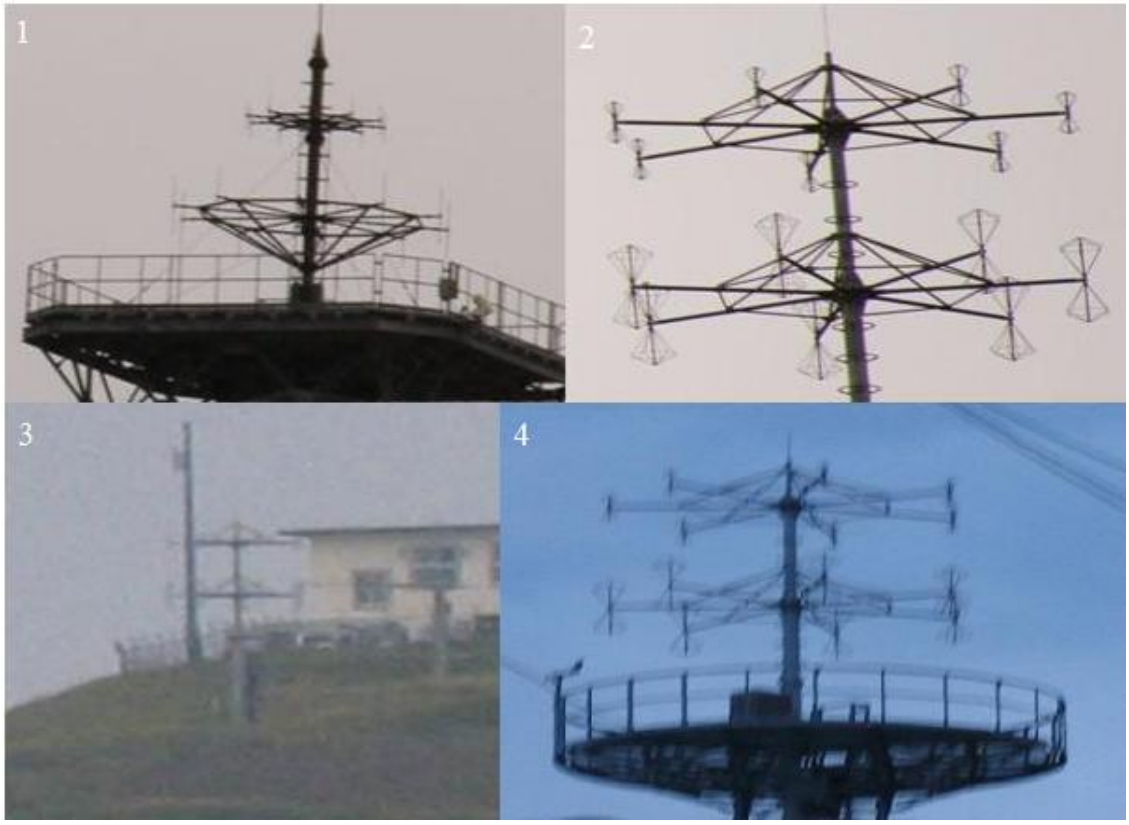
Plate 3

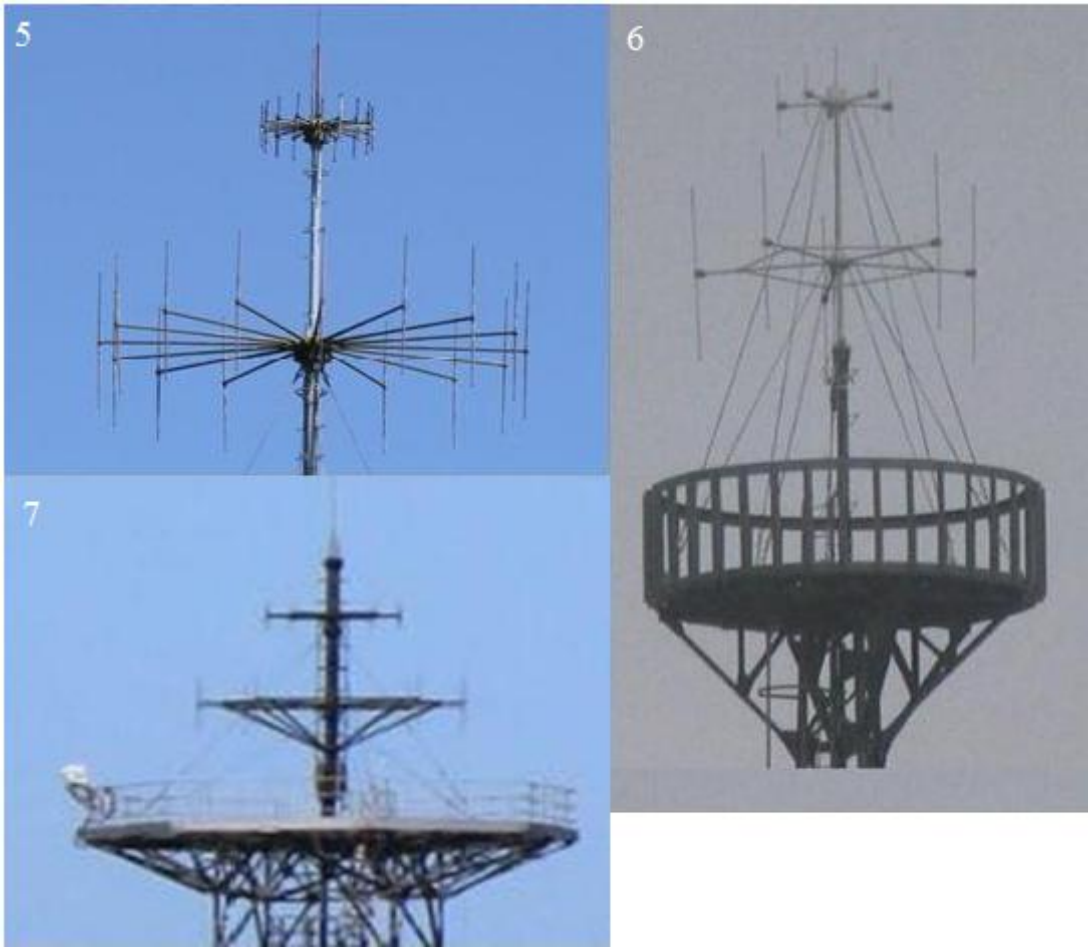
JGSDF 8-element HF DF systems

(Kobunato, 1991; 2. Ooi; 3. Tachiarai, July 2003; 4. Kikai-jima, February 2001)

Plate 4

JGSDF VHF/UHF DF antenna systems in northern Hokkaido, 2014





1. Wakkanai (8+8 elements), September 2011
2. Maruyama (7+7 elements), September 2011
3. Rebun Island (7+7 elements), September 2005
4. Rausu (7+7 elements), September 2005
5. Higashi Nemuro (16+16 elements), September 2011
6. Nemuro (5+5 elements), September 2005
7. Nemuro (8+8 elements), September 2011

Chapter 2

Wakkanai

Wakkanai (45° 25′ N, 141° 40′ E) is the northern-most town in Hokkaido. It is on a wind-swept peninsula, which is covered in wild-flowers in summer, and which abounds in monuments and antenna fields. On a clear day, it is possible to see Sakhalin from an observation tower in the town. (One of the most discernible sights is a large white radome at the southern tip of the island). Because of the KAL-007 affair, Wakkanai is the best known Japanese SIGINT site. In fact, while several different agencies maintain SIGINT facilities in the Wakkanai area, there are larger and more capable SIGINT stations elsewhere in Japan. Many of the antenna systems in the area are not concerned with SIGINT operations. The JASDF has a JADGE station overlooking the SIGINT station, on what the Americans used to call Hill 3, which has a large radome containing an early-warning radar, a small radome containing a satellite communication terminal, four large parabolic VHF troposcatter antennas, and two sets of VHF/UHF aeronautical-band antennas, as well as microwave dishes and HF antennas. Plate 5 shows the sign at the main entrance to the SIGINT station.

Wakkanai had been a site for Japanese Navy SIGINT operations from 1937 to 1945, when a detachment from the SIGINT station at Ominato maintained more than 20 LF and HF receivers, including five DF sets, in the Wakkanai-Noshyappu area.[22]

The USAF Security Service established a SIGINT station at Wakkanai in August 1951, where the Navy and the Army soon also set up facilities. The USAFSS unit was initially designated and organised as Detachment 12 of the 1st Radio Squadron Mobile (RSM) at Misawa, but for most of its subsequent history it was officially designated the 6986th Security Group. The site was controlled by the USAFSS under an Integrated Command Agreement between the US Service

[22] *Operational History of Japanese Naval Communications, December 1941-August 1945*, (Aegean Park Press, Laguna Hills, California, 1985), pp. 9-10, 22-24.

SIGINT agencies of 1 July 1959.[23] From the late 1950s until 1 July 1964, the 6986th Security Group maintained a detachment at Makubetsu, near Obihiri, in the southern part of Hokkaido.[24] The US Navy's Naval Security Group (NSG) maintained a detachment at Wakkanai which reported to the NSG base at Kamiseya, and which provided direct SIGINT support to US Navy warships operating in the northwest Pacific.

The JGSDF's Intelligence Division established a SIGINT station at Wakkanai, adjacent to the US complex, in 1955.[25] A photograph of the new 'Wakkanai Radio Observation Station' was published by *Mainichi Shimbun* in November 1955.[26] It became the JGSDF's No. 301 Coastal Surveillance Unit, officially formed in 1968. The JASDF had also established a SIGINT station at Wakkanai by the late 1950s. According to a USAFSS officer who served at Wakkanai in 1963-65, there was only very limited cooperation between the US and JASDF operations. He recalls working with Japanese counterparts 'on reporting Soviet submarines when they passed the Soya Strait'; allowing 'our [USAFSS] repair technicians to go up to the Japanese intercept operations and fixing their equipment in emergencies'; and exchanging 'some information one night [in December 1963] when the Russians desperately tried to shoot down one of our RB-47s in an ELINT ferret mission in the Sea of Okhotsk'.[27]

According to the report by the *Asahi* newspaper published in 1978, the signals received at the Japanese station at Wakkanai were recorded on tape and sent to Tokyo, where the communications intercepts were translated by Russian

---

[23] Josh Chapman, *A Special Historical Study of the Organizational Development of the United States Air Force Security Service, 1948-1966*, (Headquarters United States Air Force Security Service, San Antonio, Texas, 1 February 1967), p. 42.
[24] James E. Pierson, *A Historical Study of the Organizational Development of United States Air Force Security Service, 1970-1974*, (United States Air Force Security Service, San Antonio, Texas, 15 September 1974), p. 49.
[25] 『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 C^3I 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. 5.
[26] 「北海道・稚内電波観測所 、1955 年 10 月 撮影」、 *Mainichi Photo Bank*, ['Wakkanai, Hokkaido radio observation station, photo taken November 1955'], *Mainichi Photo Bank*, at http://photobank.mainichi.co.jp/dpscripts/DPDetail.dll?Detail.
[27] Bill Person, 'War Stories: Wakkanai', at http://members.xoom.com/XMCM/youngsr/6920th/warstories.htm.

linguists, while the intercepts of electronic emissions were analysed by electronics experts.[28]

The US station was officially deactivated on 30 June 1972.[29] Some of the sensitive electronic equipment was packed up and sent to Misawa, such as the Precision Measurement Equipment Laboratory (PMEL), but most of the buildings and antenna systems were taken over by the Japanese, including the main operations building on what US personnel called Hill 1, the area closest to Cape Noshyappu, and the IT&T AN/FLR-12 VHF/UHF SIGINT system, built in 1965-66, including the NSA's 'Arctic tower', which was still there in 1993.[30] (Plates 6 and 7)

In July 1973, the Japanese Government requested that the US supply it with YIG [Yttrium-Iron-Garnet] crystal tuning filters, produced by Watkins Johnson International, to replace those in the AN/FLR-12 system at Wakkanai. On 7 August, the Pentagon informed the State Department that when the Wakkanai station was transferred to Japan in 1972, 'the [FLR-12] equipment at Wakkanai was surplus to all U.S. requirements', but that 'because of its classified nature, it could not be sold as surplus property', and that 'since the Japanese Government indicated an interest in using the equipment, it was economically desirable to abandon it in place… for such use as the GOJ [Government of Japan] wished to make of it'.[31] However, in August 1974, the State Department informed the Embassy in Tokyo that although 'the Air Force no longer uses the FLR-12 system in which the filters are installed,… we have made this equipment available to other countries [including West Germany] and believe that we

[28] 『新情報戦』、朝日新聞社 (編集)、1978 年 8 月発行, [Asahi Newspaper Company, *Neo-Information War*, (Asahi, Tokyo, 1978)], p. 49.
[29] Pierson, *A Historical Study*, p. 49.
[30] James Hamilton, 'Arctic Tower at Former Wakkanai Air Station', July 1988, at http://www.wakkanaiwasmyhome.citymax.com/albums/album_image/2863222/837532.htm; 「稚内軍事基地」、佐藤佑二（著）、平和会レポート、1988 年 8 月 30 日, [Sato Yuji, in 'Wakkanai Military Base', [Report of Visiting Peace Group, 30 August 1988]; 「稚内情報基地調査報告」、佐藤佑二（著）、1988 年 11 月 28 日 [Sato Yuji, 'Survey Report on Wakkanai Intelligence Base', 28-29 October 1988]; and Matsui, 'Looking at New Developments', pp. 6-9.
[31] Cable from the Secretary of State, Washington, D.C., to the US Embassy, Tokyo, 'Transfer of Equipment at Wakkanai Air Station', 14 August 1973, *Public Library of U.S. Diplomacy, Wikileaks*, at https://wikileaks.org/plusd/cables/1973STATE160470_b.html; cable from US Embassy, Tokyo, to the Secretary of State, Washington, D.C., 'Transfer of Equipment at Wakkanai Air Station', 16 August 1973, *Public Library of U.S. Diplomacy, Wikileaks*, at https://wikileaks.org/plusd/cables/1973TOKYO10499_b.html.

should not compromise the data on frequency ranges' covered by the YIG filters. Approval was only given to Watkins Johnson to sell the filters to Japan when the JDA advised the US Embassy that 'no test data or specifications are required' and that it did not anticipate any problem replacing the inherited filters with the new ones.[32]

Arrangements were evidently made soon after for US units to operate their own facilities within the growing Japanese complex. A USAFSS officer who had earlier worked at Wakkanai returned to the station with a couple of colleagues for 'two months in 1978 on temporary duty…, supporting a special project'. He noted that 'the old facilities were still there', including the AN/FLR-12 system. They 'lived in the old PMEL building'. He has recounted that: 'Our mission was to test some equipment for certain collected signals, and to test the ears [antennas]. I was there to monitor air traffic as best I could'.[33] According to Seymour Hersh, the National Security Agency (NSA) organised a 30-person tri-service unit at Wakkanai, called Project CLEF, in 1982, which 'was stationed side-by-side with the Japanese, but operating entirely on its own'.[34] And according to a US Army Security Agency (ASA) official history for 1986, the ASA's Field Station at Misawa had four 'racks' at Wakkanai, which were being consolidated into two, and which were operated by a single operator (and which were often unstaffed).[35] A US defence contractor who spent six weeks at Wakkanai in August-September 1988 has said that 'all information we got was remoted back to Misawa'.[36] Hokkaido peace researchers who closely monitored the station in

[32] Cable from the Secretary of State, Washington, D.C., to the US Embassy, Tokyo, 'Munitions Control: Sale of Equipment to JDA', 5 August 1974, *Public Library of U.S. Diplomacy, Wikileaks*, at http://www.wikileaks.org/plusd/cables/1974STATE169900_b.html; cable from US Embassy, Tokyo, to the Secretary of State, Washington, D.C., 'Munitions Control: Sale of Equipment to JDA', 9 August 1974, *Public Library of U.S. Diplomacy, Wikileaks*, at https://wikileaks.org/plusd/cables/1974TOKYO10382_b.html;
[33] Larry Tart, *Freedom Through Vigilance: History of U.S. Air Force Security Service (USAFSS). Volume III: USAFSS Ground Sites in Alaska and the Far East*, (Infinity Publishing, West Conshohocken, Pennsylvania, November 2010), pp. 1309-1310.
[34] Seymour Hersh, *The Target Is Destroyed: What Really Happened to Flight 007 and What America Knew About It*, (New York: Random House. 1986), pp. 57-58.
[35] United States Army Security Agency*, United States Army Field Station Misawa Historical Report Fiscal Year 1986,* p. 110.
[36] Tart, *Freedom Through Vigilance*, p. 1310.

the late 1980s and early 1990s continued to refer to a US presence in materials (including sketches and diagrams) prepared in 1992-93.[37]

SIGINT operations at Wakkanai are conducted by several Japanese organisations, including the DIH and the JGSDF's 2nd Defence Intelligence Division Detachment, a JMSDF Detachment, the JASDF's No. 1 Air Intelligence Collection Unit, and the JGSDF's No. 301 Coastal Surveillance Unit. The 2nd Defence Intelligence Division Detachment is operationally subordinate to the DIH/JGSDF SIGINT station at Chitose. The JGSDF base at Nayoro, about 130 km southeast of Wakkanai, provides administrative and logistic support to the Wakkanai station as well as the associated units at Maruyama and Rebun Island. The JASDF's No. 1 Air Intelligence Collection Unit, which had 80 personnel at Wakkanai in 1988, maintains ELINT antennas at the site that the Americans called Hill 2, between Hills 1 and 3, as well the modified AN/FLR-12 system, with its 'Arctic tower', on Hill 1. The JGSDF's No. 301 Communications Unit had 40 personnel at the Wakkanai station in 1988.[38] It had 'about 100' in July 2010.[39]

The best view of the Wakkanai site, including the SIGINT facility, is from the waterfront at Cape Noshyappu, where tourists have their photographs taken with either Sakhalin Island or the fields of strange domes and large parabolic dishes in the background. There are many photographs of the site on the Web, taken by both Japanese and foreign tourists. They show a complex of towers and radomes in the forefront, on the edge of a plain just above the Cape, and the JASDF's JADGE antennas on the hills behind. (Plate 8)

The main SIGINT area at Hill 1 is shaped like an isosceles triangle, pointing out over Cape Noshyappu towards Sakhalin Island, with the Operations Building near the middle of the antenna complex. (Plate 9) According to Japanese peace researchers, the main operations rooms are located about 90 feet below Hill 1. Notes in June 1992 showed the lay-out of the underground centre, with the JGSDF, JASDF and US rooms identified.[40] There is a tunnel leading into the

[37] Note on Wakkanai, 30 June 1992, in files provided by Owen Wilkes; and Matsui, 'Looking at New Developments', pp. 6-9.
[38] Sato, 'Wakkanai Military Base'.
[39] Beefed-up Okinawa Border Eyed', *Japan Times*, 20 July 2010, at http://www.japantimes.co.jp/text/nn20100720a5.html.
[40] Note on Wakkanai, 30 June 1992, in files provided by Owen Wilkes.

eastern side of the hill from behind Wakkanai's built-up area on the flat-land below the hill.

Next to the Operations Building is a 12-storey, 48-metre high circular tower, a core component of the modified AN/FLR-12 system. Radomes line the northwestern and northeastern sides of the triangle, with several thinner steel towers holding a variety of HF, VHF and UHF antennas in the open area behind them. There are more than 30 antenna systems at the site, including six radomes, VHF/UHF DF systems, and more than about 20 log-periodic antennas of various sorts, as well as the modified AN/FLR-12 system.

The modified AN/FLR-12 panoramic data collection system comprises several sub-systems covering the VHF, UHF and SHF frequency bands. (Plate 10) These are mounted on three main structures, as well as in several radomes. The first is the tall tower next to the Operations Building, the top two storeys of which are enclosed in a protective cover, with a small box on the top. The diameter of the bottom tier is about 12.75 metres and that of the top tier is about 11 metres; the room at the top is about two metres square and about a metre high. The second structure, shorter and squatter than the tall tower and located near the northern-most point of the complex, is a circular two-tier 'wedding cake', with the base section about 17.5 metres in diameter, the upper tier about 10 metres in diameter, and with a cylindrical dome about four metres high on the top. Third, behind the 'wedding cake' there is a tall cement tower, perhaps 15 metres high, with a large crossed VHF LPA and a HF/VHF whip antenna on the top.

The modified AN/FLR-12 system includes six circular radomes, which are visible from the waterfront. High-resolution GoogleEarth imagery dated 24 July 2007 allows accurate measurement of their dimensions. There are two 13.5-metre diameter domes on the northwestern side, a 4.5-metre diameter dome closer to the central tower, and two 13.5-metre diameter and one 10-metre diameter radomes on the northeastern side.

The MoD regularly issues contracts for support of the AN/FLR-12 system, usually concerning repairs and maintenance, but sometimes also for new equipment. For example, contracts for the AN/FLR-12 system were issued on 14

April 2011, 23 April 2012, 17 May 2012 and 25 July 2012. These were all listed as 'Fukasouchi [付加装置]' contracts, being for 'additional devices'.[41]

In September 2011, there were three tall steel towers behind the radome complex, best viewed from around the southeastern side. One of these held a new UHF/VHF DF system, with separate 8-element UHF and 8-element VHF antennas (Plate 11); this system had replaced a long-standing 16+16-elements system some time after 2005 (Plate 12). In 2011, there were eight VHF/UHF LPAs attached to the side of this tower, which had not been there in 2005. (Plate 13) The other two towers hold different sorts of VHF antennas. They each have four poles in a square and a fifth pole in the middle, which are probably used for VHF DF. One of them has two new VHF/UHF LPAs attached to the side; these had not been there in 2005. There was a HF doublet strung between the two most southeasterly towers, as in 2005.

There have been many changes since the JGSDF inherited the station in 1972. Wakkanai was frequently visited by Japanese peace researchers in the late 1980s and the early 1990s, who meticulously documented and photographed the antenna systems. In 1988, for example, the present 12-storey tower and the 'wedding cake' were not yet built. On the other hand, there were two other large towers. One of these was about 10 storeys high, with the upper two or three storeys enclosed like a large elevated plastic tank or drum. (Plate 14) It was located on the eastern side of the complex, and was evidently one of the original AN/FLR-12 elements installed by IT&T in 1965-1966, although a small radome which had previously been situated on the top had been removed. The second tower, referred to as the 'Arctic Tower' by its former American users and as the 'US/NSA Birdcage' by peace researchers in the late 1980s, was slightly taller. It had replaced the other original AN/FLR-12 tower, and had no covering over its five extant antennas. There were two vertical VHF/UHF LPAs, one horizontal

[41] See, for example, 「公示第 50 号, 平成 24 年 4 月 23 日. 変更公示、分任支出負担行為担当官、航空自衛隊第３補給処長」防衛書, ('Public Notice No. 50, 23 April 2012. Notice of changes. Responsible officer: Head, Third Supply Depot, ASDF', Ministry of Defense), at http://www.mod.go.jp/asdf/3dep/koubooyobikikakukyousou/kouji_pdf/240423 kouji50.pdf; and「公示第 56 号, 平成 24 年 5 月 17 日. 変更公示. 分 任支出負担行為担当官、航空自衛隊第３補給処長」防衛書, ('Public Notice No. 56, 17 May 2012. Notice of changes. Responsible officer: Head, Third Supply Depot, ASDF', Ministry of Defense), items 6648-6652, at http://www.mod.go.jp/asdf/3dep/koubooyobikikakukyousou/ kouji_pdf/240517kouji56.pdf.

VHF/UHF LPA, and two VHF/UHF LPAs with reflectors.[42] There was also a pair of long, high-magnification binoculars focused on Sakhalin Island. As the former USAFSS officer who returned to Wakkanai in 1978 noted: 'The old FLR-12s were still there – with the huge binoculars still attached, so you could see the SAM site across the strait on Sakhalin'.[43]

The present tall FLR tower was constructed in 1991. A sequence of photographs taken that year show the progress of the construction, including work-men installing antennas and the protective covering at the top in the final stages.[44] (Plate 15) It was also reported in 1991 that some of the antenna systems atop the uncovered 'American tower' had been removed.[45] Photographs taken in 1993 show three large towers – the present FLR tower, the remaining original AN/FLR-12 tower and the 'Arctic tower' bereft of antennas -- but it is likely that the latter two were dismantled soon after. The FLR 'wedding cake' and cement tower were not there in 1993. However, there was another, two-tiered structure in 1988 and 1993; it was located near the northern-most point of the complex, was about 15 metres high, and held a semi-spherical dome 2-metres in diameter on top and a cylindrical or thimble-shaped dome about two metres high on the second tier, and was probably removed when the 'wedding cake' was installed. There were seven or eight radomes at the site in August 1988, including three large ones and at least four small ones.[46] An official aerial photograph taken on 22 September 1999 shows five large radomes, one slightly smaller than the other four.

In October 1988, there was a 16-element UHF and 16-element VHF Doppler DF system mounted atop one of the steel towers. It was still there in September 2005, but had been replaced by the new 8-element UHF and VHF DF system by 2011. There was also in 1988 a tall mast with a UHF log-periodic DF antenna and four box antennas (Plate 16); it was not there in September 2005.

---

[42] Sato, 'Wakkanai Military Base'; and Sato, 'Survey Report on Wakkanai Intelligence Base'.
[43] Tart, *Freedom Through Vigilance*, pp. 1309-1310.
[44] 『安保、自衛隊そして憲法と北海道』、日本平和大会北海道実行委員会, [The Alliance, the SDF, the Constitution and Hokkaido, Hokkaido Action Committee, Japan Peace Conference, October 1991], p. 14; and Matsui, 'Looking at New Developments', p. 8.
[45] The Alliance, the SDF, the Constitution and Hokkaido, p. 14.
[46] Sato, 'Wakkanai Military Base'; and Matsui, 'Looking at New Developments', pp. 6-9.

In September 2005, there had been three other tall steel towers holding various sorts of VHF antennas. On the tops of two of them were five masts, four of which held VHF LPAs on one tower and three of which held vertical VHF LPAs on the other. One of these had been dismantled by September 2011, while the VHF LPAs had been removed from the other one. The third tower had four poles in a square and a fifth pole in the middle, as it did in September 2011.

In addition, the JGSDF's No. 301 Coastal Surveillance Unit at Wakkanai maintains one of the new 7-element HF DF systems. For two decades, the Unit had a 36-element HF Doppler CDAA, with two concentric circular arrays each with 18 masts for covering both the high (10 – 30 MHz) and low (around 1.5 – 10 MHz) parts of the HF spectrum, which it used for HF radio interception and HF DF purposes. (Plate 17) It was described by peace researchers in October 1988, soon after its installation, and was situated about 800 metres south of the Hill 1 complex.[47] CDAAs of this sort typically have a DF accuracy of 1-2 degrees. The 36-element system is clearly shown in high-resolution GoogleEarth imagery dated 24 July 2007, and seems to still be there in poorer imagery dated 7 April 2009. However, construction of the new 7-element system at the site is shown in imagery dated 6 October 2009, and it is emplaced in imagery dated 16 August 2010. (Plate 18)

Wakkanai and the shoot-down of KAL 007

Wakkanai's role in tracking KAL 007 and intercepting Soviet communications concerning the shoot-down was known around the world within a few days of the tragedy. News reports, and subsequent journalistic investigation, graphically exposed Wakkanai's technical abilities, operating modalities and reporting processes, as well as important aspects of the US-Japan intelligence connection. Photographs of the station were published in *Newsweek* and *U.S. News & World Report*.[48]

In 1983, as Seymour Hersh has noted, the Japanese SIGINT facility at Wakkanai 'was what American intelligence officers despairingly called a nine-to-five operation, an essentially daytime operation whose recording systems were

[47] Sato, 'Survey Report on Wakkanai Intelligence Base'.
[48] 'How the U.S. Listened In', *Newsweek*, 12 September 1983, p. 25; and Orr Kelly, 'The Big Ears of Uncle Sam', *U.S. News & World Report*, 12 September 1983, p. 24.

voice-activated at all other times'.[49] During the evening and overnight shifts the facility was staffed by only a 'skeleton crew'; the night-time intercepts were normally not processed until the morning shift of analysts came on duty at 7 a.m., when they prepared an initial evaluation before passing the recorded material to the Chobetsu in Tokyo and to the large US SIGINT complex at Misawa, which coordinated many of the US SIGINT activities in the North Pacific and performed 'second echelon' processing of material intercepted at other stations. According to Hersh, 'if alerted in advance or during a crisis, the Japanese officer on duty can monitor the automatically recorded material, evaluate its significance, and report on it to his superiors before moving it along to Misawa', but there had been no alert on the night of 31 August/1 September, and no-one at the Japanese station had listened to the shoot-down.[50] It was not until nearly 0500 Tokyo time (2000 GMT), after Tokyo Air Traffic Control had informed the JDA that the KAL airliner was missing, and an hour and a half after the shoot-down, that the Wakkanai station reported the content of its over-night intercepts to the JDA HQ in Tokyo.[51]

On the other hand, in the USAF Project CLEF rooms, five operators were assigned 'to monitor the equipment during the mid-watch shift'. One of them happened to be listening to Soviet Air Force channels and 'heard it all'; recording the pilot chatter, he thought they were probably engaged in some exercise, until he heard an Su-15 pilot shout that he had launched a missile. The group played the tape recording 'over and over' before writing a 'gist', or summary transcript. However, the CLEF unit had 'no way of immediately relaying its intercepted communications' to Misawa. One of the CLEF operators called the watch officer at Misawa on an open and unsecured telephone line to report the incident. The NSA and US Air Force SIGINT authorities at Misawa decided not to wait until the JASDF analysts arrived for their morning shift to process their material, but to send an aircraft to Wakkanai to collect the CLEF tape recordings and 'preliminary transcript for further analysis by the language experts at Misawa'.[52]

[49] Hersh, *The Target Is Destroyed*, p. 57.
[50] *Ibid*, pp. 60, 64.
[51] David E. Pearson, *KAL 007: The Cover-Up*, (Summit Books, New York, 1987), p. 115.
[52] Hersh, *The Target Is Destroyed*, pp. 57-61.

The Misawa station had itself monitored many communications during the night concerning the shoot-down, although it was too far away to intercept the VHF air-to-ground or ground-to-air transmissions. At 0243 Tokyo time (1743 GMT), as KAL 007 was more than half-way across the Sea of Okhotsk, it intercepted a 'snap-on', a priority signal on a secure communications link from the Soviet radar site on Iturup Island in the Kurils to the military district in Khabarovsk, and the station was soon 'awash with enciphered messages and other evidence of unusual early-morning Soviet activity'.[53] At 0520 Tokyo time, Japanese liaison personnel at Misawa informed their US colleagues that Wakkanai's voice-activated system had recorded the Soviet activity over Sakhalin.[54] Further information was relayed to Misawa as the JASDF's analysts began their morning shift at Wakkanai around 0700.[55] A few minutes after 0800, the watch officer at Misawa sent an urgent CRITIC message (No. 1-83) to the National SIGINT Operations Center (NSOC) at the NSA HQ at Fort Meade reporting the disappearance of the airliner, the 'snap-ons', the higher alert status of Soviet forces, the report from the CLEF unit that an Su-15 had fired a missile, and the fact that both the JASDF and US units had recorded the events over Sakhalin.[56] The tape recording from CLEF arrived at Misawa at about 0830, where it took the linguists 'a good hour' to play the tapes and not only reconfirm that the Soviets had fired a missile, but also that the pilot had reported the target being 'destroyed'. A second CRITIC message (No. 2-83) was sent to Fort Meade with this information soon after 1000 Tokyo time.[57]

The JASDF's tapes from Wakkanai arrived at Misawa at around 1100 that morning, with transcripts translated from Russian into Japanese. A JASDF unit assigned to the Misawa station had to translate the transcripts into English. The JASDF's tape recorders were manufactured in Japan, and the recordings were of a better quality than those made by Project CLEF.[58] Early that afternoon a C-141 aircraft collected both the JASDF and CLEF tapes at Misawa and flew them to

[53] *Ibid*, p. 56.
[54] Pearson, *KAL 007,* p. 115.
[55] Hersh, *The Target Is Destroyed*, p.68.
[56] *Ibid*, p. 66.
[57] *Ibid*, pp. 68-69.
[58] *Ibid*, pp. 70, 72.

Fort Meade for 'further analysis'.[59] Copies of both were also sent to a special NSA unit in the US Embassy in Tokyo, which was asked to enhance the quality of the tapes as well as 'work on translation'.[60]

The JDA had also arranged that morning for copies of both the radar tapes recorded at the BADGE station and the intercepts recorded at the JASDF facility at Wakkanai to be sent to Tokyo. The head of the JDA, Tanikawa Kasuo, had been 'roused from his bed' soon after 0500, and had 'quickly assembled a working group'.[61] At around 0830, Tanikawa contacted the office of the Chief Cabinet Secretary Gotoda Masaharu, who was telephoned at home by his secretary and told that the airliner was missing and that considerable Soviet activity had been detected.[62] Gotoda was telephoned again around 1000, and told that intelligence from Wakkanai indicated that it was 'likely' that the airliner had been shot down by a Soviet fighter. Gotoda spent the next hour 'in contemplation'.[63] Shortly after 1100, the Vice Minister of Defense, Natsume Haruo, gave Gotoda his first detailed report on the incident, based on the radar data and intercepts recorded at Wakkanai. Two hours later, Gotoda took Vice Minister Natsume to give the first formal report to Prime Minister Nakasone, although both the JDA and Gotoda's office had been in contact with the Prime Minister's staff since about 0830 that morning.[64] After hours of cross-checking all of the Wakkanai evidence, the Government decided to call an emergency press conference that evening, at which Foreign Minister Abe Shintaro said that 'it appeared likely' that the Soviets had shot down the KAL airliner.[65] The existence of the tape recordings was reported in the Japanese media later that evening, and, as recounted above, President Reagan and Ambassador Kirkpatrick played critical sequences of the Su-15 pilot's air-to-ground communications, recorded at Wakkanai, on 5 and 6 September.

---

[59] *Ibid*, p. 72.
[60] *Ibid*, p. 146.
[61] Pearson, *KAL 007,* p. 125.
[62] Hersh, *The Target Is Destroyed*, p. 125.
[63] *Ibid*, pp. 140-141.
[64] *Ibid*, p. 141.
[65] Richard Rohmer, *Massacre 007: The Story of the Korean Air Lines Disaster*, (Coronet Books, Sevenoaks, Kent, 1984), p. 128.

Everyone now knew about the extraordinary ability of the Wakkanai station to intercept air-to-ground VHF/UHF aeronautical-band radio communications. However, there has been much dispute about whether it also intercepted ground-to-air VHF/UHF communications from command and control centres at Sakhalin and elsewhere in the Russian Far East to the Soviet pilots, a technically more problematic task. *Kyodo News* in Tokyo on 1 September published alleged intercepts of exchanges between the ground and the pilot which accord closely with parts of the sequence reproduced above, including the order from the ground to 'fire' and the pilot's shout that he had launched a missile.[66] Three such sets of two-way exchanges were reportedly recorded at Wakkanai.[67] On 2 September, the Japanese Broadcasting Corporation reported that 'tape recordings had been made of both sides of the conversation between Soviet ground stations and the interceptors they were controlling', and that the tapes 'covered the full two and a half hours during which the Korean aircraft was being tracked by Soviet radar'.[68]

On 6 September Chief Cabinet Secretary Gotoda declared at a press conference, in response to persistent questioning, that 'Japan has also monitored communications from the ground to the fighter but will not release it'. He said that the air-to-ground communications 'will be enough evidence to prove the Soviet shooting down of the South Korean jet'. However, the existence of such ground-to-air intercepts was promptly denied by Vice Minister of Defense Natsume.[69] Tokyo had acceded to Washington's 'request' to reveal Wakkanai's air-to-ground recordings, but it was clearly concerned about the implications. As

---

[66] 'Soviet Pilot's Conversation Reported', *Kyodo News*, 1 September 1983, in Foreign Broadcast Information Service (FBIS) Part IV: Asia, Pacific and East Asia, 2 September 1983. See also Robert D. McFadden, 'U.S. Says Soviet Shot Down Korean Airliner', *New York Times*, 2 September 1983, pp. A1, A4; Pearson, *KAL 007*, p. 167; R. W. Johnson, *Shootdown: The Verdict on KAL 007*, (Chatto & Windus, London, 1986), p. 169; Rohmer, *Massacre 007*, pp. 128-129; and Alexander Dallin, *Black Box: KAL 007 and the Superpowers*, (University of California Press, Berkeley, California, 1985), p. 110.

[67] 'Soviet Pilot's Conversation Reported', *Kyodo News*, p. 129.

[68] Rohmer, *Massacre 007*, p. 130; and Johnson, *Shootdown*, p. 169.

[69] 'SDF Monitored Ground-Air Communications', *Kyodo News*, 6 September 1983, in Foreign Broadcast Information Service (FBIS) Part IV: Asia, Pacific and East Asia, 6 September 1983; 'Radio Transcripts on Downed ROK Plane Released', 6 September 1983, in Foreign Broadcast Information Service (FBIS) Part IV: Asia, Pacific and East Asia, 7 September 1983; and 'More on Released Transcripts', *Kyodo News*, 7 September 1983, in Foreign Broadcast Information Service (FBIS) Part IV: Asia, Pacific and East Asia, 7 September 1983. See also Pearson, *KAL 007,* p. 168; and Alexander Dallin, *Black Box*, p. 110.

the chief Foreign Ministry spokesman, Miyake Wasuke, said on 8 September, referring only to the air-to-ground recordings: 'We are very worried for security reasons about the possible results of revealing these tapes'.[70] Nevertheless, on 9 September, the Japanese press reported 'unanimously' that Japan did have ground-to-air tapes.[71]

There were similar contradictions in Washington. President Reagan declared on 5 September that: 'We only have the voices of the pilots; the Soviet ground-to-air transmissions were not recorded'.[72] However, a 'senior administration official' told the *New York Times* on 6 September that tapes existed of a sufficient amount of 'ground chatter' for the US to know that the shoot-down had been ordered from the ground.[73] On 7 September, Larry Speakes, the White House spokesman, said that the US did have tapes of the Soviet ground controllers talking to their fighters, but that some of these were 'unintelligible.'[74] A few hours later, however, he denied his earlier statement and said that the US did not have any ground-to-air tapes – though he said that the Japanese had some such tapes, and 'it was up to them whether they were released or not'.[75]

Unnoticed in the press commentary at the time, the US had in fact already released an instance of ground-to-air communications. Included in Ambassador Kirkpatrick release to the UN on 6 September was a sequence of two-way exchanges between Soviet ground controllers at a base at Trikotazh on Sakhalin and a fighter pilot (call-sign 121), in which the pilot was asked if he could 'see the target'.[76]

In February 1985, a Socialist Diet member requested the Government to release the complete set of air-to-ground recordings. He was suspicious about gaps in the version released by Ambassador Kirkpatrick, and he wanted

---

[70] Rohmer, *Massacre 007*, p. 135.
[71] Johnson, *Shootdown*, p. 171.
[72] Lou Cannon, 'Reagan Announces Mild Sanctions on Soviets', *Washington Post*, 6 September 1983, p. A1; and Johnson, *Shootdown*, p. 170.
[73] Steven R. Weisman, 'U.S. Denies Having Ground-Station Tapes', *New York Times*, 8 September 1983, p. A12; and Johnson, *Shootdown*, p. 170.
[74] Weisman, 'U.S. Denies Having Soviet Ground-Station Tapes'; Johnson, *Shootdown*, p. 170; and Pearson, *KAL 007*, p. 170.
[75] Weisman, 'U.S. Denies Having Ground-Station Tapes'; and Johnson, *Shootdown*, p. 170.
[76] Pearson, *KAL 007,* p. 170.

independent translations. He also did not believe the official denials concerning the existence of ground-to-air tapes. However, a JDA official said that releasing the air-to-ground tapes would compromise Japan's intelligence collection capabilities. He also insisted that Japan had no recordings of ground-to-air transmissions.[77]

Twenty years after the KAL 007 tragedy, a US Air Force SIGINT officer who had been stationed at Wakkanai in 1963-65 published an account of his sojourn in which he highlighted the attempted shoot-down of a US RB-47 ELINT aircraft over the Sea of Okhotsk in December 1963. There were many intercepts of ground-to-ground communications, particularly involving orders to increase the alert status of air defence units in the area and to scramble fighter aircraft. But his recounting is also replete with details of communications from ground controllers and radar stations to fighters in the air, including transmissions from Smirnykh Air Force Base and other bases on Sakhalin that had figured in the 1983 incident, ordering the fighters 'to bracket the intruder and then close in for a close visual intercept', ordering the invading aircraft be destroyed, and, when the RB-47 had escaped, ordering the fighters to return to base.[78]

The Wakkanai station undoubtedly intercepted a large volume of Soviet communications concerning other aspects of the incident, apart from the communications between the fighter pilots and their ground control stations. For example, *Kyodo News* reported early on 2 September 1983 that the JSDF's interception stations 'also monitored orders to dispatch a total of eight Soviet vessels to waters where the KAL plane most likely crashed'. [79] The communications between Moscow on the one hand and the Soviet ground controllers and search units, as they sought to keep Moscow abreast of their activities, would have been very informative.

There is no doubt that the revelations concerning Wakkanai's role were costly in terms of Japan's ability to monitor Soviet military communications in succeeding years. On 9 September, a Foreign Ministry official said that Japan's collection capabilities had 'already been affected'. He said that after the air-to-

[77] *Ibid*, pp. 321-322, 348.
[78] Bill Person, *Critic Makers: The Ironworks Incident*, (Bill Person, 2003), pp. 237, 241, 243.
[79] 'Soviet Pilot's Conversation Reported', *Kyodo News*.

ground tapes were made public on 5 and 6 September, 'the Soviet Union promptly changed the codes and radio frequencies used by its aircraft in the Far East'. Taking no chances, the ground-to-air procedures were changed as well. One report said that, within a few days of the publicity, Japan could 'now monitor and understand only 60% of what it could before the airliner incident'. A Japanese intelligence official reportedly said that: 'Our peepholes have been closed in the last several days'. According to some estimates, 'Japan's intelligence-gathering might have been set back by as much as five years'.[80]

[80] William Chapman, 'Russians Said to Use New Codes', *Washington Post*, 8 September 1983, p. A23; and Sam Jameson, 'Disclosures on Soviet Pilots Costly to Japan's Security', *Los Angeles Times*, 19 September 1983, pp. 1, 15.

Plate 5

Sign at the main entrance to the JGSDF SIGINT station, Wakkanai, September 2011

Plate 6

US AN/FLR-12 SIGINT system, DIH SIGINT station, Wakkanai, October 1988

Plate 7

The US AN/FLR-12 'Arctic tower', DIH SIGINT station, Wakkanai, October 1988

Plate 8

DIH SIGINT station (with JASDF JADGE station on the hill behind), Wakkanai, 4 September 2011

Plate 9

DIH SIGINT station, Wakkanai, GoogleEarth imagery,

13 September 2012

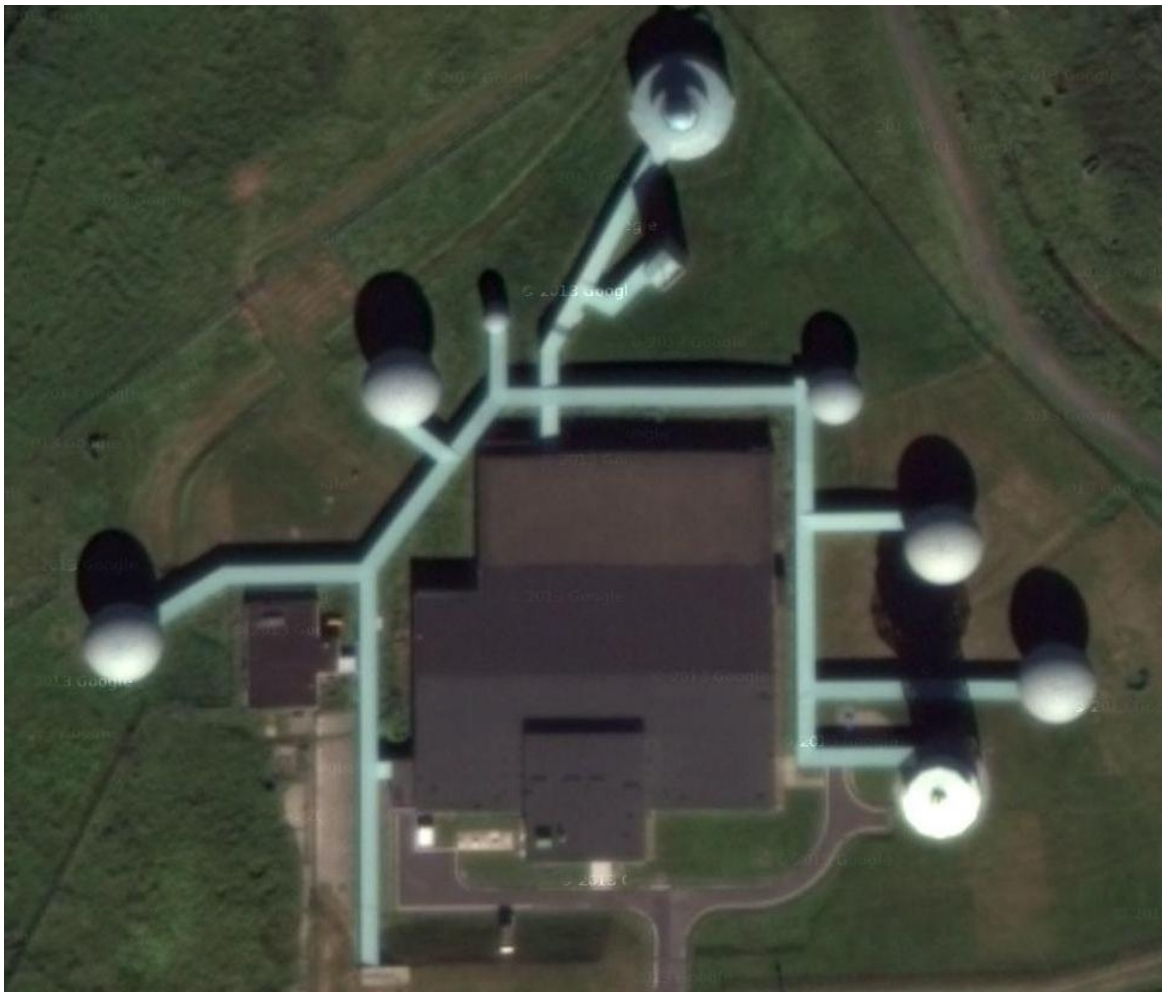


Plate 10

J/FLR system (modified AN/FLR-12),

DIH SIGINT station, Wakkanai,

6 September 2005

Plate 11

DIH SIGINT station, Wakkanai,

(with new 8+8 element VHF/UHF DF system atop tower on right-hand side),

4 September 2011

Plate 12

JGSDF 16+16 element VHF/UHF DF antenna system, Wakkanai, October 1988 and 5 September 2005. (Removed by 2011)

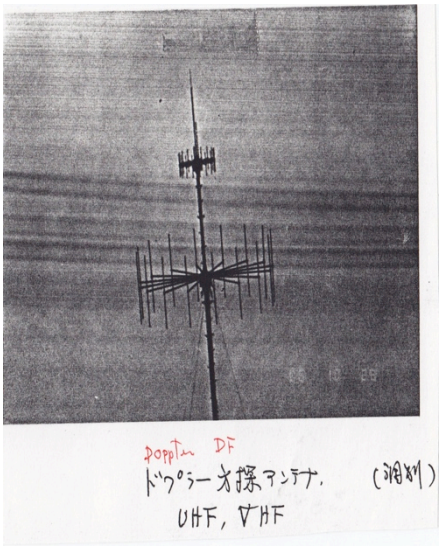


Plate 13

8-element vertical VHF/UHF LPA system, Wakkanai,

4 September 2011

Plate 14

AN/FLR-12 tower and the US 'Arctic tower', JGSDF SIGINT station, Wakkanai,

October 1988

Plate 15

J/FLR tower under construction and AN/FLR-12 tower,

JGSDF SIGINT station, Wakkanai, September 1991

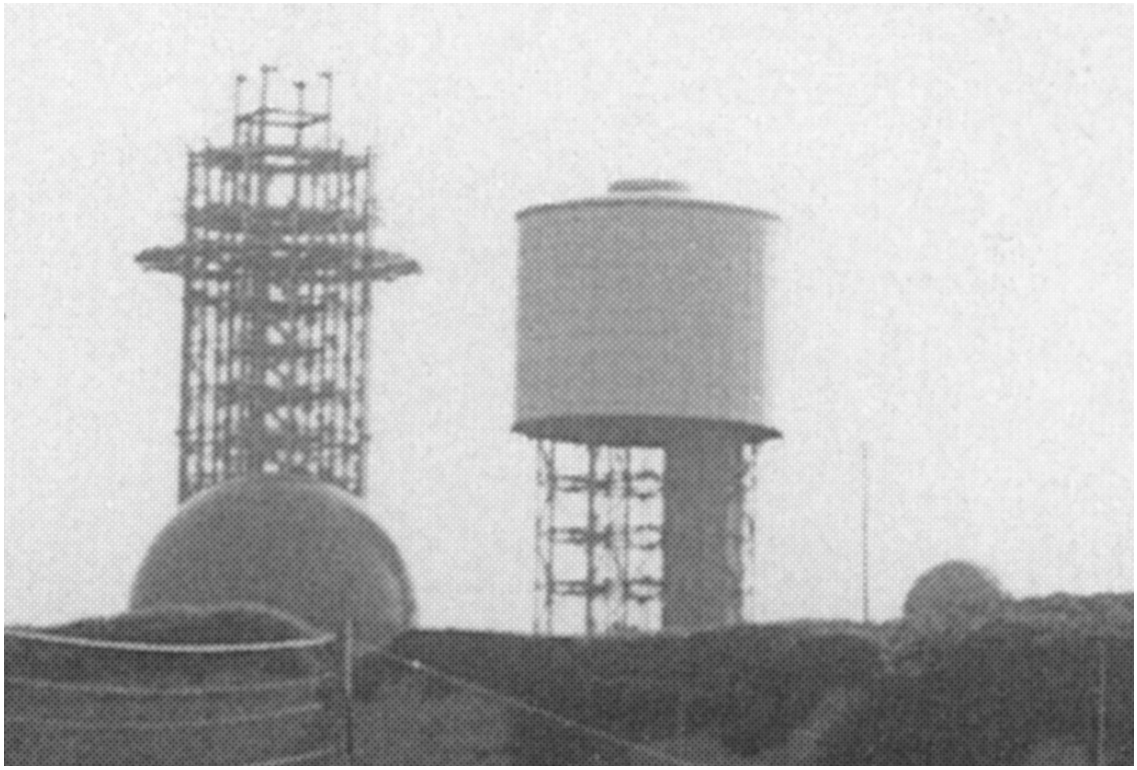


Plate 16

UHF log periodic DF blade antenna and box antennas,

Wakkanai, 1988. (Removed by 2005)

Plate 17

36-element CDAA, JGSDF Coastal Surveillance Unit 301,

Wakkanai, 6 September 2005

Plate 18

7-element CDAA, JGSDF Coastal Surveillance Unit 301, Wakkanai,

GoogleEarth imagery, 16 August 2010

Chapter 3

Rebun Island

Rebun Island is located about 60 km west of Wakkanai, astride the western approaches into the Soya Strait from the Sea of Japan. Arrow-shaped, the island h as many peaks and cliffs. The population is only about 3,200, most of who live in the port-town of Kafuka, on the southeast side, with the others in small remote fishing communities around the coastal fringes. Fairly bleak for most of the year, it is covered by amazing alpine wild-flowers in June-August, when thousands of Japanese tourists make day-trips by ferry from Wakkanai to view the floral extravaganza.

The Rebun Detachment of the Wakkanai station is situated near the northeastern tip of the island, at the base of Kaneda Promontory. A sign outside the base gives its coordinates as 45° 23′ N, 141° 02′ E and says it is 'The northernmost point of the JSDF'. The main unit stationed at the base is a detachment of the JGSDF's 301 Coastal Surveillance Unit, together with an element of its 301 Communications Company, but both JASDF and JMSDF personnel also work there. (Plate 19)

The Rebun Detachment of 301 Coastal Surveillance Unit was officially formed in 1979.[81] It was identified as a detachment of the 301st Unit at Wakkanai in a Japanese magazine published in May 1987;[82] it was mentioned by Jeffrey Richelson in his study published in 1988, based on information provided to him by Japanese peace researchers in the mid-1980s;[83] and it was described as a facility of the JGSDF's 301 Coastal Surveillance Unit in reports by Hokkaido peace groups in 1991 and 1993.[84]

---

[81] 「礼文分屯地, 分屯地の紹介」、『陸上自衛隊第２師団』、 陸上自衛隊, ['Rebun Sub-base, Introduction to Sub-bases', GSDF 2nd Division], at http://www.mod.go.jp/gsdf/nae/2d/unit/butai/bunton/bunton.html

[82] 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 http://www.dtic.mil/dtic/tr/fulltext/u2/a346884.pdf.

[83] See Jeffrey T. Richelson, *Foreign Intelligence Organizations*, (Ballinger, Cambridge, Massachusetts, 1988), p. 257.

[84] 『安保、自衛隊そして憲法と北海道』、日本平和大会北海道実行委員会, [*The Alliance, the SDF, the Constitution and Hokkaido*, Hokkaido Action Committee, Japan Peace Conference, October 1991], p. 14; and 『北海道の C3I 基地に見る新たな福強と変化』、松井愈（著者）、

The station consists of a two-storey operations building; a 5-metre diameter radome near the northwestern corner of the roof of the operations building; a large 3-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 VHF/UHF DF system with separate 7-element VHF and UHF DF arrays; and four tall masts holding HF wires, forming a large diamond around the operations area. (Plates 20 and 21) According to local residents, the present station was built around 1997-98; all of the construction materials, equipment and even the construction workers were brought from Honshu and Hokkaido.

It has also been the subject of spurious claims. For example, it was asserted in 1993 that the station at Rebun-to is one of the places used to intercept US communications going into and out of Japan.[85]

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 C^3I 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. 7.

[85] Peter Schweizer, *Friendly Spies: How America's Allies Are Using Economic Espionage to Steal Our Secrets,* (The Atlantic Monthly Press, New York, 1993), p. 83.

Plate 19

Signs at the entrance to the Rebun SIGINT site

(JGSDF Coastal Surveillance Unit 301),

Rebun Island

Plate 20

JGSDF Coastal Surveillance Unit 301, Rebun Island

Source: Ministry of Defense photograph

Plate 21

JGSDF Coastal Surveillance Unit 301, Rebun Island, 7 September 2005

Chapter 4

Maruyama, Cape Soya

The Wakkanai station also maintains a detachment at Maruyama ('round mountain'), a rounded hill 168 metres high about three kilometres south of the tip of Cape Soya, about 27 km to the northeast of the main Wakkanai site. Cape Soya is the northern-most point of Japan (45° 31′ N, 141° 56′ E), and the site of the Soya Peace Park, various interesting memorials (including one dedicated to the victims of KAL-007), and the remnants of an Observation Station built in 1904 to monitor Russian naval movements through the Soya Strait. The listening station is situated at the highest point on the Cape, in the middle of lush dairy cattle farms.

The Maruyama station was established on 1 November 1981.[86] It was reportedly maintained by 80 personnel from the JGSDF's 301 Coastal Surveillance Unit in August 1988.[87] Personnel from the JASDF's Air Information Collection Unit No. 1 at Wakkanai have also been noted at the facility.[88] As of October 1991, the US Air Force's ESC at Misawa reportedly also maintained a detachment at Maruyama.[89]

The operations building is a three-tiered concrete structure, with a 9-metre diameter radome atop the second tier and two 5-metre diameter radomes on the roof of the top tier. There are about nine horizontal and vertical VHF/UHF LPAs around the building, as well as a mast with two 7-element UHF and VHF Doppler DF arrays, identical to the system at Rebun Island, and a tower with a microwave dish pointing southwest to Wakkanai. Four of the horizontal VHF

---

86 「第 301 沿岸監視隊」、ウィキペディア, ['JGSDF 301st Coast Observation Unit', *Wikipedia - Japanese*], at http:// ja.wikipedia.org/wiki/第 301 沿岸監視隊.

87 「稚内軍事基地」、佐藤佑二（著）、平和会レポート、1988 年 8 月 30 日, [Sato Yuji, 'Wakkanai Military Base', Report of Visiting Peace Group, 30 August 1988].

88 『安保、自衛隊そして憲法と北海道』、日本平和大会北海道実行委員会 [*The Alliance, the SDF, the Constitution and Hokkaido,* Hokkaido Action Committee, Japan Peace Conference, October 1991], p. 14; and 『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 C^3I 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. 6-9.

89 *The Alliance, the SDF, the Constitution and Hokkaido*, p. 14.

LPAs are attached to a steel mast (identical to the VHF LPA system at Rebun), while another four, pointing northeast, are attached to the tower holding the microwave dish. There is also a 5-metre tower with a vertical VHF/UHF LPA on the roof. There are also two other masts on the eastern side which each hold large VHF antennas. (Plates 22 and 23) There is a small car park near the entrance on the northeastern side, with about six cars and room for only a few more.

Japanese peace researchers who visited the site in 1988 reported only three antenna systems, these being the UHF and VHF Doppler DF arrays and the VHF/UHF LPA on the roof the operations complex.[90] Photographs taken in 1991 show the 9-metre diameter radome on the second tier, and also a 4-metre diameter radome and a cylindrical radome on the roof of the third tier (Plates 24 and 25); the latter two were replaced by the two 5-metre diameter radomes by 2005. The two sets of four horizontal VHF LPAs had not yet been installed in 1991.[91]

[90] 「稚内情報基地調査報告」、佐藤佑二（著）、1988 年 11 月 28 日 [Sato Yuji, 'Survey Report on Wakkanai Intelligence Base', 28-29 October 1988].
[91] Matsui, 'Looking at New Developments', p. 6.

Plate 22

JGSDF Coastal Surveillance Unit 301, Maruyama,

4 September 2011

Plate 23

JGSDF Coastal Surveillance Unit 301, Maruyama,

4 September 2011

Plate 24

JGSDF Coastal Surveillance Unit 301, Maruyama, 1991

Plate 25

JGSDF Coastal Surveillance Unit 301, Maruyama, 1991

Chapter 5

Shibetsu, Kawakita and Rausu

Shibetsu was listed in the account of Japan's SIGINT stations published by Jeffrey Richelson in 1988, based on information provided to him by Japanese peace researchers in the mid-1980s.[92] The unit in charge was identified as the JGSDF's 302 Coastal Surveillance Unit by Hokkaido peace researchers in reports published in 1991 and 1993.[93] Shibetsu is about 23 km across the Nemuro Strait from Kunashiri, one of the islands of Japan's 'Northern Territories', occupied by the Soviet Union in 1945, at the southern end of the Kuril Islands chain. It is 52 km northwest of Nemuro, where the unit maintains important subsidiary facilities. The unit has 'around 80' personnel.[94]

Its HQ is situated in Shibetsu town, about 5-6 streets back from the shore-line. Organisationally, it is an 'operational unit' of the JGSDF's Kushiro Base, located about 100 km southwest of Shibetsu. The 302 Communications Company provides communications services for the unit.[95] A tower at the main office building on the northern side of the base, near the main entrance, holds four microwave dishes, two of which point to the west and two to the south. (Plate 26) There is a helicopter landing pad on the western side of this building.

---

[92] Jeffrey T. Richelson, *Foreign Intelligence Organizations*, (Ballinger, Cambridge, Massachusetts, 1988), p. 257.

[93] 『安保、自衛隊そして憲法と北海道』、日本平和大会北海道実行委員会, [*The Alliance, the SDF, the Constitution and Hokkaido, Hokkaido Action Committee*, Japan Peace Conference, October 1991], p. 14; and 『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 C^3I 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.

[94] James Simpson, 'As Plans for Coastal Monitoring Unit Proceed, Yonaguni Residents Raise Voices', *Japan Security Watch*, 22 August 2011, at http://jsw.newpacificinstitute.org/?p=7801#comments.

[95] 地理院地図（電子国土 Web) [Geographical Survey Institute, (Electronic National Territory Web)], at http://watchizu.gsi.go.jp/watchizu.aspx?id=65453150&slidex=0&slidey=800; and 「標津分屯地」、ウィキペディア、[JGSDF Vice-Camp Shibetsu, Wikipedia - Japanese] , at http://ja.wikipedia.org/wiki/標津分屯地.

The operations base is located at Kawakita, on a mountain ridge 19 km west of Shibetsu.[96] 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-coloured one mounted above the first one, with a diameter of about 6 metres, and three large cylindrical thimbles with diameters of about five 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. (Plate 27)

The Shibetsu station maintains a detachment at Rausu, a small fishing town, situated about half way up the eastern side of the Shiretoko Peninsula, in the Shiretoko National Park, a pristine wilderness area inhabited by one of the largest remaining communities of brown bears in the country. It is about 55 km by road from Shibetsu. The JGSDF station is nestled in a niche on the steep hill-side above the town, about 50 metres beyond the Rausu Kunashiri Observation Tower (羅臼国後展望塔), the public look-out which provides a commanding view of the middle part of Kunashiri Island, just 25 km across the Nemuro Strait. A sign at the locked gate identifies it as the 'Defense Agency Kushiro Base Operation Unit'.

Inside the security compound is a 3-storey building, about 10 metres high, with a 6-metre diameter radome on the roof, connected by an enclosed passage-way to a two-floor administration and operations building. Behind these buildings is a tower with a single microwave dish pointing to Shibetsu on the side and 7-element UHF and VHF Doppler DF systems, identical to the sets at Rebun Island and Maruyama, on the top. About 20 metres away is another steel tower with three vertical VHF antennas and four HF whip antennas. (Plate 28) The station is minimally-staffed. The car park, which is shared by personnel at the station and the staff and visitors to the public observatory, can only hold about 20 cars.

---

[96] 「川北通信所、『北方最前線！！　謎のレーダーサイト！？』」、千島の桜 ～ Hokkaido Nakashibetsu ～　[*Kawakita Communications Station, 'Frontline Hokkaido!! Radar site mystery!?', Cherry Blossoms of Chishima - Nakashibetsu Hokkkaido*], at http://blogs.yahoo.co.jp/panzer_tiger222/archive/2009/10/3?m=lc.

Plate 26

JGSDF Coastal Surveillance Unit 302, Shibetsu,

7 September 2011

Plate 27

JGSDF Coastal Surveillance Unit 302, Kawakita, Shibetsu,

7 September 2011

Plate 28

Detachment of the JGSDF's Coastal Surveillance Unit 302,

Rausu, Hokkaido,

10 September 2005

Chapter 6

Nemuro and Higashi Nemuro

Nemuro is a fishing and farming area with a large JSDF presence. The town is about 20 km from Cape Nossapu (納沙布岬), Japan's most northeastern point, jutting into the north Pacific; it is directly south of the Habomai group of disputed islets, part of the 'Northern Territories' occupied by the Soviet Union and now Russia since 1945. The cape is about seven km south of Suisho Island, the closest of several rocky outcrops that comprise part of the Habomai group, and about 30 km across the Nemuro Strait from the southeast side of Kunashiri. (A Russian 'observation post' and radar facility on Suisho Island is visible from Nossapu).[97] The JASDF has a JADGE station, with a single J/FPS-2 radome, maintained by the 26th Air Control and Warning Squadron, situated on the eastern side of the town, close to the Pacific coast.

Nemuro was also used by the Imperial Japanese Navy as a SIGINT site during the Second World War. Like Wakkanai, it served as an intercept and DF station subordinate to the Ominato Communications Unit. It was equipped in December 1944 with six DF systems and ten other HF receivers.[98] In the 1950s, a USAFSS detachment from Misawa was stationed at Nemuro, intercepting Soviet Air Force signals.[99]

The DIH/JGSDF and the JASDF maintain separate SIGINT stations in the Nemuro area, both of which were cited in the *Asahi* report published in 1978.[100] The DIH/JGSDF station is located at Katsuragi in Higashi Nemuro; called the JGSDF Communications Centre, it is maintained by a Detachment of the Chitose

---

[97] Hiroyasu Yamazaki, 'Couple Work to Make Russian Seamen Feel at Home', *The Japan Times*, 3 December 2002, at http://search.japantimes.co.jp/cgi-bin/nn20021203b5.html; and 'Habomai Islet Gets Russian Orthodox Church', *Orthodox News*, 18 November 2005, at http://old.orthodoxnews.org/198/Habomai.htm.

[98] *Operational History of Japanese Naval Communications, December 1941-August 1945*, pp. 9, 22-24.

[99] Richard R. Ferry, *A Special Historical Study of the Organizational Development of United States Air Force Security Service, 1948-1962*, (Headquarters United States Air Force Security Service, Kelly Air Force Base, San Antonio, Texas, 15 February 1963), pp. 52, 58.

[100] 『新情報戦』、朝日新聞社 (編集)、1978 年 8 月発行, [Asahi Newspaper Company, *Neo-Information War*, (Asahi, Tokyo, 1978)], pp. 47, 49.

DIH/JGSDF SIGINT unit. It is a relatively small compound, perhaps 100 metres square, situated about 300 metres southwest of the JASDF JADGE base, with the Nemuro railway line near its western boundary.

There were about a dozen antennas at the DIH/JGSDF station in 2011. A tall steel tower next to the operations building, on the eastern side of the compound, has a UHF/VHF Doppler DF system, with separate 16-element UHF and VHF DF antennas, on the top. Mounted near the top are also one vertical VHF LPA and two horizontal VHF LPAs. (Plates 29 and 30) Two tall steel towers and another two tall steel poles support HF wires. Four masts on the northern side support a variety of HF systems. (Plate 31)

There have been several changes since Hokkaido peace researchers detailed the antenna systems at the station in 1988. At that time there were a UHF discone antenna and a crossed VHF/UHF LPA, as well as a VHF LPA, attached to the tower holding the UHF/VHF DF system; the discone and crossed LPA were still there in 1993, but have since been removed.[101] In 2005, there was a very tall steel tower in the southeast corner of the compound, which had four horizontal VHF LPAs and a HF mast on the top. However, it had been removed by 2011.

The JASDF's SIGINT station is visually much more impressive, with a spectacular cluster of radomes. It is maintained by the JASDF's Air Information Collection Unit No. 2, and is situated on the northeast side of Nemuro township, about 2.5 km northeast of the JGSDF/DIH Higashi Nemuro station, on the way to Cape Nosappu. The station is surrounded by dairies and hay farms. The clearest view of the radomes at the main complex is from Sudou Farm on the northeast side, but more leisurely vistas of the whole site are available from the Meiji Peace Park on the southwest side of the site.

---

[101]「情報収集基地について」、佐藤裕二（著）、『'88 年日本平和大会：第 6 分科会「なくそう！核戦争用 C³I」資料』1988 年 11 月 19 日 [Sato Yuji, 'Intelligence Collection Bases in Japan', Materials for Section 6, 'Close C^{3}I for Nuclear Use', Japan Peace Committee Conference, 19 November 1988]; and『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 C^{3}I 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. 10-12.

The JASDF's ELINT complex consists of a compound with operations, administration and maintenance buildings; the J/FLR-2 panoramic VHF/UHF/SHF SIGINT suite comprised of six radomes and a large cylindrical thimble housing ELINT and COMINT systems, and mounted on three separate tiered structures with internal stairwells and corridors to each system (Plates 32, 33 and 34); and a tall steel tower on the northwestern side of the radome complex. The tower has a VHF pole and two vertical VHF LPAs on the top, another vertical VHF LPA lower down the side of the tower, and three 'box'-type UHF antenna systems down one side. (Plates 35 and 36) There are also a HF pole and a VHF LPA on top of the northern-most radome structure.

The antenna systems have remained virtually unchanged since 1992. Photographs of the facility taken by Japanese peace researchers in the late 1980s and early 1990s show that four of the radomes and the cylindrical thimble, as well as the tall tower, were there in 1989. Three of the radomes, each about 6.8 metres in diameter, and the thimble, about 2.8 metres high and 2.5 metres in diameter, are mounted on the largest and southern-most of the three tiered structures; the other radome that was there in 1989 is mounted on the northern-most structure, and is about 6.5 metres in diameter. (Plate 37) Photographs taken in August 1991 show construction of another tiered structure between the other two; the fifth and sixth radomes were installed on this in 1992, one about 4.2 metres in diameter and one about nine metres in diameter.[102] (Plate 38)

Contracts are regularly awarded by the JASDF to Toshiba for repair and maintenance of the J/FLR-2 system at Nemuro. For example, Toshiba received a contract for 14,542,500 yen in June 2005 for 'regular repair' of the J/FLR-2 system.[103] In May 2006, Toshiba was awarded another contract for 16,905,000 yen for 'regular repair' of the J/FLR-2 system.[104] In August 2006, it received a contract for 3,731,700 yen for 'regular repair' of the J/FLR-2 'ground radio-wave

---

[102] 『安保、自衛隊そして憲法と北海道』、日本平和大会北海道実行委員会 (*The Alliance, the SDF, the Constitution and Hokkaido*, Hokkaido Action Committee, Japan Peace Conference, October 1991), p. 14; and Matsui Masaru, 'Looking at New Developments', pp. 10-12.

[103] 随意契約一覧表、平成 17 年 6 月、航空自衛隊第 3 補給処, ['Table of Contracts, June 2005', JASDF 3rd Supply Depot, Sayama, Saitama-ken], at http://www.mod.go.jp/asdf/3depotprocure/sonota/zuikei/riyuu/1706.pdf.

[104] 随意契約一覧表、平成 18 年 5 月、航空自衛隊第 3 補給処、埼玉県狭山市, ['Table of Contracts, May 2006', JASDF 3rd Supply Depot, Sayama, Saitama-ken], at http://www.mod.go.jp/asdf/3dep/sonota/zuikei/riyuu/1805.pdf.

measurement system'.[105] In May 2007, it received another contract for 15,516,900 yen for 'regular repair' of the J/FLR-2 system.[106] In February 2007, Toshiba also received a contract for 56,364,000 yen to provide 12 alternating-current motors, described as 'components of the J/FLR-2 radio-wave jamming system'.[107]

On 14 March 2011, the Ministry of Defense, on behalf of the JASDF, announced contract notices for several J/FLR-2 components, including a Bearing Indicator, indicating that the J/FLR-2 system also has a DF capability.[108] On 17 May 2012, the Ministry released a "Notice of Changes' in which it noted that a Bearing Azimuth Indicator was required as a *Fukasouchi* or 'additional device', also evincing a DF capability.[109]

The JGSDF's 302nd Coastal Surveillance Unit also has two facilities at the JASDF's ELINT station at Nemuro. First, it has a small compound about 100 metres northwest of main JASDF complex. (Plate 39) It was established in 1993, and now consists of a 12-metre radome on a 7-metre high concrete building and four tall steel towers near the radome. (Plates 40 and 41) Two of these were installed in 1993. One is located on the northwest side of the compound, and has a small platform on top holding a VHF pole as well as both vertical and horizontal VHF LPAs.[110] The second is located about mid-way between the JASDF compound and the JGSDF tenant unit. On top this tower is a VHF/UHF DF system, with separate 5-element VHF and 5-element UHF arrays.

---

[105] 随意契約一覧表、平成１８年８月、航空自衛隊第３補給処、埼玉県狭山市, ['Table of Contracts, August 2006', JASDF 3rd Supply Depot, Sayama, Saitama-ken], at http://www.mod.go.jp/asdf/3dep/koukyou/zuikei1812.pdf.

[106] 随意契約一覧表、平成１９年５月、航空自衛隊第３補給処、埼玉県狭山市, ['Table of Contracts, May 2007', JASDF 3rd Supply Depot, Sayama, Saitama-ken], at http://www.mod.go.jp/asdf/3dep/koukyou/zuikei1905.pdf.

[107]契約に係る情報の公表、平成１９年２月、航空自衛隊第３補給処、埼玉県狭山市, ['Information Disclosure on Contracts (Acquisitions, etc), February 2007', JASDF 3rd Supply Depot, Sayama, Saitama-ken], at http://www.mod.go.jp/asdf/3dep/koukyou/zuikei1902.pdf.

[108] 公示第 49 号, 平成 23 年 3 月 14 日, 変更公示, 分任支出負担行為担当官, 航空自衛隊第 3 補給処長, 小嶋 信義, [Notice of change, Public Notice No. 49, 14 March 2011, Officer responsible: Kojima Nobuyoshi, Head, JASDF 3rd Supply Depot], item 4077, at http://www.mod.go.jp/asdf/3dep/koubooyobikikakukyousou/kouji_pdf/230314kouji49.pdf.

[109]公示第 56 号, 平成 24 年 5 月 17 日. 変更公示. 分 任支出負担行為担当官、航空自衛隊第 3 補給処長」防衛書, ['Public Notice No. 56, 17 May 2012. Notice of changes. Responsible officer: Head, Third Supply Depot, ASDF', Ministry of Defence], item 6699, at http://www.mod.go.jp/asdf/3dep/koubooyobikikakukyousou/kouji_pdf/240517kouji56.pdf.

[110] Matsui, 'Looking at New Developments', p. 11.

The third and fourth towers were not there in Terraserver imagery dated 2 November 2007, but they are clearly shown on Terraserver imagery dated 4 March 2010 and GoogleEarth imagery dated 3 September 2010. One of the new ones is on the southwest side of the compound, and holds an 8-element VHF and 8-element UHF DF system; it is identical to the VHF/UHF DF system installed at Wakkanai between 2005 and 2011. It also has two sets of eight vertical VHF/UHF LPAs on the upper half of the tower, identical to the set at Wakkanai. The fourth tower is located on the eastern side of the JGSDF's compound and holds additional VHF LPA systems. The layout is superbly rendered in GoogleEarth imagery of the area dated 29 April 2012 and a GoogleEarth Street view dated June 2014 (Plate 42).

Second, 302 Coastal Surveillance Unit established a large 36-element CDAA HF DF system at Higashi Nemuro in 1991-92. It was located on the southeast outskirts of the town, near the coast (43.308528°, 145.600522°), about 500 metres south of the main DIH/JGSDF SIGINT site. Like the system installed at Wakkanai a few years previously, the CDAA had an outer circle of 18 taller poles monitoring the lower part of the HF band and an inner ring of 18 shorter poles monitoring the higher part.[111]

The 36-element CDAA at Higashi Nemuro was dismantled in September 2011. (Eight of the HF elements had been removed as of 7 September). (Plate 43) A new 7-element antenna array, identical to the ones at Wakkanai, Kobunato and Tachiarai, is shown in high-resolution GoogleEarth imagery of the JASDF SIGINT base dated 3 September 2010. (It was not there in imagery dated 4 March 2010). It is located about 700 metres northwest of the main JASDF complex (43.341843°,

145.610275°). (Plate 44)

Plate 29

16-element UHF and VHF Doppler DF systems, JGSDF SIGINT station, Higashi Nemuro, 1989

[111] *Ibid*, p. 12.

Plate 30

16-element UHF and VHF Doppler DF systems and VHF LPAs,

DIH/JGSDF SIGINT station, Higashi Nemuro,

7 September 2011

Plate 31

HF antennas, DIH/JGSDF SIGINT station, Higashi Nemuro,

7 September 2011

Plate 32

J/FLR-2 system, JASDF SIGINT station, Nemuro,

from the north side,

9 September 2005

Plate 33

J/FLR-2 system, JASDF SIGINT station,

from the southeast side,

Nemuro,

9 September 2005

Plate 34

J/FLR-2 system, JASDF SIGINT station,

from the east side, Nemuro,

9 September 2005

Plate 35

Antenna towers at JASDF and JGSDF ELINT sites,

Nemuro, 1993

Plate 36

VHF antennas on the SIGINT tower

in the JASDF compound,

Nemuro,

10 September 2005

Plate 37

J/FLR-2 system,

JASDF SIGINT station, Nemuro, 1989

Plate 38

New J/FLR-2 radomes

at JASDF SIGINT station,

Nemuro, 1993

Plate 39

JGSDF and JASDF compounds, Nemuro,

GoogleEarth imagery,

3 September 2010

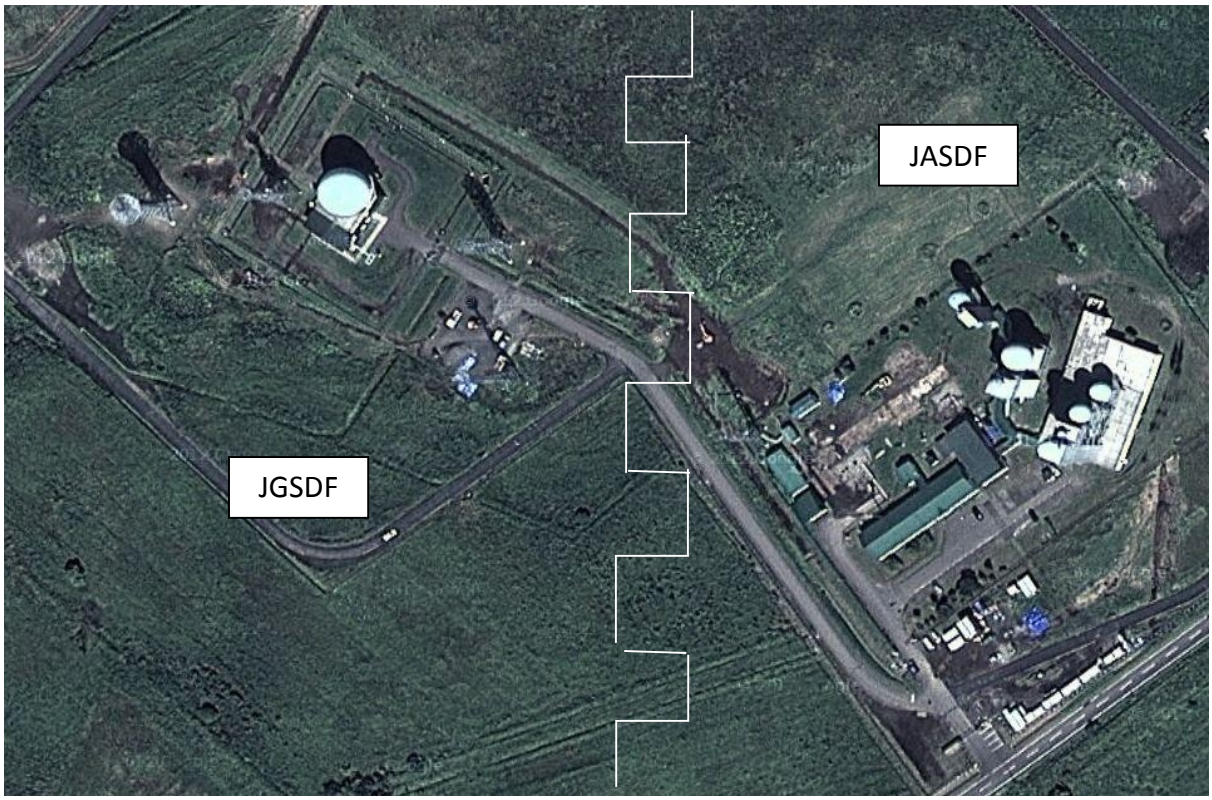


Plate 40

JGSDF Coastal Surveillance Unit 302 radome (12-metre diameter)

and VHF antenna tower

at JASDF SIGINT site, Nemuro,

7 September 2011

Plate 41

JGSDF Coastal Surveillance Unit 302 radome and four antenna towers,

at JASDF SIGINT site, Nemuro,

7 September 2011

Plate 42

JGSDF Coastal Surveillance Unit 302 compound

(with radome and four antenna towers,

and JASDF SIGINT tower on the right),

at JASDF SIGINT site, Nemuro,

GoogleEarth Street view image, June 2014

Source: GoogleEarth, at
https://www.google.com.au/maps/@43.336182,145.61536,3a,21.3y,326.26h,93.87t/data=!3m4!1e1!3m2!1sLkQ-2ag-nHT7Sd2UUBKayw!2e0

Plate 43

36-element CDAA (with 8 poles removed), Higashi Nemuro,

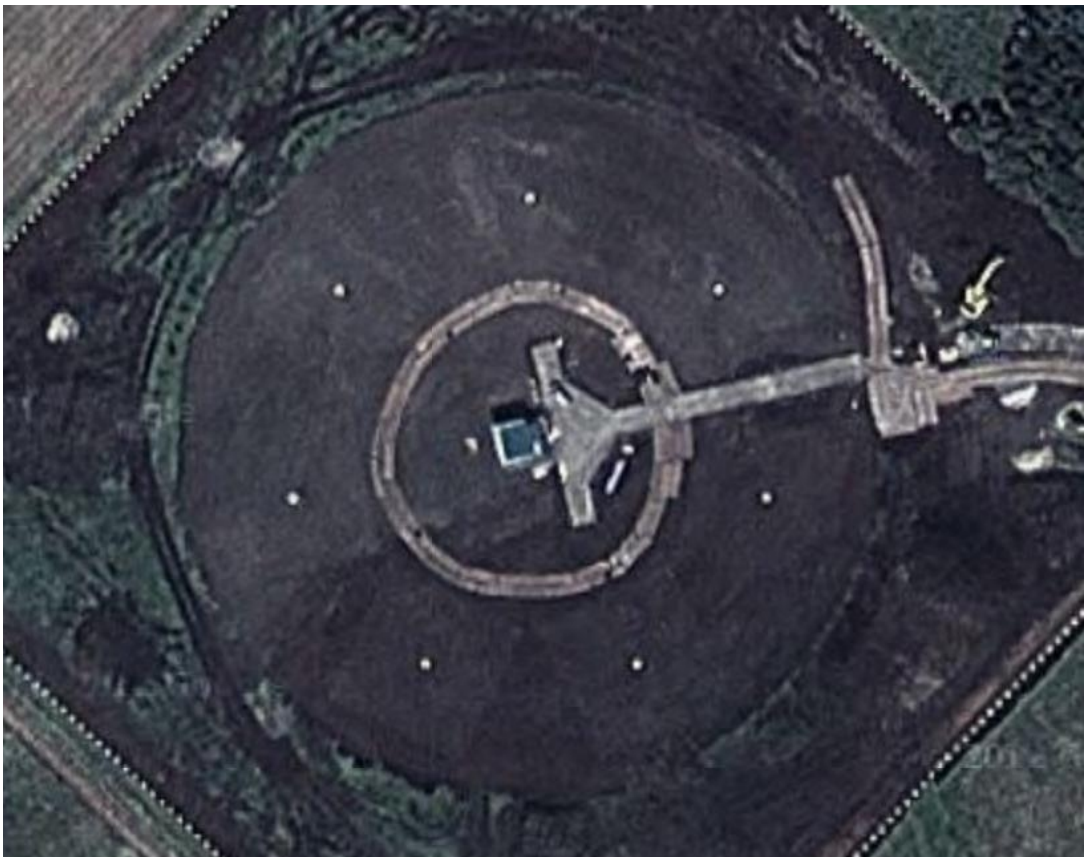
7 September 2011

Plate 44

7 –element CDAA, JGSDF Coastal Observation Unit 302,

JASDF SIGINT site, Nemuro,

GoogleEarth imagery, 3 September 2010



Chapter 7
Higashi Chitose

Located about 35 km southeast of Sapporo, in the southwest part of Hokkaido, the Chitose station is the principal Japanese SIGINT station for monitoring Russian signals traffic, and, indeed, is perhaps Japan's largest SIGINT complex. It maintains detachments at Wakkanai, Higashi Nemuro and Okushiri Island.

For more than a quarter of a century, from 1945 to 1971, it was the US Army Security Agency's (ASA's) main station in Japan for intercepting Soviet signals in the Far East. Officially titled the 12th ASA Field Station, and also called Kuma Station, it consisted of three sections: Chitose I, south of the city of Chitose, which was jointly occupied by Headquarters personnel, US military dependents, and some 5,000 JASDF personnel; Chitose II, east of the city, which comprised the transmitter and receiver/DF sites; and Chitose III, northeast of the city, which contained the Operations area. A still-classified number of Japanese citizens worked at the station. The Field Station was closed on 31 March 1971.

There are currently about 18 antenna systems at the station. (Plate 45) These include a large Miho-type Wullenweber CDAA, with 36 HF and 72 VHF elements, which was constructed in 1987; a smaller 8-element CDAA constructed around 2008-09; six satellite communication (Satcom) antennas enclosed in radomes; a large HF array, strung between several tall towers; four VHF log-periodic antennas mounted on the Wullenmeber CDAA; and several other VHF/UHF LPAs. (Plates 46 and 47)

There has been little significant change with these antenna systems since the late 1980s, except with respect to the new 8-element CDAA and the number and type of Satcom systems. According to an account compiled in November 1988, there were then 13 antenna systems at the station, consisting of the large Wullenweber CDAA; a five-element HF multi-band array; four VHF log-periodic antennas on the CDAA; two VHF/UHF LPAs; one UHF LPA; two other VHF

antennas; and two Satcom antennas enclosed in radomes.[112] New construction activity at the station was reported in 1991; a portion of the CDAA was also replaced in 1991.[113]

The two Satcom radomes noted in November 1988 were located near the northern boundary of the base, northeast of the CDAA and near the main operations area. GoogleEarth images of the base in 2006 showed that one of these had been removed. Only one was at this site in GoogleEarth imagery dated 13 October 2009 and 5 August 2010. However, Terraserver imagery dated 29 June 2010 shows another radome under construction, with the foundation finished, situated about 50 metres to the southwest of the previous one. It is shown completed in GoogleEarth imagery dated 6 April 2012. Both these radomes have diameters of about 26 metres. (Plate 48)

Three 17-metre diameter radomes, arrayed in a north-south line, had been installed in a separate compound about 500 metres southeast of the CDAA by October 1993, when they were photographed by Hokkaido peace researchers.[114] They were evident in GE imagery in 2003, as well as higher-resolution imagery dated 13 October 2009 and 5 August 2010. A fourth radome at this site is shown under construction in Terraserver imagery dated 29 June 2010; it is shown completed in GoogleEarth imagery dated 6 April 2012. It is about 23 metres in diameter. (Plate 49) Some of the Satcom antennas are probably used to intercept transmissions from Russia's elliptically-orbiting *Molniya* and geostationary *Gorizont* communications satellites.[115]

---

[112]「情報収集基地について」、佐藤裕二（著）、『'88 年日本平和大会：第 6 分科会「なくそう！核戦争用 C3I」資料』1988 年 11 月 19 日, [Sato Yuji, 'Intelligence Collection Bases in Japan', Materials for Section 6, 'Close C^3I for Nuclear Use', Japan Peace Committee Conference, 19 November 1988].

[113]『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 C^3I 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. 13-16; and『安保、自衛隊そして憲法と北海道』、日本平和大会北海道実行委員会, [*The Alliance, the SDF, the Constitution and Hokkaido*, Hokkaido Action Committee, Japan Peace Conference, October 1991], p. 14.

[114] Matsui, 'Looking at New Developments', pp. 13-16.

[115] Jeffrey T. Richelson, *Foreign Intelligence Organizations*, (Ballinger, Cambridge, Massachusetts, 1988), p. 257; and Desmond Ball, *Signals Intelligence in the Post-Cold War Era: Developments in the Asia-Pacific Region,* (Institute of Southeast Studies, Singapore, 1993), pp. 103, 104.

The smaller CDAA, which has eight tall antenna masts, is located on the northeast side of the operations building, or about 300 metres northeast of the large Miho-type system. It is clearly shown in high-resolution GoogleEarth imagery dated 13 October 2009 and 5 August 2010. The diameter of the circular ground mat is just over 200 metres, while the diameter of the circle described by the antenna masts is about 150 metres. It is a strange design. The masts are placed at 48-degree intervals, except for two which are 24 degrees apart. (Plate 50)

Two specialists from the NSA HQ at Fort Meade in Maryland visited Chitose during 2013. The first, who also visited the SIGINT Directorate in Tokyo, was in April and involved a review of the IBIS-1 Program, otherwise unidentified. The second, from 18 to 25 August 2013, was an NSA Space Systems Analyst, and may have been concerned with the two new radomes installed in 2010-12.[116]

[116] 'Semiannual Report of Payments Accepted from a Non-Federal Source: National Security Agency', at http://cryptome.org/2014/07/nsa-fy13-semiannual-report.pdf.

Plate 45

DIH SIGINT station, Higashi Chitose,

GoogleEarth imagery,

6 April 2012

Plate 46

36-element CDAA, DIH SIGINT station, Higashi Chitose,

GoogleEarth imagery, 6 April 2012

Plate 47

36-element CDAA,

DIH SIGINT station, Higashi Chitose,

13 September 2011

Plate 48

Two radomes on the eastern side of the main operations area,

DIH SIGINT station, Higashi Chitose,

GoogleEarth imagery,

6 April 2012

Plate 49

Four radomes, DIH SIGINT station, Higashi Chitose,

GoogleEarth imagery,

6 April 2012

Plate 50

8-element CDAA, DIH SIGINT station, Higashi Chitose,

GoogleEarth imagery,

6 April 2012

Chapter 8

Okushiri Island

In early 1990, the JDA opened a new SIGINT station on Okushiri Island, a sleepy place with a total population of about 5,300, small fishing villages and beautiful coastal scenery, in the Sea of Japan, about 620 km east of Vladivostok and about 20 km west of the southwest corner of Hokkaido. It is situated on a flat area on top of Kamoseki-yama, at an altitude of about 570 metres, about one kilometer southwest of the JASDF's J/FPS-3 JADGE station, with two large radomes, atop Kamui-yama, on the western side of the island. In the 1950s, the USAFSS station at Misawa maintained a unit on Okushiri (initially designated Detachment 3 of the 1st RSM, and after 1955 Detachment 3 of the 6921st RGM).[117] It was concerned with intercepting Soviet Air Force signals.

It was reported in the US in December 1983 that Japan planned 'to install a new facility [off the west coast of Hokkaido] to monitor Soviet communications in Siberia', and that it was 'projected to be completed in about six years'.[118] It was reported in September 1989 that an 'electronic intelligence-gathering station' was being built on Okushiri and that it would be commissioned in fiscal year 1990 (i.e., after 1 April 1990).[119] It achieved an initial operational capability (IOC) around May 1990, although construction had not been completed.[120]

'Service trials' of the SIGINT system, officially designated a J/FLR-3, were conducted by the JASDF's Air Development and Test Command through 1991, before the station achieved its full operational capability.[121]

Organisationally, the station on Okushiri is a detachment from the DIH/JGSDF base at Chitose.[122] However, it is primarily operated by the JASDF's Air Intelligence Collection Unit No. 3.[123]

---

[117] Richard R. Ferry, *A Special Historical Study of the Organizational Development of the USAFSS, 1948-1962*, (United States Air Force Security Service, Kelly AFB, San Antonio, Texas, 15 February 1963), pp. 52, 58.
[118] 'Filter Center', *Aviation Week & Space Technology*, 19 December 1983, p. 73.
[119] 'Japan Expands F-15 Units', *Flight International*, 23 September 1989, p. 9.
[120] *Asian Defence Journal*, May 1990, p. 107.
[121] 航空自衛隊 、 航空開発実験集団、 平成 23 年度版, [JASDF, Air Development and Test Command, 2011], at http://www.mod.go.jp/j/presiding/touben/173kai/san/tou51.html.

According to Japanese peace researchers, the station was considerably expanded by further construction in 1991-92.[124] One group which visited the site in spring 1993 took photographs which showed two SIGINT towers and at least five radomes installed in a row next to a large operations building, although they thought that there were several more radomes not clearly discernable from outside the site.[125] The station was severely damaged by the earthquake which hit Okushiri on 12 July 1993, and which devastated the western and southern coastal areas of the island and killed some 239 people. Some of the foundations of various buildings gave way, walls collapsed, and equipment was dislodged. A photograph published in *Mainichi Shimbun* on 15 July shows a jagged tear in one of the larger radomes at the site. (Plate 51)[126]

An aerial photograph of the site around 1999 shows 11 structures, including two SIGINT towers and nine radomes, in a north-south row, while GoogleEarth imagery since 2003 has shown 13, with two new small radomes located fifth from the northern end and at the southern end of the row. (Plate 52 shows GoogleEarth imagery dated 8 October 2014) It is evidently a rough composite of the VHF, UHF and SHF elements of the much-evolved AN/FLR-12 at Wakkanai and the J/FLR-2 at Nemuro.

The two northern-most structures are two-tiered SIGINT towers. In the case of the first one, the largest of the 13 structures, the lower tier has a diameter of about 16.5 metres and the top tier a diameter of about 11 metres. The second tower is slightly smaller; the diameter of the lower tier is about 15 metres and the diameter of the upper tier about six metres. They are more like the dimensions of the US AN/FLR-12 than subsequent, wider J/FLR-4 systems. The

---

[122] *Tokyo Shimbun*, 13 August 1998, p. 1, (FBIS-EAS-98-301, East Asia, 28 October 1998).
[123]『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 C^3I 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. 4.
[124]『安保、自衛隊そして憲法と北海道』、日本平和大会北海道実行委員会 (The Alliance, the SDF, the Constitution and Hokkaido, Hokkaido Action Committee, Japan Peace Conference, October 1991), p. 14.
[125] Matsui, 'Looking at New Developments', p. 4.
[126]「 大きな穴が空自レーダーサイト・奥尻島」、毎日新聞、1993 年 07 月 14 日, ['Okushiri Radar Site Damaged', *Mainichi Shimbun*, 15 July 1993].

diameters of the 11 domes, running from north to south, are 10, 6, 4, 9, 3, 6, 10, 10, 6, 3 (on top of a short 4.5 metre wide tower) and 3 metres.

Contracts are regularly awarded to Toshiba by the JASDF for repair and maintenance of the J/FLR-3 SIGINT system. In September 2005, Toshiba was awarded a contract for 23,919,000 yen for 'regular repair' of a J/FLR-3 'ground radio-wave measurement system'.[127] In May 2006, it received a contract for 5,565,000 yen for 'preliminary surveys' of the 'regular repair' requirements of a J/FLR-3 system.[128] In August 2006, it received another contract for 25,823,700 yen for 'regular repair' of a J/FLR-3 system.[129] In September 2006, it received a contract for 30,810,150 yen to provide 29 'maintenance equipment items', being 'components of the J/FLR-3 radio-wave measurement system'.[130]

In July 2008, the Ministry of Defense requested applications for contracts for 53 J/FLR-3 components. These were all for equipping an operations room, such as magnetic tape units, disc drives, display screens, network analysers, 'record controllers', and keyboards.[131] They suggest that the operations room at the Okushiri J/FLR-3 station was being substantially refurbished.

On 14 March 2011, the Ministry of Defense, on behalf of the JASDF, announced contract notices for several J/FLR-3 components, including an Electronic Counter-measures (ECM) unit.[132] This presumably includes a 'radio-wave jamming system' similar to that installed at the JASDF's J/FLR-2 station at

---

[127] 随意契約一覧表、平成 17 年 9 月、航空自衛隊第 3 補給処, 埼玉県狭山市, ['Table of Contracts, September 2005', JASDF 3rd Supply Depot, Sayama, Saitama-ken, at http://www.dii.jda.go.jp/asdf/3depotprocure/sonota/zuikei/riyuu/1709.pdf.

[128] 随意契約一覧表、平成 18 年 5 月、航空自衛隊第 3 補給処, 埼玉県狭山市, ['Table of Contracts, May 2006', JASDF 3rd Supply Depot, Sayama, Saitama-ken], at http://www.mod.go.jp/asdf/3dep/sonota/zuikei/riyuu/1805.pdf.

[129] 随意契約一覧表、平成 18 年 8 月、航空自衛隊第 3 補給処, 埼玉県狭山市, ['Table of Contracts, August 2006', JASDF 3rd Supply Depot, Sayama, Saitama-ken], at http://www.dii.jda.go.jp/asdf/3depotprocure/sonota/zuikei/riyuu/1808.pdf.

[130] 随意契約一覧表、平成 18 年 5 月、航空自衛隊第 3 補給処, 埼玉県狭山市, ['Table of Contracts, September 2006', JASDF 3rd Supply Depot, Sayama, Saitama-ken], at http://www.mod.go.jp/asdf/3dep/sonota/zuikei/riyuu/1809.pdf.

[131] 'Guidelines for Applicants for Parts for Communications and Electronic Equipment, Fiscal Year 2008', Ministry of Defense, 20 July 2008, at http://www.mod.go.jp/asdf/3dep/koubooyobikikaku/pdf/20_kouji171.pdf.

[132] 公示第 49 号, 平成 23 年 3 月 14 日, 変更公示, 分任支出負担行為担当官, 航空自衛隊第 3 補給処長, 小嶋 信義, [Notice of change, Public Notice No. 49, 14 March 2011, Officer responsible: Kojima Nobuyoshi, Head, JASDF 3rd Supply Depot], item 4097, at http://www.mod.go.jp/asdf/3dep/koubooyobikikakukyousou/kouji_pdf/230314kouji49.pdf.

Nemuro. It also announced a requirement for a Bearing Azimuth unit for the J/FLR-3 system, evincing a DF capability at Okushiri.[133]

[133] *Ibid*, item 4080.

Plate 51

JASDF J/FLR-3 SIGINT station, Okushiri, July 1993

Source: *Mainichi Shimbun,* 15 July 1993

Plate 52

JASDF J/FLR-3 SIGINT station, Okushiri,

GoogleEarth imagery,

8 October 2014

Chapter 9

Kobunato

Kobunato is located near Shibata (37° 57′ N, 139° 20′ E) in Niigata Prefecture, about two thirds of the way up the west coast of Honshu, at the same latitude as Panmunjon in the DMZ on the Korean Peninsula, just over 1,000 km across the Sea of Japan from Vladivostok. (Shibata was also the site of a Japanese SIGINT station during the Second World War).[134] The Kobunato station has a particular responsibility for monitoring transmissions in the Sea of Japan and the Soviet/Russian maritime provinces. Until the late 1980s, it was mainly concerned with intercepting Soviet Army communications, for which it engaged six units.[135] A 36-element HF DF CDAA system was installed in 1988, which greatly enhanced its ocean surveillance capability as well as its more general HF interception and DF capabilities. This was replaced by a new 7-element system, installed at the same site, around 2009.

There are nearly 30 identifiable antenna systems at Kobunato, including several used for administrative and other telecommunications purposes (such as television reception). More than a dozen are used for SIGINT collection. In addition to the CDAA, the HF antenna systems consist of a HF horizontal wide-band doublet antenna, strung from four tall towers, configured as a trapezium, with the shortest of the parallel sides facing north-northwest, which was installed before November 1982; a HF inverted L-type antenna, strung between two of the towers supporting the doublets, also installed before November 1982; two HF vertical antennas, each with five antenna lines arranged in three dimensions, located at the northeast side of the doublet system, and also installed before November 1982; and two large vertical HF curtain arrays, shown in photographs taken in September 2005 and April 2007, each of which has 25

[134] *Operational History of Japanese Naval Communications, December 1941-August 1945,* p. 19.
[135]「情報収集基地について」、佐藤裕二（著）、『'88 年日本平和大会：第 6 分科会「なくそう！核戦争用 C3I」資料』1988 年 11 月 19 日, [Sato Yuji, 'Intelligence Collection Bases in Japan', Materials for Section 6, 'Close C^3I for Nuclear Use', Japan Peace Committee Conference, 19 November 1988].

vertical wires.[136] (Plate 53 provides a schematic of the station and its antenna systems in 1984. Plates 54 and 55 show the two HF curtain arrays).

The VHF systems include a horizontal LPA, probably installed in 1984, on the top of the southern-most of the towers supporting the doublets; a tower with three VHF LPAs, also installed around 1984; and another tower with three VHF LPAs which was installed after November 1988. The three LPAs installed around 1984 cover the lower part of the VHF band (i.e., around 50-100 MHz). Inputs from the three antennas are combined to increase the gain. Motors allow the antennas to move 90 degrees, hence providing vertical as well as horizontal polarisation. (Plate 56) In addition, there are a UHF yagi antenna, a VHF yagi antenna, and a small microwave dish on the main office building near the main entrance. There are also two towers with a variety of VHF and UHF antenna systems, including two VHF yagi antennas, four VHF whip antennas, a complex UHF interception and DF array, and three small microwave dishes.[137]

There have been numerous changes at the station since 1982, when peace researchers began to systematically catalogue its antenna systems. In 1982, there was a HF loop array, with 16 double-loop elements, each 92-cm in diameter, manufactured by Hermes Electronics Limited, in Dartmouth, Novia Scotia, Canada, and aligned at 40° (i.e. running in a northeast-southwest line). (Plate 57) It was removed in early 1988, and a new Type 612 HF loop array, with 15 elements, was installed in August 1988. The loops were slightly flattened, measuring about 1.5 metres high and 2 metres across. (Plates 58 and 59) It was photographed in July 1992 but was removed around 1995.[138]

In 1982, there was a HF vertically-polarised LPA, configured as a trapezoid curtain array, with the axis oriented towards the north, located in the

[136]Sato, 'Intelligence Collection Bases in Japan'; and「防衛省情報本部、 小舟渡通信所（受信所）」、『アンテナの見える風景』、2007 年 4 月, ['Defense Intelligence Headquarters Kobunato Communications Station', *Antenna Scenes,* April 2007], at http://home.p04.itscom.net/yama/Kofunato/Kofunato.htm.
[137]Sato, 'Intelligence Collection Bases in Japan'; and 'Defense Intelligence Headquarters Kobunato Communications Station'.
[138] Sato, 'Intelligence Collection Bases in Japan'; and photographs of Kobunato taken in 1988, 1991 and 1992 by Sato Yuji.

northeast part of the base. Its orientation was reckoned to be 319° in 1984.[139] It had been replaced by the two large vertical curtain arrays by 2005.

The station had two 8-element Adcock HF DF systems in 1982. One, with eight 26-metre masts, was located on a 3,000 square metre site about 700 metres north of the main base. It was dismantled in early 1988 (although the goniometer hut was still there in April), to make way for the new CDAA. The second, with eight 7-metre masts, was located about 700 metres northeast of the main base; it was still there in 1991, but was evidently removed soon after. A Type 7029 rotatable crossed VHF/UHF LPA, located in the southeast corner of the main base through the 1980s, has also been removed.[140]

The 36-element Doppler-type HF DF CDAA installed in August-November 1988 was situated 700 metres north of the main base, at the site where the 26-metre Adcock HF DF antenna had previously been located.[141] In March 1987, the Defence Facilities Agency acquired an additional 9,000 square metres of adjoining land, taking the site to 12,000 square metres (110 metres x 110 metres), with rice fields on the eastern perimeter and small sand dunes on the side facing the Sea of Japan. The CDAA consisted of two groups of 18 masts arranged in concentric circles, with a small building in the centre; measuring 4-metres by 4-metres square and 2.5 metres high, it was installed in August 1988. The earth-mat, covering 3,000 square metres, was made of SUS Series 300 stainless steel, with 0.3-mm diameter wire mesh on 10-mm diameter rods, and

---

139 「小舟渡通信所『象の折』、調査報告」、新潟平和委員会、1988 年 11 月 8 日, [Report of an Investigation into the Kobunato Communications Station "Elephant Cage", Niigata Prefecture Peace Committee, November 8, 1988].

140 Sato, 'Intelligence Collection Bases in Japan'; and photographs of Kobunato taken in 1988, 1991 and 1992 by Sato Yuji.

141 The details of the design and construction of the 36-element CDAA in the 1988 'Report of an Investigation into the Kobunato Communications Station "Elephant Cage"', including the schematic of the CDAA in Plate 2 (a) were the result of regular observation of developments at the Kobunato base throughout 1987 and 1988 by local and regional peace groups. However, after meeting at a local church on Sunday, November 6th, 1988, a group of peace activists accompanied by Sato Yuji and Nishizawa Shu visited the CDAA construction site as they had in the past. However on this occasion nobody was present at the construction site, and the activists had unimpeded access, and proceeded to survey the site closely and accurately.

> 'Our surprise inspection on a Sunday meant that usual pattern of the guards from the watchtower and the main gate rushing to the "elephant cage", with their usual hovering around, "Who are you? What are you doing" challenges did not happen. No-one was to be seen in the watch-tower, and the entrance gate was open. As a result, this investigation was judged a success, as for the first time anywhere in the country, facilities under construction were able to be measured.'

was laid in November 1988. Cables connecting the 36 elements to the central building were buried 1.5 metres underground, and were also laid in November. The outer circle of antennas had a diameter of 80 metres; its 12-metre high antenna elements covered the lower part of the HF band. The inner circle was 27 metres in diameter; its 6-metre high antenna elements covered the higher part of the HF band. The system was manufactured by Koden Electronics Company and Toshiba, with the former constructing the antenna array and the latter responsible for more specialised electronic components.[142] (Plates 60, 61 and 62)

Koden Electronics Company, based in Tamagawa in Tokyo, produces a range of marine and industrial electronics products, including radio monitoring and DF systems. It says on its Website that its 'core technology' is called SWAT (Signal-processing and Wave-sensing Technology), which involves the fusion of advanced signal processing technology and radio-wave detection devices to provide precise measurement of signal parameters. Founded in 1947, it initially manufactured DF systems for the recovering Japanese fishing industry. It has produced numerous types of DF systems, covering the spectrum from MF through HF and VHF to UHF, such as the KDF-580 MF/HF DF system, the KDF-538 VHF DF system, the KDF-581 UHF DF system, and the 555A DF system, which can receive in several bands used for maritime communications. Its Website highlights its 'land based radio monitoring systems', and shows one of its VHF/UHF DF systems.[143] Koden presumably also built the 36-element CDAAs at Wakkanai and Higashi Nemuro in the late 1980s and early 1990s.

The 36-element system was still at Kobunato in Terraserver imagery dated 2 September 2008, but the new 7-element array was in place in imagery dated 19 July 2010. (Plate 63 shows GoogleEarth imagery dated 31 May 2014)

[142] 'Report of an Investigation into the Kobunato Communications Station "Elephant Cage"'.
[143] Koden Electronics Co., 'Land Based Radio Monitoring System', at http://www.koden-electronics.co.jp/eng/rikutan-e.html.

Plate 53

DIH SIGINT station, Kobunato, February 1984

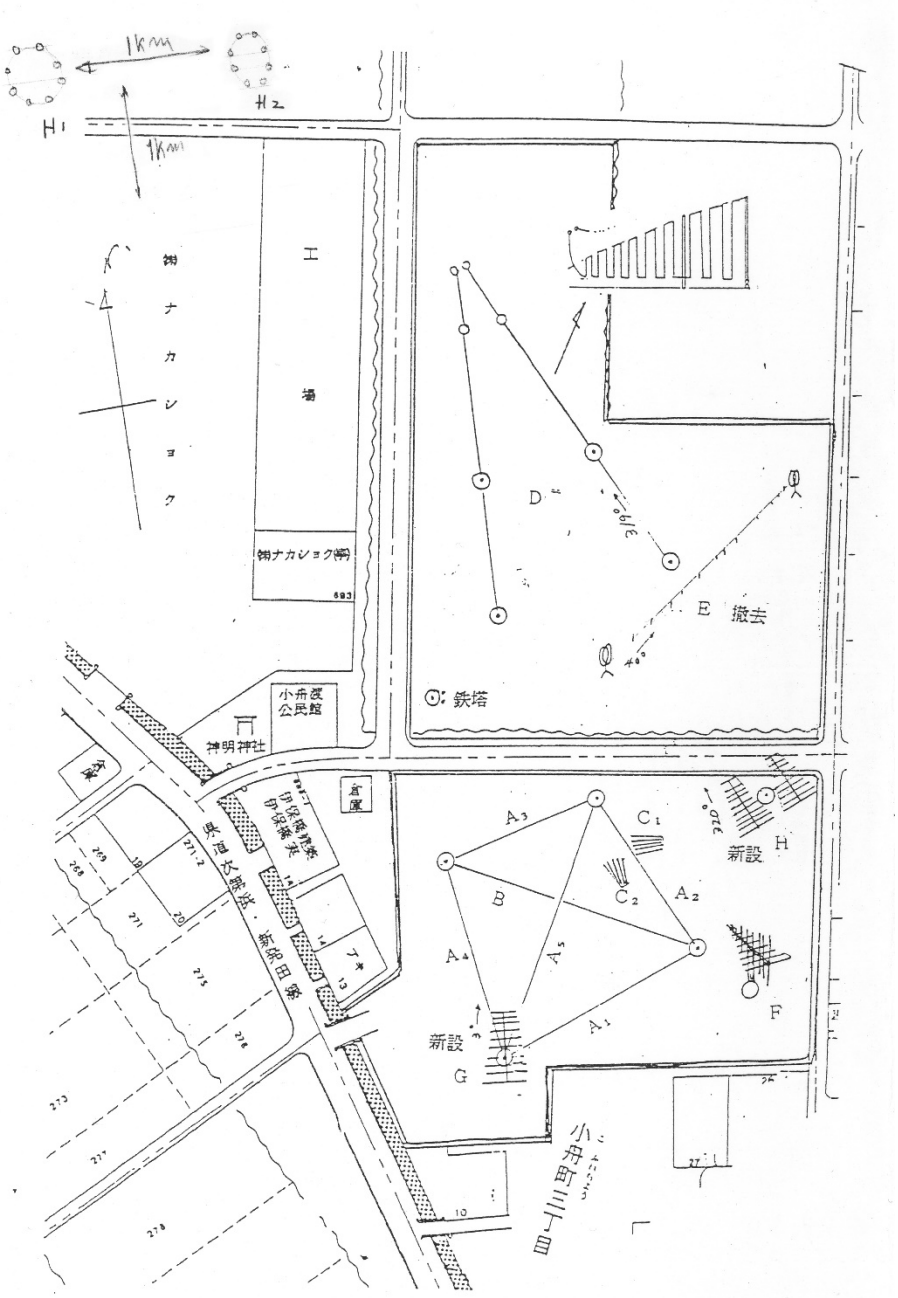


Plate 54

HF vertical curtain arrays, DIH SIGINT station, Kobunato,

11 September 2005

Plate 55

HF vertical curtain arrays,

DIH SIGINT station, Kobunato,

April 2007

Plate 56

Rotatable VHF LPAs, DIH SIGINT station, Kobunato,

11 September 2005

Plate 57

16-element Hermes double-loop antenna array,

DIH SIGINT station, Kobunato,

May 1988. (Removed soon thereafter)

Plate 58

15-element Type 612 loop array,

DIH SIGINT station, Kobunato,

October 1988.

(Removed around 1995)

Plate 59

15-element Type 612 loop array,

DIH SIGINT station, Kobunato,

October 1988.

(Removed around 1995)

Plate 60

36-element HF DF CDAA,

DIH SIGINT station, Kobunato,

13 July 1992

Plate 61

36-element CDAA,

DIH SIGINT station, Kobunato,

10 September 2005

Plate 62

36-element CDAA, Kobunato,

Bing imagery, 2009.

(Replaced by a 7-element CDAA in 2010)

Plate 63

7-element CDAA system,

DIH SIGINT station, Kobunato,

GoogleEarth imagery,

31 May 2014

Chapter 10

Ooi

The Ooi Communications Station is located on the northern side of the R163 in Shimoakasaka in Ooi-machi, in Iruma district in Saitama Prefecture, and is about 30 km northwest of central Tokyo. It is about seven km east of Iruma Air Base, or five km northwest of Owada, where the Imperial Navy had its main signal interception and network control station from 1936 to 1945, and 15 km northwest of the Army's former counterpart SIGINT control station at Tanashi. It is a former agricultural area, growing famous Sayama-cha tea and vegetables for the Tokyo market, with some remaining farms interspersed with factories and suburban houses. It was established in 1953.[144]

In November 1988 the government informed the Diet that in FY 1987 the Ooi Communications Station, a separate facility of the GSDF Staff Office Investigation Division, had a staff of at least 90, including 70 from the GSDF and 10 each from the MSDF and the ASDF, and a further unspecified number of other staff.[145] It reportedly also hosts US personnel from the 6290th Electronic Security Group (ESG) at Misawa.[146]

The site is 12 hectares, roughly rectangular in shape, about 500 metres by 200 metres in size. It comprises about 10 large buildings in the southwestern part of the site, two large (23-metre diameter) radomes in the middle, and an extensive HF antenna farm on the western side, which includes a number of rhombic antennas. One of the buildings has several antennas on the roof, including a small Satcom system.

---

144 Hideharu Torii, 'Japan's Secret SIGINT Organizations: Focusing on North Korea', *Popular Communications*, March 2007, p. 8.

145 吉川春子参議院議員が提出した自衛隊・米軍の通信基地の電波障害対策等に関する質問に対する、竹下登内閣総理大臣の答弁書、参議院議長土屋義彦殿、答弁書第一三号、内閣参質一一三第一三号, 昭和六十三年十一月一日、参議院、第 113 回国会, [Written answer to question by House of Councillors member Yoshikawa Haruko on responses to SDF and US Forces communications bases' radio wave interference, provided by House of Councillors Chairman Tsuchiya Yoshihiko, House of Councillors, National Diet of Japan, 1 November 1988].

146 「追跡！日本の無線傍受施設と米情報機関を結ぶ『線』」、Vladimir（著者）『公安アンダーワルド：日本の秘密情報機関』(別冊宝島 Real 012)、2001 年 4 月, [Vladimir, 'Chase! The tie between Japan's radio monitoring facilities and American intelligence agencies', in *Public Security Underworld: Japan's Secret Intelligence Agencies*, (Tokyo: Bessatsu Takarajima Real, No. 12, 2001], pp.148.

Two large radomes, which were about 20 metres in diameter, were probably installed in the 1990s; they are evident in an aerial photograph taken in about 2001, and *Asahi Shimbun* published a photograph of them in September 2004.[147] (Plate 64) Photographs taken in September 2003, August 2005 and June 2006 show about a dozen HF monopole and doublet arrays. (Plates 65 and 66) A tower on the southwest side of the base has a single microwave dish, pointing west-southwest.[148] A photograph published in 2007 also shows an 8-element circular Adcock HF DF array, similar to systems previously maintained at Tachiarai and Kikai-jima.[149] However, several visitors to the station since September 2003 have been unable to find it.

A third radome was installed by late 2009, about 25 metres north of the original two. The foundation for this radome was shown in GoogleEarth imagery dated 30 November 2008. (Plate 67) It is about 20 metres in diameter. Terraserver imagery dated 24 January 2010 shows the completed radome, with a diameter of about 23 metres. It is light green in colour.

There were further developments in 2011-13. The southwestern one of the original two radomes was removed in 2011; it is shown (together with the third radome) in Terraserver imagery dated 4 February 2011, but there is no trace of it in Terraserver imagery of 27 March 2012. On the other hand, Terraserver imagery dated 16 November 2012 shows considerable construction activity underway. The foundation for a new large radome had been built in the northeast part of the radome area. Sitting near the foundation was a Satcom dish, about 16 metres in diameter, presumably awaiting installation on it. A lovely photograph, probably taken from a helicopter, was published in *Asahi Shimbun* on 19 July 2013; it shows three radomes, with all construction activity finished

[147] 大井通信所 防衛情報本部、「インテリジェンス情報力、自衛隊 50 年」、朝日新聞 2004 年 9 月 24 日, [Ooi Communications Station, Defense Agency Intelligence Headquarters, in 'Intelligence Power: 50 Years of the Self Defence Forces', *Asahi Shimbun*, 21 September 2004].
[148] 「防衛省情報本部、大井通信所、(受信所) ）、『アンテナの見える風景』, ['Defence Intelligence Headquarters, Ooi Communications (Receiving) Station', *Antenna Scenes*, at http://home.p04.itscom.net/yama/Ooi/Ooi.htm.
[149] Hideharu Torii, 'Japan's Secret SIGINT Organizations: Focusing on North Korea', *Popular Communications*, March 2007, p. 10.

and construction materials removed from the site. The newest radome is coloured dark green. (Plate 68)[150]

GoogleEarth imagery dated 15 March 2014 shows only two 23-metre diameter radomes, the second of the original 20-metre radomes having been removed. (Plate 69) In addition, that imagery also clearly shows three very small radomes, only about 1.2 metres in diameter, near the operations area. They were not there in Terraserver imagery dated 29 November 2008, but were in Terraserver imagery dated 24 January 2010.

The Ooi station 'intercepts signals from China, Russia, and South Korea' and 'acts as a relay point for the stations across the nation'.[151] It also has several other roles, including some involving domestic surveillance. It reportedly monitors international satellite communications, including telephone, facsimile and e-mail traffic, presumably as the Japanese counterpart of and contribution to the UKUSA *Echelon* program. It is the main station concerned with intercepting diplomatic communications, both HF radio and Satcom, to selected Embassies, Consulates and other foreign Missions in Tokyo. It also has a counter-intelligence role, attempting to intercept the communications of foreign intelligence agents operating in the Tokyo area.

The Satcom systems may have originally been designed primarily for interception of the down-links of so-called 'store-dump' communications satellites used by the Soviet/Russian civilian and military intelligence agencies, the KGB/SVR and the GRU, and respectively called *Amherst* and *Strela* (or *Yanina*), for communicating with their 'Residences' in the Russian Embassy in Tokyo and their agents in the area.[152]

The Ooi station also serves as the nodal point in a nation-wide microwave network operated by the JGSDF's No. 4 Communications Section. It maintains dedicated microwave relay links with all the DIH/JGSDF SIGINT bases, as well as with a counterpart section in the Communications Building at the MoD HQ at

---

[150] Yoshihiro Makino, 'Japan Dropped Plan for Eavesdropping Network, Still Relies on U.S.', Asia and Japan Watch, *Asahi Shimbun*, 19 July 2013, photograph by Satoru Ogawa, at http://ajw.asahi.com/article/behind_news/politics/AJ201307190076.
[151] *Ibid*, p. 9.
[152] Mike Frost, *Spyworld: Inside the Canadian and American Intelligence Establishments*, (Doubleday Canada, Toronto, 1994), pp. 78-84.

Ichigaya. It has been speculated that the unit might also be engaged in monitoring domestic microwave circuits.[153]

In addition to its operational roles, the station also has an educational and training role due to its proximity to the HQ at Ichigaya.[154] In FY2005 Fuji Security Systems was paid 27,934,200 yen for 'warning and surveillance services', in particular 'upgrading highly concealed protective surveillance equipment' at Ooi, a facility with a "critical role in signals intelligence'.[155] The FY2015 defence budget allocated approximately 100 million for building reconstruction equipment upgrading at the station.[156]

[153] Vladimir, 'Chase! The tie between Japan's radio monitoring facilities and American intelligence agencies', p. 147.
[154] *Radio Life*, (No. 4, 1988); and Torii, 'Japan's Secret SIGINT Organizations', p. 9.
[155]平成 17 年度 所管公益法人等との間で締結された随意契約の緊急点検結果等について(防衛本省), ['Results of urgent inspections of FY2005 negotiated contracts of public service corporations (Ministry of Defense)'], item 8231, p.8, at http://www.mod.go.jp/j/procurement/tekiseika/pdf/koueki/h17-mod-03.pdf
[156] 「関東地方の主な米軍・自衛隊施設に関する 2014 年度補正予算案及び 2015 年度予算案について」, 塩川鉄也（著者）, Blogos, 2015 年 01 月 24 日, [Shiokawa Tetsuya, 'The major US forces and the SDF fiscal 2014 supplementary budget related to facilities in the Kanto region and budget in fiscal 2015', Blogos, 24 January 2015], at http://blogos.com/article/104170/

Plate 64

JGSDF/DIH SIGINT station Ooi,

(with two 20-metre radomes),

GoogleEarth imagery, c2006

Plate 65

HF antenna (East side of the compound),

JGSDF/DIH SIGINT station Ooi,

3 September 2011

Plate 66

HF antenna (West side of the compound),

JGSDF/DIH SIGINT station Ooi,

3 September 2011

Plate 67

Two 20-metre radomes

and third radome under construction,

JGSDF/DIH SIGINT station Ooi,

GoogleEarth imagery,

30 November 2008

Plate 68

Three radomes (one 20-metre and two 23-metre)

at JGSDF/DIH SIGINT station Ooi,

19 July 2013

Source: Satoru Ogawa, *Asahi Shimbun*, 19 July 2013

Plate 69

Two 23-metre radomes,

JGSDF/DIH SIGINT station Ooi,

GoogleEarth imagery,

15 March 2014

Chapter 11

Miho

The Miho Communications Station, which is the main station for monitoring signals in North Korea, and was until the early 2000s the second most important Japanese SIGINT station, is located in Tottori Prefecture on the Shimane Peninsula near the towns of Yonaga and Sakai-minato, facing Miho-wan Bay. It is the closest point in Japan to North Korea, with Wonsan (North Korea's main east coast naval base) just over 600 km to the northwest and Chongjin (North Korea's northern port) another 800 km further north. It is situated beside a busy road, highway 47, one used by many tourists; there are no signs whatsoever at the guard post at the main entrance off this road.

The Wullenweber CDAA at Miho was the first of its type to be constructed in Japan, becoming operational in 1977. It was reportedly a British design, and consists of two concentric circles – a 156-metre diameter circle of 36 towers, each 36 metres high, with vertical wires hung from each tower, and an outer ring of 72 20-metre high VHF monopoles.[157] In addition to the CDAA, there are four VHF log-periodic antennas mounted on the CDAA, at 90^{o} intervals, and a couple of other log-periodic systems located in the grounds. (Plates 70-74)

The antenna systems at the Miho station have hardly changed since the 1980s. A review by Sato Yuji in November 1988, for example, noted that in addition to the CDAA and its four VHF LPAs, there was then a rotatable crossed VHF/UHF LPA and a 9-element VHF LPA.[158] Photographs taken in 1984 show an 8-element Adcock HF DF located near the CDAA (Plate 75), but it was not listed in the 1988 survey, and it is not discernible in more recent GoogleEarth images.

The Miho station had a staff of 120, from all three Services, in November 1988. They formed 10 units, two concerned with the North Korean Army, three

[157] Undated note on the Miho station in files provided by Owen Wilkes.
[158]「情報収集基地にづいて 」、佐藤裕二（著）、『'88 年日本平和 大会：第 6 分科会「なくそう！核戦争用 C3I」資料』、1988 年 11 月 19 日 (Sato Yuji, 'Intelligence Collection Bases in Japan', Materials for Section 6, 'Close C^{3}I for Nuclear Use', Japan Peace Committee Conference, 19 November 1988).

with the North Korean Navy, four with the North Korean Air Force, and one 'General'.[159]

There is also a large JASDF JADGE station on Takao-yama, the hill behind the CDAA, which is equipped with two J/FPS-4 radomes, two VHF/UHF aeronautical communications antennas, two pair of VHF tropospheric antennas, a microwave dish, HF dipoles, and a meteorological station. It was reported in 1998 that a COMINT unit from the Miho station had also been established within the JADGE base on Takao-yama, focusing specifically on North Korean aeronautical communications.[160]

The Miho station has been very successful. It has generally kept the Cabinet and MoD well informed regarding political and military developments in North Korea. Its coverage also includes North Korea's naval and air activities in the Sea of Japan, as well as North Korean intrusions into Japan's ADIZ. However, its effectiveness has sometimes been nullified in crisis situations by poor communications between the Chobetsu and other MoD and JSDF agencies.

In July 1993, when Pyongyang announced the death of Kim Il-song, the Miho station was alerted to monitor all North Korean circuits and frequencies to ascertain his cause of death and to search for signs of military movements and possible coup preparations. It provided most of the intelligence used in a report presented to the Cabinet on 10 July that the North Korean leader had died of a heart attack, a natural death, and that there was no evidence of coup activity.[161]

On 18 December 1998, the Miho station intercepted the radio communications involved in an incident in which South Korean naval and air forces chased a North Korean submersible vessel from inside South Korean waters and sank it in the high seas off Kyushu.[162] On 21 March 1999, the station

---

[159] *Ibid*.
[160] 「防衛情報」、 Der Angriff ホームページ』、1998 年 5 月 28 日, ['Defense Information', *Der Angriff* , 25 May 1998], at http://obuchi.naikaku.com/angriff/log/oldmain/03/na980505.html.
[161] 'Rabbits' Ears and Doves' Dreams: Information on North Korea's Missile Test-Firing Kept Secret – Only Bureaucrats Discuss Information With Foreign Minister and Others Kept in the Dark', *Mainichi Shimbun*, 14 August 1994, p. 1. (FBIS Translated Text), at http://fas.org/news/japan/eas95192.htm.
[162] *Tokyo Shimbun*, 9 January 1999, in American Embassy, Tokyo, 'Daily Summary of Japanese Press', 13 January 1999.

monitored the communications of two North Korean vessels which entered Japan's ADIZ off Noto Peninsula, where they stayed until they were chased out by the JMSDF on 24 March. The signals transmitted by the North Korean boats were encrypted. On the morning of 25 March, radio intercepts disclosed that the two suspicious vessels had entered Chongjin harbour.[163]

[163] 'Probe into the Responses Made by the Government to Suspicious Boats – Government Cautious with Eye on Relations with China, Russia ROK, while MSDF, MSA Groped for Effective Means to Pursue Them, Part 2', *Asahi Shimbun*, 7 April 1999, in American Embassy, Tokyo, 'Daily Summary of Japanese Press', 12 April 1999, at http://www.usc.edu/isd/archives/dsjp/summaries/1999/April/Sm990412.doc.

Plate 70

CDAA at DIH SIGINT station, Miho, May 1981

Plate 71

CDAA at DIH SIGINT station, Miho, May 1981

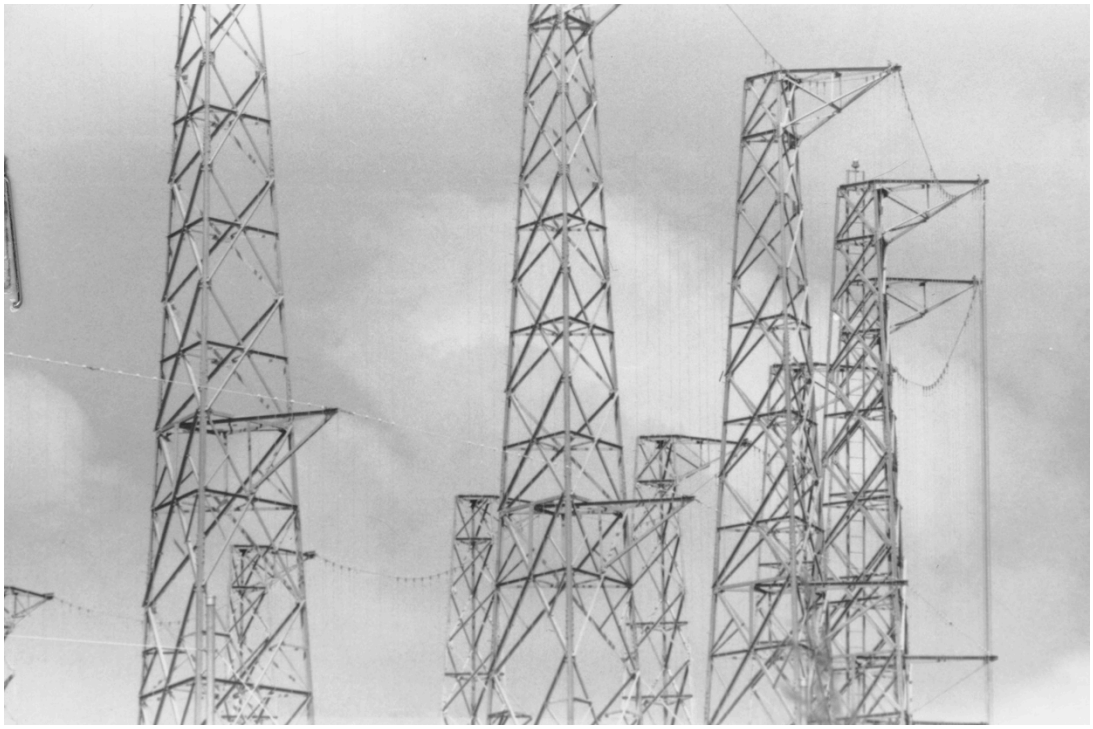


Plate 72

CDAA at DIH SIGINT station, Miho,

GoogleEarth imagery, 28 June 2011

Plate 73

CDAA at DIH SIGINT station, Miho,

February 2003

Plate 74

DIH SIGINT station, Miho,

GoogleEarth Street view image,

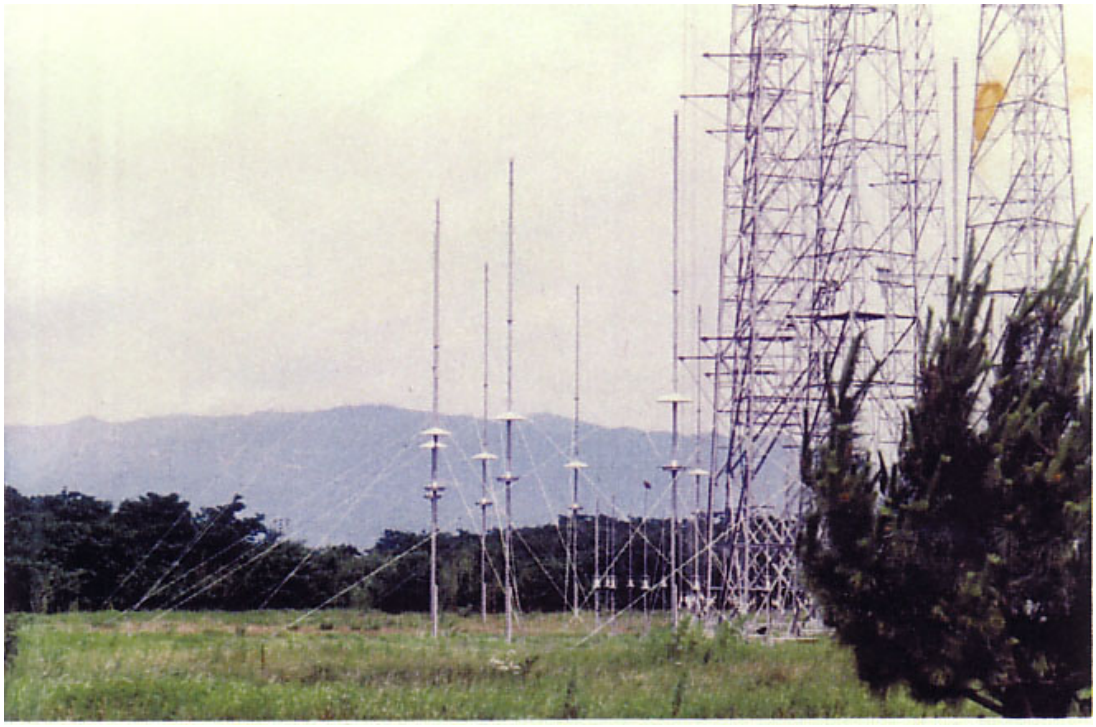
October 2012

Source: GoogleEarth
https://www.google.com.au/maps/@35.508167,133.223714,3a,45.6y,344.07h,92.99t/data=!3m4!1e1!3m2!1sywg0uAcgq1m2HMSvx3sJTg!2e0

Plate 75

DIH SIGINT station, Miho, 1984

(Note 8-element HF DF array centre rear)



Source: Sato Yuji

Chapter 12
Tachiarai

Since the early 1960s, Japan has had two principal SIGINT stations for intercepting Chinese communications – Tachiarai Communications Station and Kikai-jima Communications Station, which lie across the East China Sea from Jiangsu and Zhejiang provinces of China respectively. Tachiarai is in Fukuoka Prefecture, on the northern side of the island of Kyushu, just across the Korea Strait from South Korea. The station is situated astride highway 593, between the small towns of Shimotakaba and Yasuno, in Chikuzen Township, about three km northwest of Tachiarai, or about 25 km south of Fukuoka Airport. Highway 593 divides it into two parts, the northern part containing the HQ, main operations building, two large Satcom radomes and the HF and VHF/UHF antenna systems; and the southern part which had four large Satcom radomes and five small ones, together with associated buildings, in December 2013. (Plates 76 and 77)

The Tachiarai station was established in 1961. It was staffed with 19 units in 1988, many more than any other station. Seven were concerned with the Chinese Army, one with the Chinese Navy, eight with the Chinese Air Force and three with 'General' Chinese communications.[164] In addition, it is clear from the orientation of some of the antennas, noted at different times over the past two decades, that the station also monitors HF and VHF signals emanating from the Korean Peninsula.

The Tachiarai station is renowed for intercepting the communications associated with former Chinese Communist Party Vice-Chairman Lin Biao's attempt to defect to the Soviet Union on the night of 12-13 September 1971 and his death when his Trident aircraft crashed in Mongolia.[165]

---

[164] [164] 情報収集基地につい て 」、佐藤裕二（著）、『'88 年日本平和 大会：第 6 分科会「なくそう！核戦争用 C3I」資料』、1988 年 11 月 19 日 (Sato Yuji, 'Intelligence Collection Bases in Japan', Materials for Section 6, 'Close C^3I for Nuclear Use', Japan Peace Committee Conference, 19 November 1988).

[165] 'Japan's Sanctuary: The Defense Intelligence Headquarters', *Sentaku*, May 1997, pp. 126-129, (FBIS-EAS-97-150, Northeast Asia, 1 May 1997).

The Tachiarai Communications Station currently had 18 antenna systems in December 2013, consisting of eleven Satcom radomes, two in the northern part and nine in the southern part; a US Model 524-type wide-aperture Super High Gain horizontal HF curtain LPA, located on the northwestern side of the northern part; a rotatable VHF/UHF crossed log-periodic antenna, two rotatable VHF log-periodic antennas, and two fixed VHF log-periodic antennas, pointing towards 266° and 338° (Shanghai and North Korea), located near the operations building; and a new 7-element array located about a kilometer northwest of the main site.

This represents a substantial change over the past two decades, during which the number of HF antenna systems increased then fell, while the number of Satcom radomes has steadily expanded. In 1988, the Tachiarai station had about a dozen antenna systems, including two rhombic HF systems, with the longitudinal axes pointing towards 320° (the Korean Peninsula) and 303° (northeast China), located on the northern and southern sides of the main complex; six HF doublet antennas, located on the northeastern side of the operations building, in the middle of the main base; a rotatable VHF/UHF crossed log-periodic antenna, usually directed at 262° (Shanghai), located on the northern side of the operations building; two US Model 527B horizontal HF Super Gain log-periodic antennas aimed towards China and North Korea (280° and 350°), located across the road in the southern part of the base; and an 8-element circular Adcock HF DF system located where the 7-element array now stands.[166] (Plate 78)

The station was expanded considerably in the early 1990s. By November 1993, it had some 20 antenna systems. Construction of a 20-metre diameter Satcom radome was completed on 6 August 1991. Two more HF doublets and a new HF 'beam antenna' were added, as well as two new rotatable VHF log periodic antennas, pointing towards 346° and 226° (North Korea and Taiwan),

[166] Sato, 'Intelligence Collection Bases in Japan'.

and two new fixed log-periodic antennas, pointing towards 266° and 338° (Shanghai and North Korea).[167] (Plate 79)

Many of these antenna systems were removed during the later 1990s. By February 2002, the two HF rhombic antennas, the HF 'beam antenna' and the eight HF doublets had gone. The two 26-element Model 527B horizontal HF LPAs had been replaced by two new curtain LPAs, one identified as a 23-element Model 527B horizontal HF LPA and the other as a 25-element TCI Model 503 vertical HF LPA. There were still five VHF LPAs, as well as the 8-element Adcock HF DF system.[168] (Plate 80)

The 8-element circular Adcock HF DF array was still operational in July 2003. A sign at the HF DF site identified it as belonging to the 'GSDF Ogori Duty Unit', and said that a buried cable led to the main Communications Station. It was still there in imagery dated 21 April 2006. However, it had been replaced by the new large circular 7-element array in imagery dated 16 May 2008. The new array is clearest in high-resolution GoogleEarth imagery dated 19 August 2010. (Plates 81 and 82)

The second radome was installed in mid-2002. A JDA spokesperson informed local residents when construction started that the radome would be about 25 metres in diameter, mounted on a 3-metre high foundation.[169] Photographs taken in July 2002 show the preparatory construction at the site, including the pedestal for the radome and two adjacent 2-storey buildings, one of which is linked to the radome pedestal by a covered passage-way, located south of the main base, where the two HF Model 527B curtain antennas and the Model 503 LPAs had previously been situated. Photographs taken in July 2003 show the completed green-coloured radome and adjacent buildings at the southern site, as well as a new Model 524-type horizontal HF LPA located in the

[167] 「大刀洗通信所」、酒見辰正（著者）、福岡県平和委員会, 1993.11.18, [Sakemi Tatsumasa, "The Tachiarai Communications Station!", Fukuoka Prefecture Peace Committee, 18 November 1993].
[168] 「大刀洗通信所大。。！」、酒見辰正（著者）、福岡県平和委員会, [Sakemi Tatsumasa, "Big .. at the Tachiarai Communications Station!", Fukuoka Prefecture Peace Committee, February 2002].
[169] Correspondence from Sakemi Tatsumasa, 1 May 2008.

northern part of the main base (and oriented towards North Korea), where one of the rhombic antennas had previously been located.[170] (Plates 83, 84 and 85)

The third Satcom radome was installed in 2003-04. Photographs on the Web taken in July 2004 show that it is identical to the second radome, and connected by passage-way to the same large building as that radome.[171] (Plate 86)

The fourth radome, with a diameter of 24 metres, was constructed in 2005-06. It was noted by a local resident who visited the station on 7 March 2006.[172] It is located in the northern sector of the base, near where the HF doublets had been in the 1980s and 1990s. Although it is dark-coloured, it is clearly visible in GoogleEarth imagery of the area dated 21 April 2006. (Plate 87 shows GoogleEarth imagery dated 10 August 2010)

In March 2008, the MoD acquired land on the western side of the southern part of the site, and construction of further facilities was reported by local residents.[173] The fifth radome was subsequently constructed in this area. It was completed by February 2010, and is slightly smaller than the previous two radomes in the southern sector. High-resolution GoogleEarth imagery dated 19 August 2010 showed that a foundation had been completed for a sixth radome, located at the southern-most point in the southern sector. It had been completed by October 2012, and is slightly larger than the fifth radome. (Plate 88)

Five new small (7.5-metre diameter) radomes were constructed in the southern sector in 2012-13. GoogleEarth imagery dated 22 July 2012 shows the five identical foundations, about seven metres in diameter, on the western side of the second and third radomes. Terraserver imagery dated 20 November 2012 shows the dish pedestals being installed in the foundations and materials for the radomes themselves laid out nearby. (Plate 89 is a photograph taken in December 2013)

---

[170] 'Questions from Sato Yuji and Answers from Sakemi Tatsumasa re Tachiarai Changes Since 2002', 21 July 2003.
[171] Masahiro Narita, at http://naritaworks.hp.infoseek.co.jp/works/images/jgsdf_tachiarai.jpg; and「太刀洗通信所」、『福岡県の軍事基地』、福岡県平和委員会、酒見辰正（著者）, [Sakemi Tatsumasa, 'Tatiarai Communications Station', Fukuoka Prefecture Military Bases, Fukuoka Peace Committee], at http://www.peace-fuk.net/tatiarai/tatiarai.htm.
[172] Correspondence from Sakemi Tatsumasa, 1 May 2008.
[173] Correspondence from Sakemi Tatsumasa, 28 April 2008.

GoogleEarth imagery dated 18 October 2014 shows further changes since December 2013. The first radome, installed in the middle of the northern sector in 1991, has been removed, although its foundation was still in place. A fifth large radome has been installed in the southern sector, between the fifth and sixth radomes (counting from the first in 1991); it is about 25 metres in diameter. (Plate 90).

An engineer from NSA HQ at Fort Meade visited Tachiarai for 'partner training' from 22 to 26 April 2013.[174] This visit occurred when the five new radomes would have been achieving an initial operational capability, and could have been connected to that project.

[174] 'Semiannual Report of Payments Accepted from a Non-Federal Source: National Security Agency', at http://cryptome.org/2014/07/nsa-fy13-semiannual-report.pdf.

Plate 76

Six radomes at DIH SIGINT station, Tachiarai,

(2 in Northern sector and 4 in Southern sector),

22 July 2012

Plate 77

Six large radomes (2 in N sector and 4 in S sector),

DIH SIGINT station, Tachiarai,

8 December 2013

Plate 78

DIH SIGINT station, Tachiarai,

23 July 1987

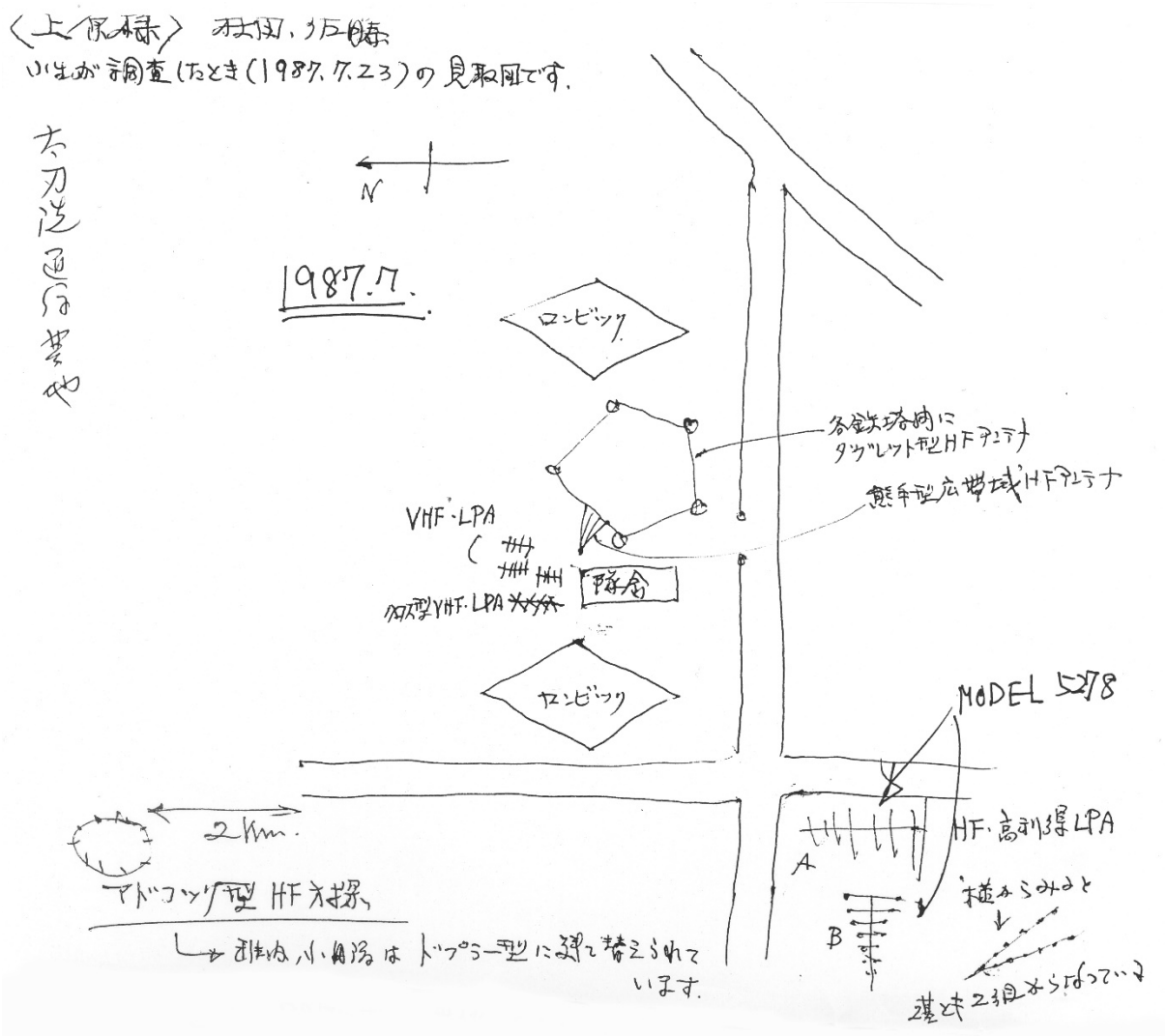


Plate 79

DIH SIGINT station, Tachiarai,

November 1993

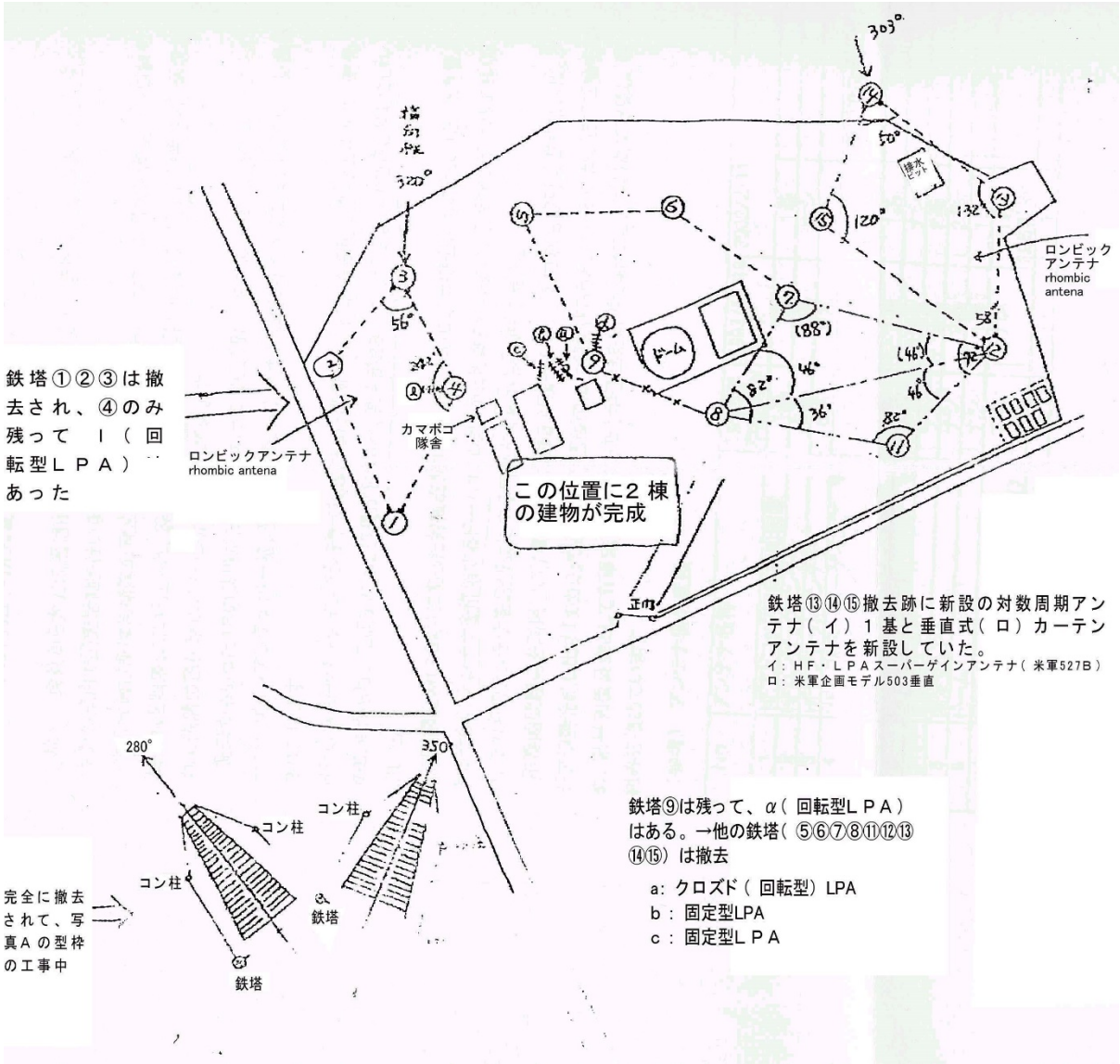


Plate 80

DIH SIGINT station, Tachiarai,

July 2002

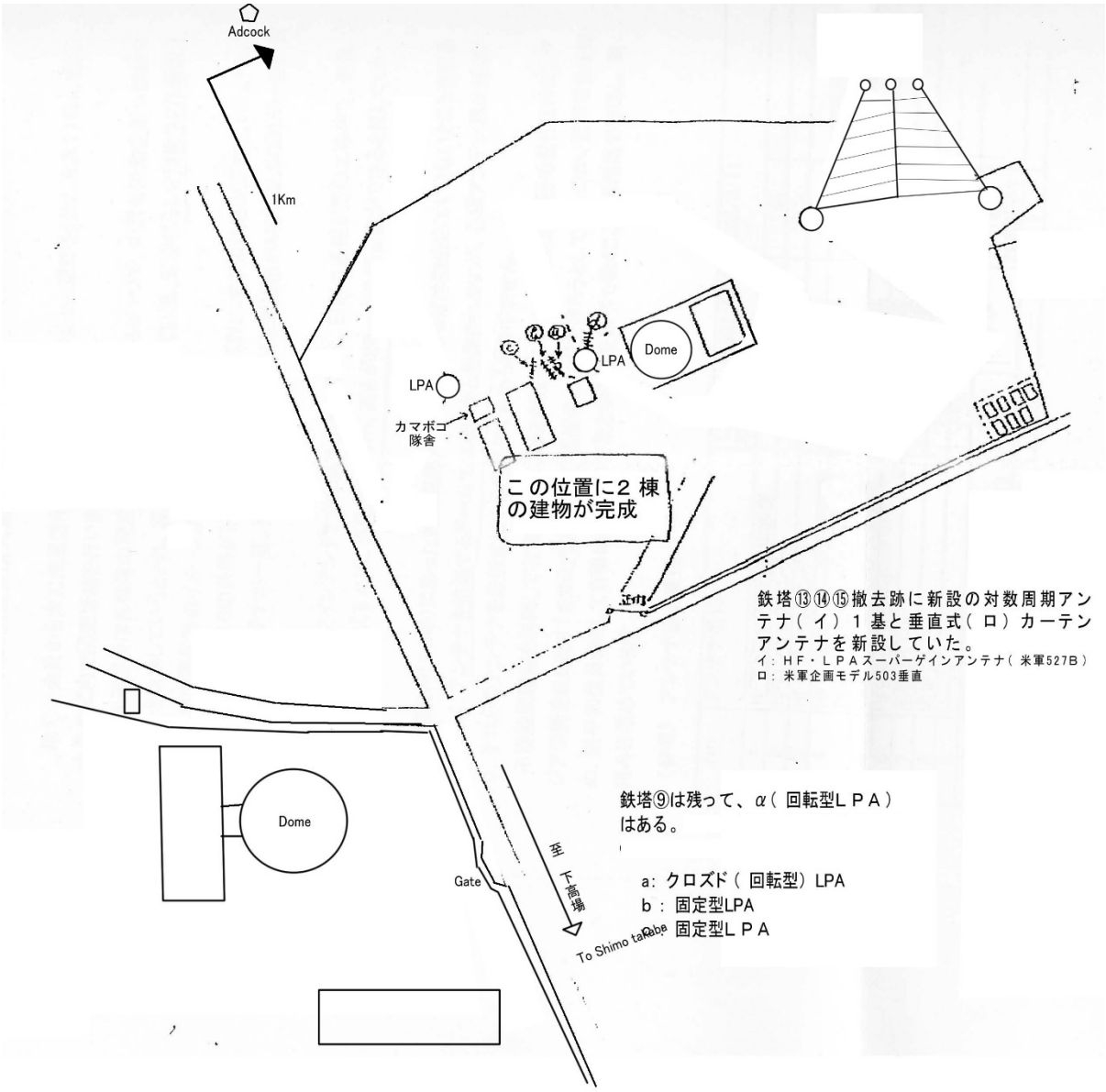


Plate 81

New 7-element CDAA,

DIH SIGINT station, Tachiarai,

12 October 2012

Plate 82

7-element HF/VHF DF facility,

DIH SIGINT station, Tachiarai,

15 February 2010

Plate 83

Model 524 Super High Gain HF LPA,

DIH SIGINT station, Tachiarai,

February 2002

Plate 84

Model 524 HF LPA,

DIH SIGINT station, Tachiarai,

8 December 2013

Plate 85

Two radomes and Model 524 HF LPA,

DIH SIGINT station, Tachiarai,

July 2003

Plate 86

Three radomes, DIH SIGINT station, Tachiarai,

July 2004

Source: Sakemi Tatsumasa, Fukuoka Prefecture Peace Committee

Plate 87

Northern sector,

DIH SIGINT station, Tachiarai,

GoogleEarth imagery,

19 August 2010

Plate 88

Four large radomes in the Southern sector,

DIH SIGINT station, Tachiarai,

8 December 2013

Plate 89

Five new 7.5-metre radomes in the Southern sector,

DIH SIGINT station, Tachiarai,

8 December 2013

Plate 90

DIH SIGINT station, Tachiarai,

(with one large radome in the Northern sector and five large radomes in the southern sector), GoogleEarth imagery, 18 October 2014

Chapter 13
Kikai-jima

Kikai-jima is a small island at the northern end of the Ryukyu island chain, but administratively in Kagoshima Prefecture, with a population of only 9,300. Located at 28° 20′ N and 130° 0′ E, it is part of the Amami-Oshima Island group, and is about the closest point in Japan to the central part of the eastern side of China. Shanghai and Hangzhou are about 850 km away. It measures about 12 km long and about four km across its girth. Its highest point, Hyakunodai Park, is only 212 metres high; it was the site of a radar facility during the Second World War. The island is quite isolated; economically, it is one of the poorest parts of Japan. Most of the people are engaged in sugar-cane farming, including production of the 'Kurochu' liquor made from sugar-cane; others grow melons and mangoes; some are involved in fishing or the small tourist industry based on the island's beautiful coral lagoons; some make the famous 'tsumugi' silk. The locals are strong environmentalists. There had been a fairly unobtrusive SIGINT station on the island for 25 years, seemingly without attracting much attention, but in the late 1980s, when the JDA proposed construction of a new large CDAA, the plan encountered fierce opposition from the locals.

The Kikai-jima Communications Station is now Japan's most important SIGINT station for intercepting Chinese HF and VHF radio communications. It was established in 1962, its main task being to monitor the communications within the Chinese armed forces, and to locate and identify the sources of radio transmissions, and hence to continuously monitor the location and movement of Chinese units.[175] It has also monitored North Korean communications, most famously in December 2001 when it intercepted the radio communications of a North Korean 'spy boat' sunk by the Japan Coast Guard (JCG) in international waters west of Amami-Oshima.[176]

---

[175] *Tokyo Shimbun*, 12 August 1998, in American Embassy, Tokyo, 'Daily Summary of Japanese Press', 26 August 1998.
[176]『喜界島「象のオリ」問題、これまでの経緯』、Ohguchi Bak（著者), [Ohguchi Bak, 'The Kikaijima "Elephant Cage" Problem: the story to date'], at http://www.synapse.ne.jp/bak/kikai/elephant/history.html.

The original station was located just southeast of Akaren, in the southern part of the island. It consisted of a 2-storey operations building, an administration building, and a 5-storey barracks building. The original antenna field was situated on the southern side of the operations building, where it had always been surrounded by sugar cane fields. For more than 40 years, the primary antenna system was a HF curtain-type system, strung across four 40-metre high masts. In 1988, there was also a HF doublet antenna strung between another two 40-metre high poles, a HF monopole, and two VHF antennas.[177] The station was maintained by about 50 personnel from the JGSDF, JMSDF and JASDF as well as civilian employees of the JDA in 1998.[178] (Plate 91)

An Adcock HF DF system, with eight tall poles, was located about 350 metres south of the HQ. According to local residents in 2001, the system had been installed at least 10 years before that, and probably a lot earlier.[179] Called a 'mini-elephant cage' by some of the locals interested in the facility, it was similar to the 7-metre 8-element HF DF system that was at Kobunato in the 1980s and early 1990s and formerly also at Ooi and Tachiarai. (Plate 92)

A new large CDAA became operational in March 2006 in the Kawamine area, about two km southeast of the HQ and barracks.[180] It is a unique design, evidently taking advantage of the interminable planning delays to incorporate the most advanced technology in a fairly environmentally-friendly structure. The antenna system, clearly shown in GoogleEarth imagery, consists of eleven tall HF masts in an outer ring with a diameter of about 150 metres, and eleven shorter VHF poles in an inner ring about 100 metres in diameter, with a building in the centre; the mat is about 190 metres in diameter. It sits on a built-up circular base which is about 15 metres high.

---

177 「情報収集基地について」、佐藤裕二（著）、『'88 年日本平和大会：第 6 分科会「なくそう！核戦争用 C3I」資料』1988 年 11 月 19 日, Sato Yuji, 'Intelligence Collection Bases in Japan', Materials for Section 6, 'Close C^3I for Nuclear Use', Japan Peace Committee Conference, 19 November 1988)].

178 *Tokyo Shimbun*, 12 August 1998, in American Embassy, Tokyo, 'Daily Summary of Japanese Press', 26 August 1998.

179 Private correspondence, 13 February 2001.

180 「喜界島「象のオリ」運用へ　防衛庁の通信傍受施設", 共同通信, ['Kikaijima "Elephant Cage" Defense Agency communications interception facility operational', Kyodo], 47News, Japan Press Network, 15 March 2006, at http://www.47news.jp/CN/200603/CN2006031501004268.html.

The installation of a large CDAA system at Kikai-jima had been planned since the early or mid-1980s. It was initially supposed to be similar to the CDAAs at Miho, which became operational in 1977, and Chitose, constructed in 1987, and to function in close cooperation with them, albeit focused on China rather than North Korea and the then Soviet Union.[181]

The requirement for a large CDAA in the area between Kyushu and Okinawa was approved in the Mid Term Defense Plan (MTDP) adopted in September 1985, which had been developed over the previous couple of years under the impetus of Prime Minister Nakasone. It projected funding for the 1986-90 period, and highlighted the need for defence of Japan's maritime approaches out to 1,000 nautical miles. In November 1985, the *Asahi Shimbun* reported that Kikai-jima was the 'leading candidate' for the site of the proposed station.[182] It was reported in April 1986 that the planned 'improvement' of the Kikai-jima station 'is intended to eliminate a dead angle in [the] zone of surveillance that has hampered radio trigonometry procedures' between the Miho, Chitose and Kikai-jima stations, and thence allow the JDA 'to pinpoint the source of wireless transmissions in the Sea of Okhotsk in the north-east and off the Vietnam coast in the south-west'.[183]

The JDA had initially wanted to build the new CDAA in the Akaren area, closer to the HQ and barracks, but the local residents had resisted the scheme. In December 1986, the town council voted unanimously against the proposal to 'modernize the communications centre's facilities'.[184] A Committee to Protect Farmland was formed in January 1987 to organise public opposition to the

---

[181] *Tokyo Shimbun*, 12 August 1998.
[182] 「喜界島が最有力、OTH レーダー基地 防衛庁構想」、朝日新聞、1985 年 11 月 08 日, ['Defence Agency concept: Kikaijima Leading Candidate for OTH Radar Base', *Asahi Shimbun*, 8 November 1985], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/851108_asahi.html.
[183] Robert Y. Horiguchi, 'US Backpedals on Japan's Defences', *Pacific Defence Reporter,* April 1986, p. 25.
[184] 「象のオリ" 反対請願を一転採択　住民の意思」野村町長　喜界町議会で全会一致」南海日日新聞　1986 年 12 月 24 日, ['Town Council Unanimously Adopts Petition Against Kikai Elephant Cage', *Nankai Daily*, 24 December 1986], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/861224_nankai.html.

proposal; it campaigned at both the town council and prefectural assembly levels.[185]

By 1991, when the JDA began pressing for a resolution of the issue, the opponents remained unmoved. In August 1991, the chairman of the Committee to Protect Farmland said that they were 'determined to stop construction' of the CDAA.[186] In November 1991, the Committee organised a protest meeting at which opponents claimed the new system would threaten the safety of the islanders and degrade the natural environment.[187]

By 1997, the JDA was determined to proceed with construction of the CDAA somewhere on the island. 830 million yen was included in the FY 1997 budget for the project, and some contracts were apparently signed, but there was still fierce opposition from local residents and most of the budgeted funds went unspent. However, residents in the Kawamine area came out in favour of the station on condition that the JDA provided certain financial subsidies and provision of a water supply for the island.[188]

By the end of March 1998, the JDA had acquired more than half of the 30 hectares needed for the new site. In April, a spokesman for the Fukuoka Defense Facilities Administration Bureau stated that the new antenna system would have an 80-metre radius, that about 180 land-owners were involved in the land acquisition process, and that construction was expected to begin soon.[189]

---

185 「地主が "守る会" 組織　"象のオリ" 建設反対で」南海日日新聞　1987 年 01 月 09 日, ['Landowners form "defence association" in opposition to construction of "elephant cage"', *Nankai Daily*, 9 January 1987], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/870109_nankai.html; and 「７万人署名へ運動 地区労が方針決める」、南海日日新聞、1987 年 01 月 09 日, ['70,000 sign petition; District labour council policy decision', *Nankai Daily*, 9 January 1987, at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/870109-2_nankai.html.

186 『「象のオリ」川嶺地区が動く』、南海日日新聞、1991 年 08 月 08 日, ['Kawamine district "elephant cage" movement', *Nankai Daily*, 8 August 1991], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/910808_nankai.html.

187 「"象のオリ" 阻止を、川嶺集落内をデモ行進、喜界」南海日日新聞　1991 年 11 月 10 日, ['Kikaijima: Stop the "elephant cage"; demo march in Kawamine village', *Nankai Daily*, 10 November 1991, at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/911110_nankai.html.

188 「象のオリ用地 8 割買収契約 喜界島」、南海日日新聞、1998 年 07 月 03 日, ['Elephant Cage, 80 per cent of Land Purchased', *Nankai Daily*, 3 July 1998], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/980703_minami.html.

189 「『象のオリ」反対派住民、求む「支援の声」、地権者もり立てに活用』南海日日新聞 1998 年 04 月 24 日, ['Residents oppose "elephant cage": seek supporting voices; landowners

By the end of June, 25 hectares, or 80 per cent of the required land had been acquired.[190] It was reported in August that the JDA expected to begin construction at the new site in February 1999, that geological surveys of the site would begin soon, and that more than 100 SDF personnel would work at the station when the CDAA became operational.[191] In September 1998, funds were added to the FY 1998 defence budget for both construction of an access road to the site and initial surveying of the island's water resources.[192]

However, one of the land-owners announced in May 1998 that he opposed the proposed facility, and as at August two land-owners were still adamantly refusing to give up their land.[193] Sugar cane was planted on the land, and mini-plots were leased out to other opponents.[194] Further protest meetings were organised, one in October 1998 attended by about 70 people, and another in April 1999 attended by about 200 people.[195]

In September 1999, the JDA requested 100 million yen for the FY 2000 defence budget for construction of the new facility.[196] In September 2000 it

---

rally around', *Asahi Shimbun*, 24 April 1998, at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/980703_minami.html.

[190] 'Elephant Cage, 80 per cent of Land Purchased'.

[191] *Tokyo Shimbun*, 12 August 1998, in American Embassy, Tokyo, 'Daily Summary of Japanese Press', 26 August 1998; and 「象のオリ建設予定地で地質調査始まる」、南海日日新聞、1998 年 08 月 22 日, ['Geological Survey to Begin at Elephant Cage Construction Site', *Nankai Daily*, 22 August 1998], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/980822_nankai.html.

[192] *Ibid*; and 「喜界島象のオリ関連予算 8000 万円を要求」、南海日日新聞、1998 年 09 月 02 日, ['Elephant Cage-Related Budget Request for 80 Million Yen', *Nankai Daily*, 2 September 1998], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/980822_nankai.html.

[193] 'Land-owner Supports the Opposition', 4 May 1998, at http://www.synapse.ne.jp/~bak/kikai/elephant/reffernce.html; and *Tokyo Shimbun*, 12 August 1998, in American Embassy, Tokyo, 'Daily Summary of Japanese Press', 26 August 1998.

[194]「喜界島『象のオリ』、建設予定地で反対派サトウキビ植え付け」、朝日新聞 1998 年 09 月 13 日, ['Kikaijima "Elephant Cage": Opposition Planting Sugar Cane at Construction Site', *Asahi Shimbun*, 13 September 1998], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/980913_asahi.html.

[195]「『象のオリ」建設阻止へ出身者らが奄美を守る会」、南日本新聞、1998 年 10 月 12 日, ['Blocking Construction: Locals Meet to Protect Amami, Stop "Elephant Cage"', *Minami Nippon Shimbun*, 22 October 1998], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/981022_minami.html; and 「奄美の自然と平和を守る郡民会議、総決起集会」、南海日日新聞、1999 年 04 月 16 日, [District People Pally to Protect Amami's peace and nature', *Nankai Daily*, 16 April 1999], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/990416_nankai.html.

[196]「防衛庁、『象のオリ』概算要求で 1 億円」、南海日日新聞、1999 年 09 月 02 日, ['Defence Agency Requests 100 Million Yen for Elephant Cage', *Nankai Daily*, 2 September 1999], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/990902_nankai.html.

requested another 78 million yen.[197] However, there was no progress at the site. Protest meetings were held in October 1999, attended by about 200 people, and in October 2000, as part of International Anti-War Day 'pep rallies'.[198] Sugar cane was planted in September every year and harvested the following March.[199] The last harvesting was in March 2005, but it was by then largely symbolic. In 2004, the JDA began clearing the new site, and construction of the CDAA began around mid-year, leaving only small areas outside the circular base for cane growing.[200] It was reported in March 2005 that the JDA expected the facility to be operational by the end of the year.[201]

A major contractor was Koden Electronics Company, which produces a wide range of DF systems, covering the spectrum from MF, HF, VHF and UHF. It built the 36-element CDAAs at Kobunato, Wakkanai and Higashi Nemuro in 1988-92. Koden was awarded a contract for 1,449,000 yen in December 2005 for 'inspection and maintenance' of the 'ground radio-wave measurement system' at Kikai.[202]

The official opening ceremony at the CDAA site was held on 15 March 2006. JDA officials said that the station would have an initial operational capability (IOC) at the end of March, and that it would be fully completed by the end of FY 2008 (i.e., early 2009).[203] (Plate 93) According to a report in April

---

197 「喜界島象のオリ、防衛庁が７８００万円を概算要求」、南海日日新聞、2000 年 09 月 02 日, ['Defence Agency Budget Request for 78 Million Yen for Elephant Cage', *Nankai Daily*, 2 September 2000], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/000902_nankai.html.

198「国際反戦デー奄美地区総決起集会」、南海日日新聞、1999 年 10 月 21 日, ['Amami Regional International Anti-War Day Pep Rally', *Nankai Daily*, 21 October 1999], http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/991021_nankai.html; and 「国際反戦デー奄美地区総決起集会」、南海日日新聞、2000 年 10 月 21 日, ['Amami Regional International Anti-War Day Pep Rally', *Nankai Daily*, 21 October 2000], at http://www.synapse.ne.jp/~bak/kikai/elephant/history.html.

199「予定地内の畑でサトウキビ収穫作業」、南海日日新聞　2001 年 03 月 19 日, ['Harvesting Sugar Cane at the Planned Site', *Nankai Daily*, 19 March 2001, at http://www.synapse.ne.jp/~bak/kikai/elephant/reffernce.html.

200 'Last Harvesting at Elephant Cage Site', *Minami Nihon Shimbun*, 27 March 2005, at http://www.373news.com/2000picup/2005/03/picup_20050327_1.htm.

201 *Ibid*.

202 随意契約一覧表、平成 17 年度 12 月期、海上自衛隊佐世保地方総監部, ['Table of Contracts, December 2005', MSDF Sasebo Region Headquarters], at http://www.mod.go.jp/msdf/bukei/s0/nyuusatsu/200512.pdf.

203 'The Elephant Cage Opening Ceremony', 15 March 2006, at http://d.hatena.ne.jp/pahoo/20060315; ['Kikaijima "Elephant Cage" Defense Agency communications interception facility operational'.

2010, two six-person teams, one concerned with maritime surveillance and the other with airspace surveillance, provide a continuous watch on relevant Chinese frequencies.[204]

GoogleEarth imagery dated 12 October 2006 showed that construction of the CDAA and an operations building on its southeastern side had been completed at the Kawamine site, while large expanses had been cleared and leveled for further construction both north and south of the operations building. (Plate 94) At the same time, it showed the original station at Akaren, with its operations building, administration building, barracks building and HF antenna farm still intact, and two new barracks buildings in the northern part of the base. By around 2008, the administration building and two maintenance and logistic support buildings had been completed at Kawamine. The operations building, administration building and antenna farm at Akaren had been dismantled. The original barracks at Akaren had also been dismantled, but it had been replaced by a third new 5-storey barracks building by 2012. (Plates 95, 96, 97 and 98 show photographs of the CDAA taken in October 2012 and December 2013)

DigitalGlobe imagery dated 23 June 2011 shows that the operations building had been considerably expanded in the previous few years. By October 2012, new antenna systems had been installed on the roof of the operations building. These included two very large horizontal HF/VHF log-periodic systems, a large vertical HF/VHF LPA, and about a dozen VHF masts. One of the horizontal HF/VHF LPAs is pointed towards the northwest, towards China's Jiangsu and Zhejiang Provinces, while the other is pointed towards the southwest, towards the Senkaku Islands and China's Fujian Province. (Plate 99)

More than 200 personnel worked at the Kawamine station in December 2013, a significant increase over an estimate of about 150 personnel in October 2012. The three barracks buildings at Akaren provide dormitory accommodation for around 200. (Plate 100) In addition, a 2-storey dormitory building was constructed at the northeastern part of the Kawamine site in 2010-12; it is able to accommodate another 20 or so personnel.

---

[204] 'Japan Electronic Warfare Group: Intelligence Officers Take Turns Monitoring China', *China Daily*, 21 April 2010, at http://www.china-daily.org/Mil-News/Japan-Electronic-Warfare-Group-6-Chinese-intelligence-officer-in-turn-monitor/.

The unit celebrated its 50th anniversary with a large ceremony on 8 November 2012.

Kikai-jima and the December 2001 North Korean 'spy boat' incident

The SIGINT station at Kikai-jima played important roles in the North Korean 'spy boat' incident in December 2001, when a North Korean spy ship was sunk, with the loss of all 15 crewmen, in quite complicated and controversial legal circumstances.[205]

The station was at that time equipped with the old HF curtain-type array, three VHF antennas, and the 8-element HF DF array. It was able not only to provide the JMSDF and the Japan Coast Guard (formerly the Maritime Safety Agency) with the approximate location and heading of the ship, but also provided the JDA/DIH with important details concerning the boat's radio contacts and its missions.

In early December, the US informed the JDA that US reconnaissance satellites had seen three 'suspicious boats' departing North Korea's Nampo port and heading towards Japan, and that US intercepts of radio communications from the boats indicated they were involved in clandestine activities. On 18 December, the Kikai-jima station intercepted communications from one of the boats southwest of Kyushu. On 21 December, a JMSDF P-3C *Orion* found the boat within Japan's EEZ (but well outside its territorial waters) about 250 km northwest of Amami-Oshima, or about 300 km from Kikai-jima. On 22 December, the Japanese defence forces and Japan Coast Guard (JCG) scrambled 25 patrol vessels and 14 aircraft to interdict the boat, and after repeated orders to stop were ignored, began to strafe it with machine-gun and rocket fire. The boat fled into China's EEZ, east of Shanghai, and sank abruptly on the night of 22 December, about 390 km northwest of Amami-Oshima.[206] Shortly before 10.13 p.m., when the crew apparently blew up the boat rather than face capture, it

[205] Desmond Ball, 'Intelligence Collection Operations and EEZs: The Implications of New Technology', *Marine Policy*, Vol. 28, 2004, p. 76.
[206] 'Special Press Summary: North Korean Spy Boat Incursion', *Virtual Information Centre*, 28 December 2001, at http://www.vic-info.org/regionshop.nsf/65354f99849a34e08a2568390005del16/942249be31a03f190a256b30007d612d/$FILE/Special+Press+Summary+-+North+Korean+Spy+Boat+Incursion+-+28+Dec+2001+web.doc.

transmitted in Morse code its final message: 'Long live the Generalissimo. Long live the Generalissimo'.[207] North Korean spokesmen denied that the ship was North Korean, and said: 'Japan's overt act of war in waters outside its territory speaks of its extreme ambition of rearmament and foreign expansion'.[208]

The Kikai-jima station was mentioned in numerous Japanese press reports about the incident over the next week or so. It was reported variously that the communications intercepted at the station included transmissions from the boat 'on a frequency used by Pyongyang's ruling Workers Party of Korea', that the intercepts indicated that the boat was engaged in a 'sabotage mission', and that it might also 'have been involved in the smuggling of stimulant drugs'.[209] However, Japanese authorities refused to confirm these reports on the grounds that it could compromise Japan's intelligence collection capabilities. As the Chief Cabinet Secretary, Fukuda Yasuo, said at a news conference on 26 December: 'If I clarify that, it would disclose the Defense Agency's intelligence activities and ability to gather information and adversely affect its intelligence activities. I can't talk about that'.[210]

In July 2002, it was reported that JDA 'radio intercept records' suggested that the spy boat had received fuel and supplies from a mother ship east of Shanghai, before entering Japan's EEZ. Again, Fukuda Yasuo was unwilling to confirm the reports, saying that 'it is difficult to confirm whether we have such

---

[207] Hideharu Torii, 'Japan's Secret SIGINT Organizations: Focusing on North Korea', *Popular Communications*, March 2007, p. 8.

[208] 'Mystery Boat Sinking: Tokyo Rejects Pyongyang's "Brutal Piracy" Accusations', *The Japan Times*, 28 December 2001, at http://www.japantimes.co.jp/cgi-bin/getarticle.p15?nn20011228a8.htm.

[209] 'Mysterious Vessel Believed to Have Radioed North Korea', *The Japan Times*, 27 December 2001, at http://www.japantimes.co.jp/cgi-bin/getarticle.p15?np20011227a1.htm; 'Mystery Boat Sinking: Tokyo Rejects Pyongyang's "Brutal Piracy" Accusations', *The Japan Times*, 28 December 2001, at http://www.japantimes.co.jp/cgi-bin/getarticle.p15?nn20011228a8.htm..; and 'Japan Intercepts Radio Messages', *UPI*, 25 December 2001, at http://www.upi.com/print.cfm?StoryID=26122001-085529-8257r.

[210] 'Defense Agency Knew in Advance of Suspicious Ship', *Mainichi Shimbun*, 26 December 2001, at http://mdn.mainichi.co.jp/news/20011226p2a00m0fp007000c.html; and「不審船、破壊工作目的か　北朝鮮と暗号交信」、東京新聞、2001/12/29
'Suspicious ship intent on sabotage? North Korean encrypted communications', Tokyo Shimbun, 27 December 2001, at http://soejima.to/boards/trafics/7.html

intelligence or not', and that any confirmation of intercept reports could be 'a nuisance to intelligence sources'.[211]

The North Korean boat was equipped with numerous radio systems, operating in the HF band for long-range and the VHF and UHF bands for shorter-range communications. Two HF wire antennas were strung between masts at the fore and aft ends of the boat. When the ship was salvaged by the JCG in September 2002, eleven transceivers and two receivers were found aboard, including an ICOM IC-71 VHF (50-54 MHz) transceiver and an ICOM IC-475 UHF (430-440 MHz) transceiver.[212]

A Japanese cell phone was also found aboard the salvaged vessel; it was believed that the phone had been used to contact North Korean agents and drug trafficking groups in Japan, and that the ship must have entered Japanese territorial waters because of the phone's limited range.[213] Four years later, in October 2006, Japanese prosecutors in a drug smuggling case said that the ship had been carrying drugs, and that 'the call logging of the recovered mobile phone showed that phone calls were made from the cell phone to one of three defendants in the case'.[214]

[211] '"Spy Vessel" had Contact with Ship Off Shanghai', *The Japan Times*, 4 July 2002.
[212] Torii, 'Japan's Secret SIGINT Organizations', pp. 8-12.
[213] 'Cell Phone Records May Yield Clues', *Daily Yomiuri*, 6 October 2002, at http://article.wn.com/view/2002/10/06/Cell_phone_records_may_yield_clues/.
[214] Torii, 'Japan's Secret SIGINT Organizations', p. 12.

Plate 91

HF antennas and operations building,

DIH SIGINT station, Akaren, Kikai-jima,

February 2001

Plate 92

8-element Adcock HF DF system,

DIH SIGINT station, Akaren, Kikai-jima,

February 2001

Plate 93

New 11-element CDAA

at DIH SIGINT station, Kawamine, Kikai-jima,

15 March 2006

Plate 94

New 11-element CDAA and operations building under construction at DIH SIGINT station, Kawamine, Kikai-jima, 12 October 2006

Plate 95

11-element CDAA system,

DIH SIGINT station, Kawamine, Kikai-jima,

19 October 2012

Plate 96

11-element CDAA system,

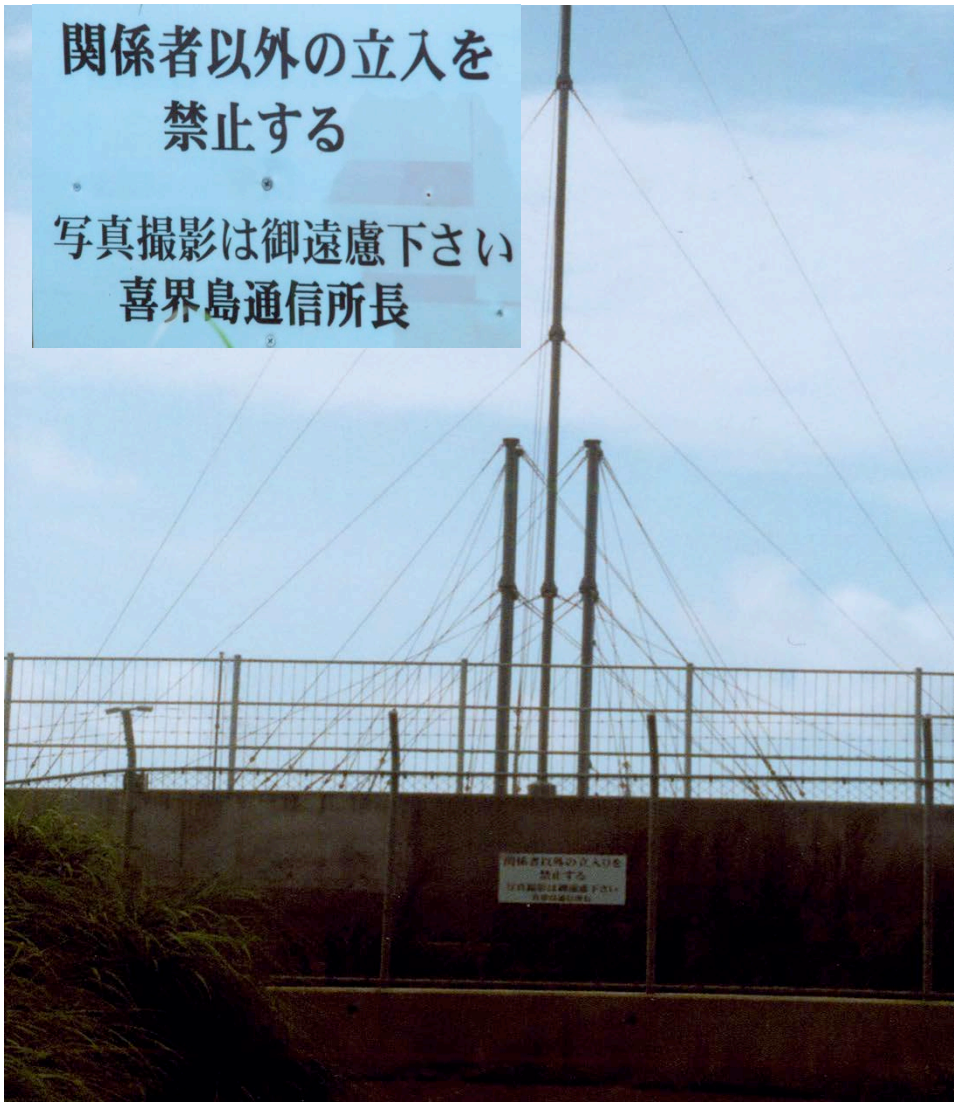
DIH SIGINT station, Kawamine, Kikai-jima,

14 December 2013

Plate 97

New CDAA at DIH SIGINT station, Kawamine, Kikai-jima,

19 October 2012



Note: The sign on the fence (see inset) reads:
'Unauthorised people not permitted to enter.
Please do not take photographs.
Head, Kikaijima Communications Station'.

Plate 98

CDAA antennas, DIH SIGINT station, Kawamine, Kikai-jima,

19 October 2012

Plate 99

Two horizontal and one vertical HF/VHF LPA antennas,

DIH SIGINT station, Kawamine, Kikai-jima,

19 October 2012

Plate 100

Barracks at Akaren, Kikai-jima,

19 October 2012

Chapter 14

JASDF stations at Seburi-yama, Miyako-jima and Fukue-jima

In 2004-14, the JASDF successively constructed three new major SIGINT stations – at Seburi-yama in northern Kyushu, Miyako-jima in the southern part of the Ryukyu island chain, and Fukue-jima, an island in Nagasaki Prefecture, Kyushu. These are equipped with J/FLR-4 and J/FLR-4A SIGINT systems, manufactured by Toshiba, state-of-the-art successors to the AN/FLR-12 system at Wakkanai, the J/FLR-2 system at Nemuro and the J/FLR-3 system at Okushiri in Hokkaido, providing panoramic suites of VHF, UHF and SHF sub-elements.

Seburi-yama

A new ELINT/COMINT station was established by the JASDF in 2004-06 at Seburi-yama near Fukuoka, home of the 43rd Air Control and Warning (AC&W) Group and a J/FPS-3 JADGE radar system. It involves a J/FLR-4 SIGINT system, and is operated by the JASDF's Air Information Collection Unit No. 4. Construction of the new facility began in the spring of 2004 and was mostly completed by around May 2005. It consists of a 'huge building', located on the western side of the mountain, measuring 20 metres high, 70 metres long, and 30 metres wide, and two large towers with the top five metres enclosed in two-tiered electromagnetically-transparent covers. In the case of the larger tower, the diameter of the lower part of the two-tiered cover is about 14.8 metres and that of the top part is about 11.3 metres; in the case of the smaller tower, the diameters of the two tiers are about 10.5 and 9.3 metres. With a collection of HF, VHF and UHF antennas, the station is reportedly concerned with monitoring Chinese and North Korean signals.[215] According to a JDA press release in October 2006, the station was scheduled to become operational in early 2007.[216] (Plates 101, 102 and 103). Plate 104 shows GoogleEarth imagery dated 16 October 2014.

---

[215] 「背振山通信基地群」、『福岡県の軍事基地』、福岡県平和委員会, ['Sefuri Mountain Communications Bases Group', Fukuoka Prefecture Military Bases, Fukuoka Peace Committee], at http://www.peace-fuk.net/sehuri/sefuri.html.

[216] 「宮古島に電波測定施設 航空自衛隊分屯基地」琉球新報　2006 年 10 月 24 日, ['The Radio Measurement System in Miyako-jima, JASDF Sub-base', *Ryukyu Shimpo*, 24 October 2006], at http://ryukyushimpo.jp/news/storyid-18270-storytopic-3.html.

Contracts are regularly awarded by the JASDF to Toshiba for repair and maintenance of the J/FLR-4 system at Seburi-yama since 2005. On 6 June 2005, for example, Toshiba received a contract for 8,295,000 yen for a preliminary survey of the 'regular repair' requirements for a J/FLR-4 system.[217] On 27 October 2005, it was awarded a contract for 44,482,200 yen for the 'regular repair' of a J/FLR-4 system, to be completed by January 2006.[218] On 26 June 2006, it received a contract for 6,669,600 yen for an 'RF Tuner Unit' for the J/FLR-4 'radio-wave measurement system', and a contract for 9,267,300 yen for a preliminary survey of the 'regular repair' requirements for the J/LR-4 system.[219] In September 2006, it received a contract for 105,244,650 yen for the provision of three 'base-band receiver units' for a J/FLR-4 system, as well as a contract for 4,223,250 yen for 'regular repair' of a J/FLR-4 system.[220]

Data collected at the Seburi-yama SIGINT station is processed and analysed by the 2nd Warning Data Processing Unit (until March 2001 called the Warning Data Unit) at the JASDF's base at Kasuga, and then forwarded to the Operational Intelligence Unit at the Air Defense Command HQ at Fuchu.[221]

Miyako-jima

The decision to construct a JASDF ELINT/COMINT collection station on the beautiful island of Miyako-jima was first reported in November 2004. These reports said that a 'communications intelligence team' was to be dispatched to the island, and that the purpose of the station was 'to intercept and handle

[217] 随意契約一覧表、平成 17 年 6 月、航空自衛隊第 3 補給処、埼玉県狭山市, ['Table of Contracts, June 2005', JASDF 3rd Supply Depot, Sayama, Saitama-ken], at http://www.mod.go.jp/asdf/3depotprocure/sonota/zuikei/riyuu/1706.pdf.
[218] 随意契約一覧表、平成 17 年 10 月、航空自衛隊第 3 補給処、埼玉県狭山市, ['Table of Contracts, October 2005', JASDF 3rd Supply Depot, Sayama, Saitama-ken'], at http://www.mod.go.jp/asdf/3depotprocure/sonota/zuikei/riyuu/1710.pdf.
[219] 随意契約一覧表、平成 18 年 6 月、航空自衛隊第 3 補給処、埼玉県狭山市, ['Table of Contracts, June 2006', JASDF 3rd Supply Depot, Sayama, Saitama-ken'], at http://www.dii.jda.go.jp/asdf/3depotprocure/sonota/zuikei/riyuu/1806.pdf.
[220] 随意契約一覧表、平成 18 年 9 月、航空自衛隊第 3 補給処、埼玉県狭山市, ['Table of Contracts, September 2006', JASDF 3rd Supply Depot, Sayama, Saitama-ken'], at http://www.mod.go.jp/asdf/3dep/sonota/zuikei/riyuu/1809.pdf.
[221] 'Radio-wave Measurement Facility at Miyako-jima: Chinese Military Intelligence-gathering', *Okinawa Times*, 24 October 2006. See also 「航空自衛隊春日基地」, ['Kasuga Air Base JASDF'], at http://www.mod.go.jp/asdf/kasuga/.

communication signals of Chinese warships and aircraft'.[222] The same reports said that the JDA 'believes that a station on Miyako Island is not enough, and another one must be added at a southwest island to intercept and decode the rival's radio communications signals'.[223] About 100 million yen was included in the FY 2005 defence budget for 'system design expenses' relating to the Miyako-jima station.[224]

Construction of the station at Miyako-jima began on 23 October 2006.[225] A large area had been cleared and levelled by February 2007, and construction of the new barracks building was underway.[226] It is officially called a Land Radio Wave Measurement Facility, and is located in Nobaru village in the Ueno area. The *Yomiuri Shimbun* reported on 24 October that the new station would collect both ELINT and COMINT concerning Chinese air activities, and that data would be used to develop electronic counter-measures (ECM). It said that:

> The facility is expected to collect electronic information such as radar signals and radio transmissions. It will analyse the data to enhance its understanding of the behaviour and capabilities of other countries' aircraft. The government will also use the accumulated data to help it draw up effective measures to prevent other countries from using radar and other electronic devices.[227]

A JASDF official said: 'All around Japan we need to know what is happening and be ready to catch the information'.[228]

The 2006 defence budget contained 2.4 billion yen for 'building new base facilities, barracks and equipment' at Miyako-jima. The prime contract was awarded to Toshiba in Tokyo for J/FLR-4A 'terrestrial radio wave measurement

---

[222] 'Japan Intends to Set Up Intelligence Station at East China Sea', *People's Daily Online*, 9 November 2004, at http://english.peopledaily.com.cn/200411/09/eng20041109_163229.html.
[223] *Ibid*.
[224] 'Radio-wave Measurement Facility at Miyako-jima'.
[225] *Ibid*.
[226] Frank Odell, 'Miyako Jima: Base Update', *623rd-Det. 1, AC&W Squadron*, at http://www.geocities.com/fodellus/91miyako-01.html.
[227] 'Info Gathering Boost Eyed for East China Sea', *Yomiuri Shimbun*, 24 October 2006, at http://newsonjapan.com/cgi-bin/news/link.cgi?ID=40203. See also 'Japan to Deploy New Radar to Monitor Chinese Activity', *International Herald Tribune*, 23 October 2006, at http://www.iht.com/articles/ap/2006/10/23/asia/AS_GEN_Japan_China_Radar.php.
[228] 'Miyako to Host New Surveillance Station', *JapanUpdate.com*, 26 October 2006, at http://www.japanupdate.com/?id=7174.

equipment'.[229] Another 2.5 billion yen for the J/FLR-4A 'ground radio-wave measurement system' at Miyako-jima was also included in the 2007 defence budget.[230]

The JASDF station at Miyako-jima stretches along a ridge, 108.6 metres altitude at its highest point, running from northwest (where the J/FPS-2 JADGE radar is located) to southeast, roughly parallel to R 201 (between R 78 at the northern end and R 246 along the southern side), in the southern part of the island. The J/FLR-4A facility is located at the southeastern end, directly up the hill from the main entrance to the base. Construction of the new four-storey airmen's barracks was completed in April 2008, at which time the old barracks near the top of the hill at the southeastern end were demolished.[231] By April 2008, construction of the massive 12-storey J/FLR-4A main operations building was well underway, with its length running NW-SE, in front of the old barracks. By January 2009, construction of this building was nearing completion, with flanking extensions facing north and south added, covering the previous site of the old barracks. Two large two-tiered antenna-bearing towers, southeast of the main building, connected by a roofed walkway, were also nearing completion. (Plates 105 and 106)

The J/FLR-4A system at Miyako-jima is slightly different to the J/FLR-4 system at Seburi-yama. In the case of the larger tower, the diameter of the lower part of the two-tiered cover is about 17.5 metres and that of the top part is about 10 metres; in the case of the smaller tower, the diameters of the two tiers are about 14 and 12 metres. They are closer in size to the J/FLR system at Wakkanai, rather than to that at Seburi-yama. (A new antenna structure has also been built nearer the northern end of the complex, just south of the J/FPS-2 radome). There are two 5.5-metre diameter radomes on top of the operations building. The

[229] 「18 重要防衛対策」、朝雲新聞、2006 年 3 月 9 日, ['18 Important Defence Measures', *Asagumo News*, 9 March 2006], at http://www.asagumo-news.com/news/200603/060309/06030904.html; and 'Miyako to Host New Surveillance Station', *JapanUpdate.com*, 26 October 2006, at http://www.japanupdate.com/?id=7174.
[230] 'Radio-wave Measurement Facility at Miyako-jima'; and 「電子音響の契約希望者募集要項」装備本部　防衛施設庁、2007 年度, ['Guidelines for Applicants for Electroacoustic Equipment in Fiscal Year 2007', at http://www.epo.jda.go.jp/supply/kouji/kouzi-dai53go.pdf.
[231] Odell, 'Miyako Jima: Base Update'.

station was scheduled to become operational in 2009-10.[232] (Plates 107, 108 and 109)

In February 2008, the Ministry of Defense announced that it was tendering for components for a second phase of the J/FLR-4A system for installation at Miyako-jima. The components were to be delivered to the No. 4 Collection Unit's premises at Kasuga by 26 February 2010, for subsequent delivery to Miyako-jima.[233] In January 2009, the Ministry requested bids for components for Part 3 of the J/FLR-4A system at Miyako-jima, to be delivered to the new base by 26 February 2010.[234]

On 14 March 2011, the Ministry of Defense, on behalf of the JASDF, announced contract notices for eight J/FLR-4A components, including a Direction Finder Processing Unit.[235]

Data collected at Miyako-jima is transmitted to Kasuga for processing and analysis, and then forwarded to the Air Defense Command at Fuchu.[236]

Fukue-jima

The JASDF also decided in 2006-07 to establish a SIGINT station on Fukue-jima, off the northwest side of Kyushu, 1,050 km southwest of Tokyo. It had initially considered three candidate sites, comprising Shimokoshiki-jima and Okino Erabu-jima as well as Fukue-jima.[237] On 4 November 2006, the JDA

---

[232]「宮古島に電波測定施設 航空自衛隊分屯基地」、琉球新報、2006 年 10 月 24 日
, 'The Radio Measurement System in Miyako-jima, JASDF Sub-base', *Ryukyu Shimpo*, 24 October 2006」, at http://ryukyushimpo.jp/news/storyid-18270-storytopic-3.html.

[233] 'Open Tender for Ground Radio-wave Measurement System J/FLR-4A (Miyako-jima No. 2)', 1 February 2008, at http://www.epco.mod.go.jp/kokok/11-481/announcement20080125210841.pdf; and

[234] 'Official Announcement No. 400: Public Bid for Ground Radio-wave Measurement System J/FLR-4A (Miyako-jima), Part 3', 22 January 2009, at http:announcement20090109221000.pdf; and 地上電波測定装置 J/FLR-4A (宮古島) (その 3) 用初度部品 1 式、案件公示日 2009/09/15 、入札情報サービス NJSS, ['Ground radio wave measuring device J / FLR-4A (Miyakojima) (Part 3), initial parts 1 set, Project announcement date: 15 September 2009', NJSS Tender Information Service, at http://www.njss.info/offers/view/206892/.

[235] 公示第 49 号、 平成 23 年 314 日、 変更公示, 分任支出負担行為担当官、 航空自衛隊第 3 補給処, [Notice of change, Public Notice No. 49, 14 March 2011, JASDF 3rd Supply Depot], item 4114, at
http://www.mod.go.jp/asdf/3dep/koubooyobikikakukyousou/kouji_pdf/230314kouji49.pdf.

[236] 'Radio-wave Measurement Facility at Miyako-jima: Chinese Military Intelligence gathering', *Okinawa Times*, 24 October 2006.

[237] 'The Ground Radio-wave Measurement System in Nagasaki, Response to Military Threat of China', *Sankei Shimbun*, 7 March 2007, at

announced that the selection had been narrowed to two sites, Fukue-jima and Shimokoshiki.[238] It announced the decision to proceed with the Fukue-jima site on 6 March 2007. The *Sankei Shimbun* reported that it was another 'electromagnetic surveillance facility to monitor Chinese military activity'.[239] In January 2009, a Chinese report said that construction of the new listening station at Fukue-jima began in August 2007, and that in December 2008 the Ministry of Defense decided to 'comprehensively upgrade' the new station.[240]

The Chinese report also said that 'the intelligence listening station in Miyako-jima and the one in Fukue-jima, working in coordination with each other, are able to help the JSDF to monitor the movement of the PLA in the whole East Sea and the Taiwan Strait', and that 'Japan will rely on the two large intelligence listening stations to focus on the movement of the PLA's vessels and aircraft coming down to the East Sea from the Bohai Sea and Yellow Sea'.[241]

The Chinese reports about construction at the Fukue-jima base were somewhat premature. Initial site preparations, including the removal of one of the J/FPS-3 JADGE radomes, only occurred in 2009-2010. Construction of a new barracks building (initially to house the J/FLR-4A engineers and builders) and preparation of the specific sites for the J/FLR-4A towers and operations building took another two years. By October 2012, construction of the J/FLR-4A elements had just begun. In December 2013, construction of the operations building and towers was well underway, but it looked like it was still another year away from completion. (Plates 110 and 111) The Ministry of Defense stated in its fiscal year

---

http://www.sankei.co.jp/seiji/seisaku/070307/ssk070307000.htm; and 'Japan Increases Surveillance of China', *Taipei Times*, 8 March 2007, at http://www.taipeitimes.com/News/world/archives/2007/03/08/2003351427.

[238] 'East China Sea Radio-wave Detection Increase: Collection of Chinese Information Strengthened', *Sankei Shimbun*, 5 November 2006, at http://sankei.co.jp/news/041105/morning/05iti001.htm.

[239] 'The Ground Radio-wave Measurement System in Nagasaki, Response to Military Threat of China', *Sankei Shimbun*, 7 March 2007, at http://www.sankei.co.jp/seiji/seisaku/070307/ssk070307000.htm; and 'Japan Increases Surveillance of China'.

[240] 「日媒及专家极力渲染中国潜艇、战机威胁」、作者 耀龙、国防时报数字报刊、2009 年 1 月 10, [Yao Long, 'Japanese media and experts greatly exaggerated the Chinese submarine, fighter threat', *National Defence Journal*, 10 January 2009], at http://gfsb.newssc.org/html/2009-01/10/content_399901.htm.

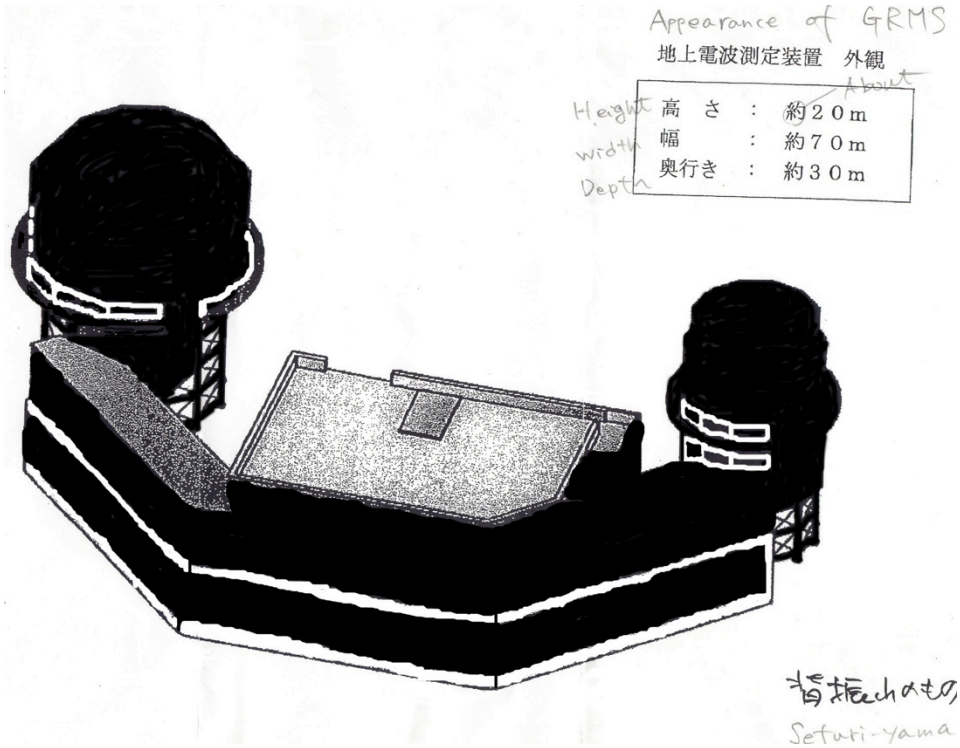
[241] *Ibid*.

2012 procurement plan that the facility was due to open by April 2014.[242] It was more likely to be around December 2014 (see Plate 112).

[242] 平成 24 年度調達予定品目（中央調達)『電子音響課』, ['FY 2012 Procurement Plan Items (Central Procurement). Electronics and Acoustics'), Equipment Procurement and Construction Office, Ministry of Defense], at http://www.epco.mod.go.jp/supply/jisseki/choutatuyotei_dennon.pdf.

Plate 101

J/FLR-4 SIGINT system, JASDF JADGE station at Seburi-yama, official diagram, 2004



Source: Sakemi Tatsemasa, Fukuoka Prefecture Peace Committee

Plate 102

J/FLR-4 SIGINT system, JASDF JADGE station,

Seburi-yama,

8 October 2010

Plate 103

J/FLR-4 SIGINT system,

JASDF JADGE station,

Seburi-yama,

8 October 2010

Plate 104

J/FLR-4 SIGINT system

(with J/FPS-3 JADGE radome in foreground),

JASDF JADGE station,

Seburi-yama,

GoogleEarth imagery, 16 October 2014

Plate 105

J/FLR-4A SIGINT towers, Miyako-jima,

29 January 2009

Plate 106

J/FLR-4A towers and cross-walk at Miyako-jima,

29 January 2009

Plate 107

J/FLR-4A SIGINT system, Miyako-jima,

GoogleEarth imagery, 6 March 2010

Plate 108

J/FLR-4A SIGINT system, Miyako-jima,

December 2010

Plate 109

J/FLR-4A SIGINT system, Miyako-jima,

29 November 2010

Source: 「福江島にスパイアンテナ装置建設へ」、
Peace Papers, 長崎平和委員会、2010 年 11 月 30 日」
['Construction of spy antenna facility on Fukuejima', *Peace Papers*,
Nagasaki Peace Committee, 30 November 2010],
at http://www7b.biglobe.ne.jp/~chi-tan/news/news101130.html

Plate 110

J/FLR-4A SIGINT system under construction (with JADGE aeronautical antenna behind and tropospheric antenna on right), JASDF JADGE station, Fukue-jima, 10 December 2013

Plate 111

J/FLR-4 SIGINT system under construction, JASDF JADGE station, Fukue-jima, 10 December 2013

Plate 112

J/FLR-4A SIGINT system under construction (with JADGE aeronautical antenna behind and tropospheric antenna on right), JASDF JADGE station, Fukue-jima, 22 December 2014

Source: 福江島スパイ・レーダーは「戦争する国づくり」と一体
五島・三井楽基地調査＆現地学習会
長崎平和委員会、(2014 年 12 月 22 日),
['Fukue Island spy radar is integrated into "nation-building for war"',
Goto-Miiraku Base Research and Local Study Association,
Nagasaki Peace Committee, 22 December 2014],
at http://www7b.biglobe.ne.jp/~chi-tan/news/news141222.html

Chapter 15

Yonaguni Island

At the beginning of July 2009, it was reported that the JGSDF's Western Army planned to establish a Coastal Surveillance Unit and associated radar facility on Yonaguni Island, the western-most point of Japan, part of the Sakeshima Island group; it is about 110 km from the east coast of Taiwan, and about 170 km southwest of the disputed Senkaku Islands. Its purpose was to monitor the movement of vessels in the area, and, more specifically, to 'clarify the intentions' of Chinese naval deployments in the area. The planned unit consisted of 300 personnel, drawn from the augmented 1st Combined Brigade based in Naha, Okinawa, and was to have been deployed at Yonaguni by the end of 2014; the plan was confirmed in the Mid-Term Defense Build-up Plan for FY 2010-2014, then being formulated for approval by the Cabinet later in 2009.[243] The Defence Minister, Hamada Yasukazu visited Yonaguni on 8 July, the first time a defence chief had ever visited the island. He said in Yonaguni that: 'I am well aware of the need for defence of the Sakeshima island chain and I plan to consider the matter [of establishing a JGSDF Coastal Surveillance Unit] in the future'.[244]

Although many of the island's 1,600 residents were opposed to the JGSDF presence, it was initially welcomed by a majority. Indeed, the mayor of Yonaguni, Hokama Shukichi, had visited Defence Minister Hamada in Tokyo on 30 June and requested a JGSDF presence on the island 'to provide defence for the offshore islands, assistance during natural disasters, and help promote the local economy'.[245] In August 2009, the mayor was re-elected against an opponent who was opposed to the JGSDF plan.[246]

---

[243] 'The GSDF Deployment to Yonaguni: Making Border Defence Explicit', *Sankei News*, 5 July 2009, at http://sankei.jp.msn.com/politics/policy/090705/plc0907050128000-n1.htm; 'Japan May Deploy Troops Near Disputed Islands', *The China Post*, 3 July 2009, at http://www.chinapost.com.tw/asia/japan/2009/07/03/214750/Japan-may.htm; and Hisashi Ishimatsu, 'Far Western Isle a Defence Outpost?', *Asahi Shimbun*, 10 July 2009, at http://www.asahi.com/english/Herald-asahi/TKY200907100075.html.
[244] Ishimatsu, 'Far Western Isle a Defence Outpost?'.
[245] *Ibid*; 'Japan Beefs Up Defense Forces in Yonaguni', *The View from Taiwan*, 6 July 2009, at http://michaelturton.blogspot.com/2009/07/japan-beefs-up-defense-forces-in.html; and

However, the reports about the plan raised concerns in both China and Taiwan. Chinese 'experts' reportedly insisted that China has sovereignty over the Senkaku islands and that Japan did not appreciate China's security interests; they said that a military presence on Yonaguni could provoke an 'inappropriate chain reaction', and that Japan 'should think twice' about the issue.[247] In Taipei, it was argued that 'Taiwan shields Yonaguni from China', and hence that the planned move was 'aimed at Taiwan rather than China'.[248] Indeed, the Secretary General of Taiwan's National Security Council (NSC) told the Director of the American Institute Taiwan (AIT) that 'Taiwan was curious about the motivation behind' the proposal. In his view, 'there was little military rationale behind such a deployment,… unless Tokyo intended to monitor activities on and off of Taiwan's east coast'. He said that 'any JDF activities' on Yonaguni Island were 'a sensitive subject on Taiwan'.[249]

In September 2009, following the election of the Democratic Party government, the new Defense Minister, Kitazawa Toshimi, said that he was 'cautious' about the Yonaguni proposal. He said that 'from the viewpoint of national defense, sending troops to Yonaguni is basically important', but that 'I doubt whether the matter requires urgency'. He said that it was important 'not to raise security concerns among neighbouring countries', and that 'the plan would be reassessed'.[250]

In July 2010, however, 'senior' MoD officials said the Ministry was still considering the plan, and that it 'envisioned' that 'the coastal monitoring unit to be sent to Yonaguni Island' would 'be modeled' on the JGSDF's No. 301 Coastal

---

'Yonaguni Asks Self Defense Forces for Troop Deployment', *Weekly Japan Update*, 9 July 2009, at http://two--plus--two.blogspot.com/2009/07/yonaguni-asks-self-defense-forces-for.html.

[246] 'Pro-JGSDF Mayor Wins Reelection', *Weekly Japan Update*, 6 August 2009, at http://two--plus--two.blogspot.com/2009/08/pro-jsdf-mayor-wins-reelection.html.

[247] 'Chinese Experts Say the Japanese Military Deployment is Close to Sensitive Areas of China', *China Military Report*, 4 July 2009, at http://wuxinghongqi.blogspot.com/2009/07/chinese-experts-said-deployment-of.html.

[248] Lai I-chung, 'Yonaguni Plans Raise Questions of Taiwan', *Taipei Times*, 6 July 2009, at http://www.taipeitimes.com/News/editorials/archives/2009/07/06/2003447948.

[249] Director of the American Institute Taiwan (AIT), Taipei, 'Taiwan NSC: What is the JDF Doing on Yonaguni?', 27 September 2009, at http://wikileaks.org/cable/2009/09/09TAIPEI1169.html.

[250] 'Defense Minister Cautious About Deploying GSDF on Westernmost Island', *Kyodo*, 25 September 2009, at http://www.breitbart.com/article.php?id=D9AU3VE80&show_article=1; and 'Japan to Reassess Plan to Deploy Troops on Yonaguni', *NHK News*, 26 September 2009, at http://www.nhk.or.jp/news/t10015700241000.html#.

Surveillance Unit at Wakkanai and the No. 302 Coastal Surveillance Unit at Shibetsu/Nemuro.[251]

On 11 November 2010, Defense Minister Kitazawa Toshimi announced that the Government had decided to proceed with the proposal, and that 100 troops would initially be stationed on the island to conduct 'surveillance of Chinese naval vessels'. He said that the Defence Ministry had requested that 30 million yen (about US$365,000) be included in the FY 2011 budget for 'preparatory research', including site selection. Reports stated that the Ministry planned to eventually deploy some 200 personnel to the station.[252]

The Defence Ministry's Mid-Term Defense Program (FY2011-FY2015), approved by the Cabinet on 17 December 2010, officially endorsed the project. It stated that:

> The GSDF will establish a new coastal surveillance unit, and will begin to form a first-response unit to station in the island areas of southwestern Japan, to gather intelligence, monitor situations, and respond swiftly when incidents occur.[253]

In July 2011, MoD officials gave a presentation to Yonaguni residents concerning the scale, general purpose and construction schedule for the project, as well as the site selection process which was then nearing finalisation. The residents were still sharply divided.[254] Mayor Hokama Shukichi said in early 2011 that he hoped the new garrison would bring 'an influx of badly needed jobs and youthful residents, especially if the soldiers come with their families'. Opponents feared that the soldiers would bring 'noise and crime'. They also feared that the project would harm ties between the island and Taiwan. Mayor Hokama said that he 'used to be a socialist who opposed the Self-Defense Force's

---

[251] 'Beefed-up Okinawa Border Eyed', *The Japan Times*, 20 July 2010, at http://www.japantimes.co.jp/text/nn20100720a5.html; and 'Editorial: Why Try to Rock the Boat?', *The China Post*, 29 July 2010, at http://www.chinapost.com.tw/editorial/world-issues/2010/07/29/266563/Why-try.htm.

[252] 'Japan May Place Troops Close to Disputed Islands', *Taipei Times*, 10 November 2010, at http://www.taipeitimes.com/News/front/archives/2010/11/10/2003488154; 'Japan to Send Troops to Remote Isle Over China Fears', *AFP*, 11 November 2010, at http://newsinfo.inquirer.net/inquirerheadlines/regions/view/20101112-302830/Japan-to-send-troops-to-remote-isle-over-China-fears.

[253] Mid-Term Defense Program (FY2011- FY2015), (approved by the Security Council and the Cabinet on December 17, 2010), at http://www.mod.go.jp/e/d_act/d_policy/pdf/mid_termFY2011-15.pdf.

[254] James Simpson, 'As Plans for Coastal Monitoring Unit Proceed, Yonaguni Residents Raise Voices', *Japan Security* Watch, 22 August 2011, at http://jsw.newpacificinstitute.org/?p=7801#comments.

very existence', but that he 'became a base proponent after Chinese ships began appearing in nearby waters a decade or so ago'.[255]

On 21 August 2011, *Mainichi Shimbun* reported that the Ministry of Defense had selected 15-20 hectares of a 125-hectare farm in the southwest part of the island, then being used for grazing about 60 cows and horses. It was municipal land belonging to Yonaguni Town. It was reported that initial procurement funds were included in the FY 2012 budget, that the project comprised a SIGINT facility, optical equipment and a radar system, together with the Unit HQ and barracks, as well as a heliport, and that it was scheduled for completion within four years.[256] On 23 August, Defense Minister Kitazawa confirmed at a press conference that 30 million yen was being spent on 'research' on the Yonaguni station in the FY 2011 budget, that initial construction costs would be included in the FY 2012 budget, and that the Defense Ministry intended 'to complete the deployment of the coastal monitoring unit by the end of FY 2015'.[257]

On 20 September 2011, 556 people, or more than a third of the island's total population and about 46 per cent of eligible voters, signed a petition to the mayor opposing the project. A survey in early September found that those opposed had reached 73.3 per cent.[258] In early October, however, the Defence Ministry announced that it had requested 1.6 billion yen in the FY 2012 budget to proceed with construction of the station. This included funds to purchase the land from the Yonaguni Town Office and to 'pay compensation to those affected'. The Chief-of-Staff of the JGSDF, Kimizuka Eiji, said that: 'As the GSDF, we have to upgrade our monitoring functions (in the southern seas) to the same levels as those in Hokkaido'. Mayor Hokama said that: 'There are no other ways to

[255] Martin Fackler, 'Japanese Isle in Sea of Contention Weighs Fist Versus Open Hand', *New York Times*, 10 February 2011, at http://www.nytimes.com/2011/02/11/world/asia/11island.html?_r=0

[256] 'Gov't Eyes Obtaining Land on Southwestern Isle for Coastal Monitoring', *Mainichi Shimbun*, 21 August 2011; 'Japan Mulls Coastal Monitoring Unit in Wake of China's Naval Activity', *Kyodo News*, 21 August 2011, at http://www.accessmylibrary.com/article-1G1-264916415/japan-mulls-coastal-monitoring.html; and James Simpson, 'As Plans for Coastal Monitoring Unit Proceed, Yonaguni Residents Raise Voices', *Japan Security* Watch, 22 August 2011, at http://jsw.newpacificinstitute.org/?p=7801#comments.

[257] 'Press Conference by the Defense Minister', Ministry of Defense, Tokyo, 23 August 2011, at http://www.mod.go.jp/e/pressconf/2011/08/110823.html.

[258] Gavan McCormack, 'Yonaguni: Dilemmas of a Frontier Island in the East China Sea', *The Asia-Pacific Journal*, September 2012, at http://japanfocus.org/-Gavan-McCormack/3837#.

revitalize our island'.[259] On 18 November 2011, the MoD provided a briefing for Yonaguni residents in which it explained its plans and 'the reasons behind choosing Yonaguni'.[260]

The Ministry of Defence's annual report for 2012 included a map of Yonaguni showing a requirement for two separate sites on the island (Plates 113 and 114). First, the main, larger site, required for barracks and operational facilities, was identified as part of South Farm, in Kubura District, in the southwest part of the island. Second, additional operational facilities were required at Inbidake Western Outskirts, a much higher site just south of the centre of the island.[261]

In September 2012, the MoD requested 6.2 billion yen for the Yonaguni Coastal Defence facility in its budget request for FY 2013. This included 'the price of facilities and monitoring equipment', as well as 'site preparation works'.[262] The budget statement and pursuant media commentary indicated that the planned station will comprise four systems – (i) a 7-element CDAA for HF DF purposes, like the one installed for No. 301 Coastal Surveillance Unit at Wakkanai in 2009-10; (ii) VHF/UHF monitoring equipment such as that operated by No. 301 Coastal Surveillance Unit at Maruyama and at Rebun Island (and depicted in the MoD's budget statements); (iii) a SOSUS-type undersea surveillance system connected to the shore station; and (iv) a cylindrical, truck-mounted J/TPS-102 mobile radar system.

Planning was again interrupted when, on 20 March 2013, Mayor Hokama unexpectedly presented the MoD with a demand for 1 billion yen as a 'nuisance payment' to compensate local land-owners, in addition to an annual rent of 15 million yen. The MoD responded a week later, with a spokesman stating that: 'The MoD will continue to negotiate positively with the islanders, but if we do not see any progress, we will have no choice but to review the plan, including

[259] Kim Soonhi, 'Islanders Split as Ministry Seeks 1.5 Billion Yen to Deploy SDF', *Asahi Shimbun*, 3 October 2011, at http://ajw.asahi.com/article/behind_news/politics/AJ2011100313047.
[260] 'Japan to Deploy Forces Near Tiaoytais', *The China Post*, 19 November 2011, at http://www.chinapost.com.tw/taiwan/foreign-affairs/2011/11/19/323408/Japan-to.htm
[261] Ministry of Defense, *Defense of Japan 2012*, (Ministry of Defense, Tokyo, 2012), p. 164.
[262]「我が国の防衛と予算, 平成 25 年度概算要求の概要」(Defense Programs and Budget of Japan, Overview of FY 2013 Budget Request), 防衛省（Ministry of Defense), September 2012, p.5, at http://www.mod.go.jp/j/yosan/2013/gaisan.pdf; and James Simpson, 'Key Figures from the MoD FY2013 Budget Request', *Japan Security Watch*, 7 September 2012, at http://jsw.newpacificinstitute.org/?p=10480.

whether to deploy the troops on the island'.[263] Press reports said that alternative sites, including Miyako-jima and Ishigaki Island, were being considered.[264] However, on 20 June the Yonaguni Assembly formally adopted a resolution withdrawing the demand for the 'nuisance payment' and agreeing to the annual rent of 15 million yen for the lease of 'about 214,000 square metres of land'. On 27 June, the MoD and the Assembly signed a contract to this effect, with completion of the station still scheduled for the end of FY 2015.[265]

Construction of the new facility began with a ground-breaking ceremony on 19 April 2014. The ceremony was attended by the Minister of Defence, Onodera Itsunori, who said that it was 'a part of our effort to strengthen the surveillance over the southwestern region' and that: 'We are staunchly determined to protect Yonaguni Island, a part of the precious Japanese territory'. Some Yonaguni residents opposed to the new station scuffled with MoD officials at the ceremony. Officials reiterated that the unit would become operational in March 2016.[266]

On 22 February 2015, the Town Assembly held a referendum on the issue, in which about 60 per cent of the voters voted in support of the station. There were 1,276 eligible voters, including 97 minors in high school and five permanent foreign residents, of whom 1,094 voted, a turn-out of 85.74 per cent. 632 voted in favour of the deployment and 445 were opposed. Mayor Hokama said that he was 'relieved by the results'. The new Defence Minister, Nakatani Gen, said that the project would have proceeded 'as scheduled even if a majority

---

[263] Paul Kallender-Umezu, 'Japan-China Island Spat Threatens GSDF Deployment and Much More', *Defense News*, 1 May 2013, at http://archive.defensenews.com/article/20130501/DEFREG03/305020013/Japan-China-Island-Spat-Threatens-GSDF-Deployment-Much-More.

[264] 'Japan to Give Up Yonaguni Garrison Only 150 km Away from Diaoyu Islands', *Sankei Shimbun*, 20 March 2013.

[265] Shannon Tiezzi, 'Japan to station troops on Yonaguni, near disputed Islands', The Diplomat, 19 Aril 2014, at http://thediplomat.com/2014/04/japan-to-station-troops-on-yonaguni-near-disputed-islands/;'SDF Will Build a New Military Base Only 150 km Away from the Diaoyu Islands', *Best News*, 21 June 2013, at http://www.best-news.us/news-4707397-SDF-will-build-a-new-military-base-is-only-150-km-away-from-the-Diaoyu-Islands.html; and 'Japanese Self-Defense Forces Will be Stationed at Diaoyu Islands to Monitor China', *Best News*, 29 June 2013, at http://www.best-news.us/news-4773774-Japanese-Self-Defense-Forces-will-be-stationed-at-Diaoyu-islands-nearest-to-monitor-China.html.

[266] Nobuhiro Kubo, 'Japan to Arm Remote Western Island, Risking More China Tension', *Reuters*, 18 April 2014, at http://www.reuters.com/article/2014/04/18/us-japan-military-islands-idUSBREA3H05M20140418; and 'Local Anger at Japan Island Surveillance Unit', *Aljazeera*, 20 April 2014, at http://www.aljazeera.com/news/asia-pacific/2014/04/local-anger-at-japan-island-surveillance-unit-201442044145528401.html.

of voters [had opposed it]'. He said that: 'The project is moving ahead on proper procedures. The government has already budgeted the necessary funds for it'. [267]

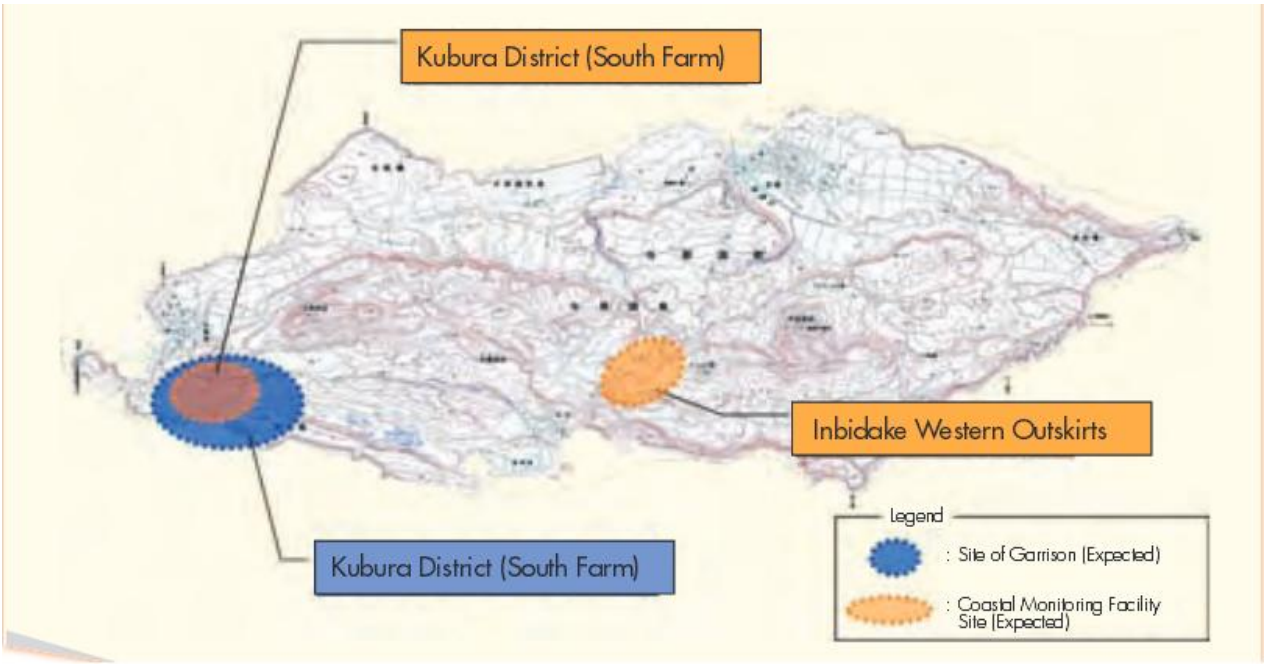
At the same time the Defense Ministry released details of the planned construction on the farm land acquired at Minami Bokujo on the southern side of the island, costing 8.7 billion yen. The three main buildings and receiving station are to cover more than 8,000 square meters, and house 150 personnel. In future a monitoring station and antenna masts are to be built in both Kubara and Sonai, as well as a radar station at Kubara and a communications facility at Sonai. Opposition groups are planning to seek an injunction on construction of the radar station because of the possibility of harmful electromagnetic radiation.[268]

[267]Masakazu Matsushita and Yoichi Shiraishi, 'GSDF Deployment Divides Westernmost Yonagunijima', *Yomiuri Shimbun*, 16 February 2015, at http://defence.pk/threads/gsdf-deployment-divides-westernmost-yonagunijima.359671/; 'Yonaguni Votes in Favor of GSDF Deployment on Island', *The Yomiuri Shimbun*, 23 February 2015; and Mina Pollmann, 'Japan; Troop Deployment Near Taiwan Clears Major Hurdle', *The Diplomat*, 25 February 2015, at http://thediplomat.com/2015/02/japan-troop-deployment-near-taiwan-clears-major-hurdle/.

[268] 「３件で総額 87 億円余　陸自沿岸監視部隊 今後、レーダー基地も」、八重山毎日、2015 年 02 月 26 日, ['Three buildings to costs a further 8.7 bn yen; and a future radar station as well as a GSDF Coastal Observation Unit', *Yaeyama Mainichi*, 26 February 2015], at http://www.y-mainichi.co.jp/news/26915/.

Plate 113

Yonaguni

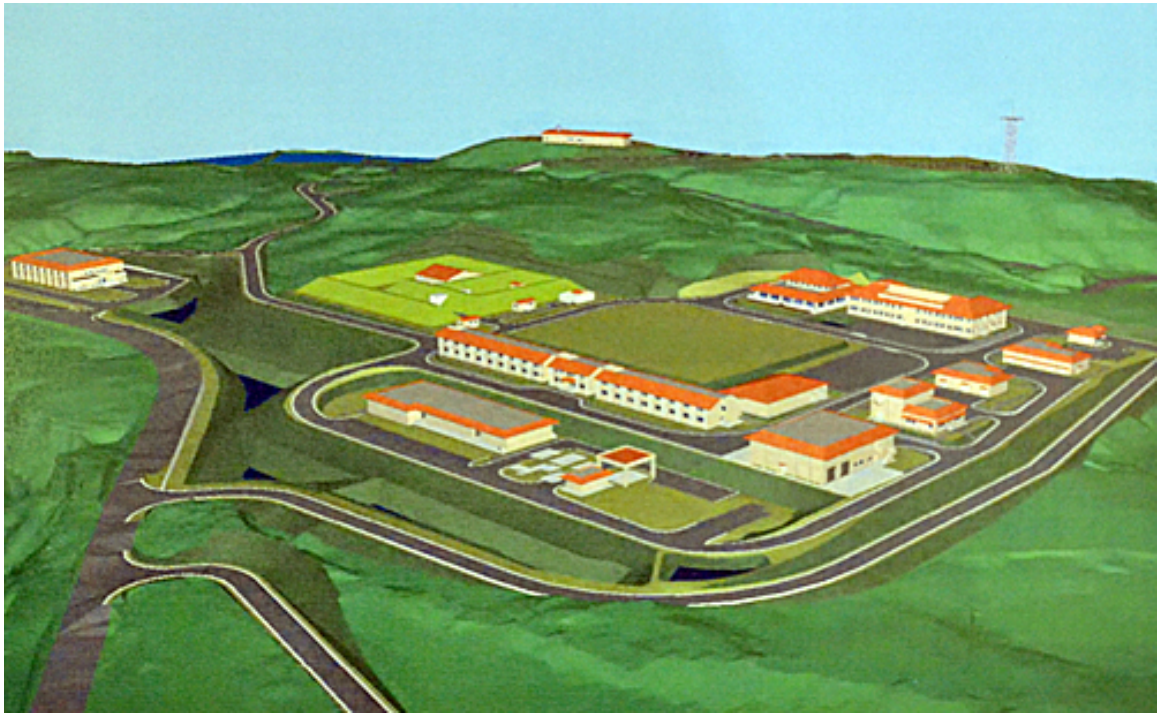


Source: *Defense of Japan 2012*, (Ministry of Defense, Tokyo, 2012), p.143
http://www.mod.go.jp/e/publ/w_paper/pdf/2012/24_Part2_Chapter3_Sec3.pdf

Plate 114

Planned JGSDF garrison construction at

Minami Bokujo, Kubara, Yonaguni



Source: 「３件で総額 87 億円余　陸自沿岸監視部隊 今後、レーダー基地も」、
八重山毎日、2015 年 02 月 26 日,
['Three buildings to cost a further 8.7 bn yen; and a future radar station as well as a GSDF Coastal Observation Unit', *Yaeyama Mainichi*, 26 February 2015],
at http://www.y-mainichi.co.jp/news/26915/.

Chapter 16
Iwoto (Iwo Jima)

It was reported in Tokyo on 19 September 2013 that the Ministry of Defense planned to build a large communications intelligence facility on Iwoto (Iwo Island), in the southeastern part of Japan's second island chain and about 1,250 km south of Tokyo, 'to improve its ability to conduct surveillance on China and its growing military presence'.[269]

Iwo Jima had been the site of considerable SIGINT activity in 1944-45. Japanese Army radio monitoring teams served on the island in 1944 and through the epic battle in February-March 1945, monitoring the radio traffic of carrier-based aircraft operating in the vicinity. The US Marine Corps's 1st Radio Intelligence Platoon accompanied the Marines during the bloody five-week battle. The US Army Air Force's 8th Radio Squadron Mobile (RSM) established a DF Platoon on Iwo Jima soon after it was captured. The US Navy maintained a radio intercept and DF station on the island from April 1945 to December 1945.[270]

Construction of the new DIH facility is expected to cost 12 billion yen, the first tranche of which was included in the FY 2014 defence budget. The facility is scheduled to become operational in FY 2017.[271] At a press conference on 26 September 2013, a Chinese Ministry of National Defense spokesperson in Beijing said that Japan had evidently 'over-reacted' to legitimate Chinese naval and air

[269] 'Surveillance Facility Eyed for Pacific', *The Japan Times*, 19 September 2013, at http://www.japantimes.co.jp/news/2013/09/19/national/surveillance-facility-eyed-for-pacific/.
[270] George W. Garand and Truman R. Strowbridge, *History of U.S. Marine Corps Operations in World War II, Part VI: Iwo Jima*, (Historical Branch, G-3 Division, HQ U.S. Marine Corps, 1971), pp. 451-452, 461; Judy Emerson, '2 Brothers at Iwo Jima, 1 Survived', *Rockford Register Star*, 11 November 2007, at http://iwo-jima-memoirs.tripod.com/marines_iwo_k_w_johnson2.html; 'Japanese Code Intercept Unit WWII: History of 958th', at http://freepages.military.rootsweb.ancestry.com/~braden/; and 'NAVSECGRU Stations Past and Present', at http://www.navycthistory.com/CI_Stations_past_and_present_alphabetical_3a.html.
[271] 'Surveillance Facility Eyed for Pacific'.

training activities in the western Pacific, and that 'the over-reaction demonstrates that [Japan] has a guilty conscience'.[272]

Japan's Defense Minister, Itsunori Onodera, visited the planned construction site on the island on 6 October 2013. He stated that 'it is important to gather information to protect our maritime rights, and a communications monitoring facility is something we must have'; and that: 'Activities of a neighbouring country are intensifying in the Pacific region. We want to make Iwato our base for defending remote islands'.[273]

[272] 'Defense Ministry Spokesman Geng Yansheng's Regular Press Conference on September 26, 2013', Ministry of National Defense, Beijing, 8 October 2013, at http://eng.mod.gov.cn/Press/2013-10/08/content_4472260.htm.
[273] 'Japan's Defense Chief Visits Surveillance Facility Site', *PACNEWS*, 8 October 2013, at http://www.pina.com.fj/?p=pacnews&m=read&o=406469555253210a2564728bbae8bc.

Bibliography

English language materials

Japanese Government sources

Defense of Japan 2012, (Ministry of Defense, Tokyo, 2012).

Mid-Term Defense Program (FY2011- FY2015), (approved by the Security Council and the Cabinet on December 17, 2010), at http://www.mod.go.jp/e/d_act/d_policy/pdf/mid_termFY2011-15.pdf.

'Press Conference by the Defense Minister', Ministry of Defense, Tokyo, 23 August 2011, at http://www.mod.go.jp/e/pressconf/2011/08/110823.html.

U.S. Government sources

'Semiannual Report of Payments Accepted from a Non-Federal Source: National Security Agency', at http://cryptome.org/2014/07/nsa-fy13-semiannual-report.pdf.

Cable from the Secretary of State, Washington, D.C., to the US Embassy, Tokyo, 'Transfer of Equipment at Wakkanai Air Station', 14 August 1973, Public Library of U.S. Diplomacy, Wikileaks, at https://wikileaks.org/plusd/cables/1973STATE160470_b.html.

Cable from the Secretary of State, Washington, D.C., to the US Embassy, Tokyo, 'Munitions Control: Sale of Equipment to JDA', 5 August 1974, Public Library of U.S. Diplomacy, Wikileaks, at http://www.wikileaks.org/plusd/cables/1974STATE169900_b.html.

Cable from US Embassy, Tokyo, to the Secretary of State, Washington, D.C., 'Transfer of Equipment at Wakkanai Air Station', 16 August 1973, Public Library of U.S. Diplomacy, Wikileaks, at https://wikileaks.org/plusd/cables/1973TOKYO10499_b.html.

Cable from US Embassy, Tokyo, to the Secretary of State, Washington, D.C., 'Munitions Control: Sale of Equipment to JDA', 9 August 1974, Public Library of U.S. Diplomacy, Wikileaks, at https://wikileaks.org/plusd/cables/1974TOKYO10382_b.html.

Director of the American Institute Taiwan (AIT), Taipei, 'Taiwan NSC: What is the JDF Doing on Yonaguni?' 27 September 2009, at http://wikileaks.org/cable/2009/09/09TAIPEI1169.html.

United States Army Security Agency*, United States Army Field Station Misawa Historical Report Fiscal Year 1986,*

United States Information Service (USIS), 'Revised Transcript of Soviet Ground Control/Pilot Radio Transmissions', *Backgrounder*, 12 September 1983.

Books and Monographs

Ball, Desmond and Richard Tanter, *The Tools of Owatatsumi: Japan's Ocean Surveillance and Coastal Defence Capabilities*, (Australian National University Press, Canberra, 2015).

Ball, Desmond *Signals Intelligence in the Post-Cold War Era: Developments in the Asia-Pacific Region,* (Institute of Southeast Studies, Singapore, 1993).

Chapman, Josh, *A Special Historical Study of the Organizational Development of the United States Air Force Security Service, 1948-1966*, (Headquarters United States Air Force Security Service, San Antonio, Texas, 1 February 1967).

Dallin, Alexander, *Black Box: KAL 007 and the Superpowers*, (University of California Press, Berkeley, California, 1985).

Ferry, Richard R., *A Special Historical Study of the Organizational Development of United States Air Force Security Service, 1948-1962*, (Headquarters United States Air Force Security Service, Kelly Air Force Base, San Antonio, Texas, 15 February 1963).

Frost, Mike*, Spyworld: Inside the Canadian and American Intelligence Establishments*, (Doubleday Canada, Toronto, 1994).

Garand, George W. and Truman R. Strowbridge, *History of U.S. Marine Corps Operations in World War II, Part VI: Iwo Jima,* (Historical Branch, G-3 Division, HQ U.S. Marine Corps, 1971).

Hersh, Seymour, *The Target Is Destroyed: What Really Happened to Flight 007 and What America Knew About It*, (New York: Random House. 1986).

Johnson, R. W., *Shootdown: The Verdict on KAL 007*, (Chatto & Windus, London, 1986).

Operational History of Japanese Naval Communications, December 1941-August 1945, (Aegean Park Press, Laguna Hills, California, 1985).

Pearson, David E., *KAL 007: The Cover-Up*, (Summit Books, New York, 1987).

Person, Bill, *Critic Makers: The Ironworks Incident*, (Bill Person, 2003),

Pierson, James E., *A Historical Study of the Organizational Development of United States Air Force Security Service, 1970-1974*, (United States Air Force Security Service, San Antonio, Texas, 15 September 1974).

Richelson, Jeffrey T., *Foreign Intelligence Organizations*, (Ballinger, Cambridge, Massachusetts, 1988).

Rohmer, Richard, *Massacre 007: The Story of the Korean Air Lines Disaster*, (Coronet Books, Sevenoaks, Kent, 1984).

Schweizer, Peter, *Friendly Spies: How America's Allies Are Using Economic Espionage to Steal Our Secrets,* (The Atlantic Monthly Press, New York, 1993).

Tart, Larry, *Freedom Through Vigilance: History of U.S. Air Force Security Service (USAFSS). Volume III: USAFSS Ground Sites in Alaska and the Far East*, (Infinity Publishing, West Conshohocken, Pennsylvania, November 2010).

Articles - English language

'Filter Center', *Aviation Week & Space Technology*, 19 December 1983.

'Japan's Sanctuary: The Defense Intelligence Headquarters', *Sentaku*, May 1997, pp. 126-129, (FBIS-EAS-97-150, Northeast Asia, 1 May 1997).

Asian Defence Journal, January 1993, p. 26.

Asian Defence Journal, May 1990, p. 107.

Ball, Desmond, 'Intelligence Collection Operations and EEZs: The Implications of New Technology,' *Marine Policy*, (Vol. 28), 2004.

Ball, Desmond and Euan Graham, 'Japan SIGINT Takes Off', *Jane's Intelligence Review*, (Vol. 12, No. 12), December 2000, pp. 26-31.

Ball, Desmond and Euan Graham, 'Japan's Airborne SIGINT Capabilities', (Working Paper No. 353, Strategic and Defence Studies Centre, Australian National University, Canberra, December 2000).

Ball, Desmond, and Richard Tanter, 'The Transformation of the JASDF's Intelligence and Surveillance Capabilities for Air and Missile Defence', *Security Challenges*, (Vol. 8, No. 3), Spring 2012.

'Japan Expands F-15 Units', *Flight International*, 23 September 1989.

McCormack, Gavan, 'Yonaguni: Dilemmas of a Frontier Island in the East China Sea', *The Asia-Pacific Journal*, September 2012, at http://japanfocus.org/-Gavan-McCormack/3837#.

Nakata H., Y. Akaike, Y. Otsuka, T. Takano, S. Ujigawa and I. Nagashima, 'Ray-tracing Calculation of VHF Radio Waves Scattered by Field-aligned Irregularities Associated with Equatorial Plasma Bubbles', *Transactions of the Institute of Electrical Engineers of Japan*, (Vol. 124, No. 12), 2004, pp. 1253-1254, at http://sciencelinks.jp/j-east/article/200402/000020040204A0013243.php.

Radio Life, (No. 4, 1988).

Simpson, James, 'As Plans for Coastal Monitoring Unit Proceed, Yonaguni Residents Raise Voices', *Japan Security Watch*, 22 August 2011, at http://jsw.newpacificinstitute.org/?p=7801.

Simpson, James, 'Key Figures from the MoD FY2013 Budget Request', *Japan Security Watch,* 7 September 2012, at http://jsw.newpacificinstitute.org/?p=10480.

Torii, Hideharu, 'Japan's Secret SIGINT Organizations: Focusing on North Korea', *Popular Communications*, March 2007.

Toshiaki, Takano and Ujigawa Satoshi, 'Propagation Anomaly of Overseas TV Broadcasting Radio Waves and its Model of Mechanism', *Papers of Technical Meeting on Electromagnetic Compatibility,* Institute of Electrical Engineers of Japan, (Vol. EMC-03, No. 25-30), 2003, pp. 29-34, at http://sciencelinks.jp/j-east/article/200402/000020040204A0013243.php.

Yoneji, Masahiro, Toshiaki Takano, Hiroyuki Nakata and Shin Shimakura, 'Observation of VHF Broadcast Radio Waves Propagating from China', *Proceedings of Asia-Pacific Microwave Conference 2006,* at http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=04429784.

News reports

'"Spy Vessel" had Contact with Ship Off Shanghai', *The Japan Times*, 4 July 2002.

'Beefed-up Okinawa Border Eyed', *Japan Times*, 20 July 2010, at http://www.japantimes.co.jp/text/nn20100720a5.html.

'Cell Phone Records May Yield Clues', *Daily Yomiuri*, 6 October 2002, at http://article.wn.com/view/2002/10/06/Cell_phone_records_may_yield_clues/.

'Chinese Experts Say the Japanese Military Deployment is Close to Sensitive Areas of China', *China Military Report*, 4 July 2009, at http://wuxinghongqi.blogspot.com/2009/07/chinese-experts-said-deployment-of.html.

'Defense Minister Cautious About Deploying GSDF on Westernmost Island', *Kyodo News*, 25 September 2009, at http://www.breitbart.com/article.php?id=D9AU3VE80&show_article=1.

Defense Ministry Spokesman Geng Yansheng's Regular Press Conference on September 26, 2013', Ministry of National Defense, Beijing, 8 October 2013, at http://eng.mod.gov.cn/Press/2013-10/08/content_4472260.htm.

'East China Sea Radio-wave Detection Increase: Collection of Chinese Information Strengthened', *Sankei Shimbun*, 5 November 2006, at http://sankei.co.jp/news/041105/morning/05iti001.htm.

'Editorial: Why Try to Rock the Boat?', *The China Post*, 29 July 2010, at http://www.chinapost.com.tw/editorial/world-issues/2010/07/29/266563/Why-try.htm.

'Habomai Islet Gets Russian Orthodox Church', *Orthodox News*, 18 November 2005, at http://old.orthodoxnews.org/198/Habomai.htm.

'How the U.S. Listened In', *Newsweek*, 12 September 1983.

'Info Gathering Boost Eyed for East China Sea', *Yomiuri Shimbun*, 24 October 2006, at http://newsonjapan.com/cgi-bin/news/link.cgi?ID=40203.

'Japan Beefs Up Defense Forces in Yonaguni', *The View from Taiwan*, 6 July 2009, at http://michaelturton.blogspot.com/2009/07/japan-beefs-up-defense-forces-in.html.

'Japan Electronic Warfare Group: Intelligence Officers Take Turns Monitoring China', *China Daily*, 21 April 2010, at http://www.china-daily.org/Mil-News/Japan-Electronic-Warfare-Group-6-Chinese-intelligence-officer-in-turn-monitor/.

'Japan Increases Surveillance of China', *Taipei Times*, 8 March 2007, at http://www.taipeitimes.com/News/world/archives/2007/03/08/2003351427.

'Japan Intends to Set Up Intelligence Station at East China Sea', *People's Daily Online*, 9 November 2004, at http://english.peopledaily.com.cn/200411/09/eng20041109_163229.html.

'Japan Intercepts Radio Messages', *UPI*, 25 December 2001, at http://www.upi.com/print.cfm?StoryID=26122001-085529-8257r.

'Japan May Deploy Troops Near Disputed Islands', *The China Post*, 3 July 2009, at http://www.chinapost.com.tw/asia/japan/2009/07/03/214750/Japan-may.htm.

'Japan May Place Troops Close to Disputed Islands', *Taipei Times*, 10 November 2010, at http://www.taipeitimes.com/News/front/archives/2010/11/10/2003488154.

'Japan Mulls Coastal Monitoring Unit in Wake of China's Naval Activity', *Kyodo News*, 21 August 2011, at http://www.accessmylibrary.com/article-1G1-264916415/japan-mulls-coastal-monitoring.html.

'Japan to Deploy Forces Near Tiaoytais', *The China Post*, 19 November 2011, at http://www.chinapost.com.tw/taiwan/foreign-affairs/2011/11/19/323408/Japan-to.htm.

'Japan to Deploy New Radar to Monitor Chinese Activity', *International Herald Tribune*, 23 October 2006, at http://www.iht.com/articles/ap/2006/10/23/asia/AS_GEN_Japan_China_Radar.php.

'Japan to Reassess Plan to Deploy Troops on Yonaguni', *NHK News*, 26 September 2009, at http://www.nhk.or.jp/news/t10015700241000.html#.

'Japan to Send Troops to Remote Isle Over China Fears', *AFP*, 11 November 2010, at http://newsinfo.inquirer.net/inquirerheadlines/regions/view/20101112-302830/Japan-to-send-troops-to-remote-isle-over-China-fears.

'Japan's Defense Chief Visits Surveillance Facility Site', *PACNEWS*, 8 October 2013, at http://www.pina.com.fj/?p=pacnews&m=read&o=406469555253210a2564728bbae8bc.

'Japanese Self-Defense Forces Will be Stationed at Diaoyu Islands to Monitor China', *Best News*, 29 June 2013, at http://www.best-news.us/news-4773774-Japanese-Self-Defense-Forces-will-be-stationed-at-Diaoyu-islands-nearest-to-monitor-China.html.

'Local Anger at Japan Island Surveillance Unit', *Aljazeera*, 20 April 2014, at http://www.aljazeera.com/news/asia-pacific/2014/04/local-anger-at-japan-island-surveillance-unit-201442044145528401.html.

'Miyako to Host New Surveillance Station', *JapanUpdate.com*, 26 October 2006, at http://www.japanupdate.com/?id=7174.

'Miyako to Host New Surveillance Station', *JapanUpdate.com*, 26 October 2006, at http://www.japanupdate.com/?id=7174.

'More on Released Transcripts', *Kyodo News*, 7 September 1983, in *Foreign Broadcast Information Service (FBIS) Part IV: Asia, Pacific and East Asia*, 7 September 1983.

'Mysterious Vessel Believed to Have Radioed North Korea', *The Japan Times*, 27 December 2001, at http://www.japantimes.co.jp/cgi-bin/getarticle.p15?np20011227a1.htm.

'Mystery Boat Sinking: Tokyo Rejects Pyongyang's "Brutal Piracy" Accusations', *The Japan Times,* 28 December 2001, at http://www.japantimes.co.jp/cgi-bin/getarticle.p15?nn20011228a8.htm.

'Pro-JGSDF Mayor Wins Reelection', *Weekly Japan Update*, 6 August 2009, at http://two--plus--two.blogspot.com/2009/08/pro-jsdf-mayor-wins-reelection.html.

'Probe into the Responses Made by the Government to Suspicious Boats – Government Cautious with Eye on Relations with China, Russia ROK, while MSDF, MSA Groped for Effective Means to Pursue Them, Part 2', *Asahi Shimbun*, 7 April 1999, in American Embassy, Tokyo, 'Daily Summary of Japanese Press', 12 April 1999, at http://www.usc.edu/isd/archives/dsjp/summaries/1999/April/Sm990412.doc.

'Rabbits' Ears and Doves' Dreams: Information on North Korea's Missile Test-Firing Kept Secret – Only Bureaucrats Discuss Information With Foreign Minister and Others Kept in the Dark', *Mainichi Shimbun*, 14 August 1994, p. 1. (FBIS Translated Text), at http://fas.org/news/japan/eas95192.htm.

'Radio Transcripts on Downed ROK Plane Released', 6 September 1983, in Foreign Broadcast Information Service (FBIS) Part IV: Asia, Pacific and East Asia, 7 September 1983.

'SDF Monitored Ground-Air Communications', *Kyodo News*, 6 September 1983, in Foreign Broadcast Information Service (FBIS) Part IV: Asia, Pacific and East Asia, 6 September 1983.

'SDF Will Build a New Military Base Only 150 km Away from the Diaoyu Islands', *Best News*, 21 June 2013, at http://www.best-news.us/news-4707397-SDF-will-build-a-new-military-base-is-only-150-km-away-from-the-Diaoyu-Islands.html.

'Soviet Pilot's Conversation Reported', *Kyodo News*, 1 September 1983, in Foreign Broadcast Information Service (FBIS) Part IV: Asia, Pacific and East Asia, 2 September 1983.

'Special Press Summary: North Korean Spy Boat Incursion', *Virtual Information Centre*, 28 December 2001, at http://www.vic-info.org/regionshop.nsf/65354f99849a34e08a2568390005del16/942249be31a03f190a256b30007d612d/$FILE/Special+Press+Summary+-+North+Korean+Spy+Boat+Incursion+-+28+Dec+2001+web.doc.

'Surveillance Facility Eyed for Pacific', *The Japan Times*, 19 September 2013, at http://www.japantimes.co.jp/news/2013/09/19/national/surveillance-facility-eyed-for-pacific/.

'The Ground Radio-wave Measurement System in Nagasaki, Response to Military Threat of China', *Sankei Shimbun*, 7 March 2007, at http://www.sankei.co.jp/seiji/seisaku/070307/ssk070307000.htm.

'The GSDF Deployment to Yonaguni: Making Border Defence Explicit', *Sankei News*, 5 July 2009, at http://sankei.jp.msn.com/politics/policy/090705/plc0907050128000-n1.htm.

'Yonaguni Asks Self Defense Forces for Troop Deployment', *Weekly Japan Update*, 9 July 2009, at http://two--plus--two.blogspot.com/2009/07/yonaguni-asks-self-defense-forces-for.html.

'Yonaguni Votes in Favor of GSDF Deployment on Island', *Yomiuri Shimbun*, 23 February 2015.

Cannon, Lou, 'Reagan Announces Mild Sanctions on Soviets', *Washington Post*, 6 September 1983, p. A1.

Chapman, William, 'Russians Said to Use New Codes', *Washington Post*, 8 September 1983, p. A23.

Emerson, Judy, '2 Brothers at Iwo Jima, 1 Survived', *Rockford Register Star*, 11 November 2007, at http://iwo-jima-memoirs.tripod.com/marines_iwo_k_w_johnson2.html.

Fackler, Martin, 'Japanese Isle in Sea of Contention Weighs Fist Versus Open Hand', *New York Times*, 10 February 2011, at http://www.nytimes.com/2011/02/11/world/asia/11island.html?_r=0.

Horiguchi, Robert Y., 'US Backpedals on Japan's Defences', Pacific Defence Reporter, April 1986. http://www.sankei.co.jp/seiji/seisaku/070307/ssk070307000.htm.

Ishimatsu, Hisashi, 'Far Western Isle a Defence Outpost?' *Asahi Shimbun*, 10 July 2009, at http://www.asahi.com/english/Herald-asahi/TKY200907100075.html.

Jameson, Sam, 'Disclosures on Soviet Pilots Costly to Japan's Security', *Los Angeles Times*, 19 September 1983, pp. 1, 15.

Kallender-Umezu, Paul, 'Japan-China Island Spat Threatens GSDF Deployment and Much More', *Defense News*, 1 May 2013, at http://archive.defensenews.com/article/20130501/DEFREG03/305020013/Japan-China-Island-Spat-Threatens-GSDF-Deployment-Much-More.

Kawamoto, Tetsuo, '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 http://www.dtic.mil/dtic/tr/fulltext/u2/a346884.pdf.

Kelly, Orr, 'The Big Ears of Uncle Sam', *U.S. News & World Report*, 12 September 1983.

Kim Soonhi, 'Islanders Split as Ministry Seeks 1.5 Billion Yen to Deploy SDF', Asia and Japan Watch, *Asahi Shimbun*, 3 October 2011, at http://ajw.asahi.com/article/behind_news/politics/AJ2011100313047.

Kubo, Nobuhiro, 'Japan to Arm Remote Western Island, Risking More China Tension', *Reuters*, 18 April 2014, at http://www.reuters.com/article/2014/04/18/us-japan-military-islands-idUSBREA3H05M20140418.

Lai I-chung, 'Yonaguni Plans Raise Questions of Taiwan', *Taipei Times*, 6 July 2009, at http://www.taipeitimes.com/News/editorials/archives/2009/07/06/2003447948.

Makino, Yoshihiro, 'Japan Dropped Plan for Eavesdropping Network, Still Relies on U.S.', Asia and Japan Watch, *Asahi Shimbun*, 19 July 2013, photograph by Satoru Ogawa, at http://ajw.asahi.com/article/behind_news/politics/AJ201307190076.

Matsushita, Masakazu and Yoichi Shiraishi, 'GSDF Deployment Divides Westernmost Yonagunijima', *Yomiuri Shimbun*, 16 February 2015, at http://defence.pk/threads/gsdf-deployment-divides-westernmost-yonagunijima.359671/.

McFadden, Robert D., 'U.S. Says Soviet Shot Down Korean Airliner', *New York Times*, 2 September 1983, pp. A1, A4.

Tiezzi, Shannon, 'Japan to station troops on Yonaguni, near disputed Islands', *The Diplomat*, 19 Aril 2014, at http://thediplomat.com/2014/04/japan-to-station-troops-on-yonaguni-near-disputed-islands/.

Tokyo Shimbun, 12 August 1998, in American Embassy, Tokyo, 'Daily Summary of Japanese Press', 26 August 1998.

Tokyo Shimbun, 13 August 1998, p. 1, (FBIS-EAS-98-301, East Asia, 28 October 1998).

Tokyo Shimbun, 9 January 1999, in American Embassy, Tokyo, 'Daily Summary of Japanese Press', 13 January 1999.

Weisman, Steven R., 'U.S. Denies Having Ground-Station Tapes', *New York Times*, 8 September 1983, p. A12.

Yamazaki, Hiroyasu, 'Couple Work to Make Russian Seamen Feel at Home', *The Japan Times*, 3 December 2002, at http://search.japantimes.co.jp/cgi-bin/nn20021203b5.html.

Other web sources

Hamilton, James, 'Arctic Tower at Former Wakkanai Air Station', July 1988, at http://www.wakkanaiwasmyhome.citymax.com/albums/album_image/2863222/837532.htm.

'Japanese Code Intercept Unit WWII: History of 958th', at http://freepages.military.rootsweb.ancestry.com/~braden/.'

Koden Electronics Co., 'Land Based Radio Monitoring System', at http://www.koden-electronics.co.jp/eng/rikutan-e.html.

'NAVSECGRU Stations Past and Present', at http://www.navycthistory.com/CI_Stations_past_and_present_alphabetical_3a.html.

Odell, Frank, 'Miyako Jima: Base Update', 623rd-Det. 1, AC&W Squadron, at http://www.geocities.com/fodellus/91miyako-01.html

Person, Bill, 'War Stories: Wakkanai', at http://members.xoom.com/XMCM/youngsr/6920th/warstories.htm.

Japanese Government sources

Diet

参議院議長、土屋義彦、参議院議員吉川春子君提出自衛隊・米軍の通信基地の電波障害対策等に関する質問に対し、別紙答弁書を送付する、内閣参質一一三第一三号, 昭和六十三年十一月一日、参議院、第 113 回国会 , [Written answer to question on SDF and US Forces communications bases' interference provided by House of Councillors Chairman Tsuchiya Yoshihiko, House of Councillors, National Diet of Japan, 1 November 1988], at http://www.sangiin.go.jp/japanese/joho1/kousei/syuisyo/113/touh/t113013.htm.

Ministry of Defence/SDF

我が国の防衛と予算, 平成 25 年度概算要求の概要, (*Defense Programs and Budget of Japan, Overview of FY 2013 Budget Request*), 防衛省（Ministry of Defense), September 2012, p.5, at http://www.mod.go.jp/j/yosan/2013/gaisan.pdf.

「礼文分屯地, 分屯地の紹介」、『陸上自衛隊第２師団』、陸上自衛隊, ['Rebun Sub-base, Introduction to Sub-bases', GSDF 2nd Division], at http://www.mod.go.jp/gsdf/nae/2d/unit/butai/bunton/bunton.html.

「航空自衛隊春日基地」, ['Kasuga Air Base JASDF'], at http://www.mod.go.jp/asdf/kasuga/.

航空自衛隊、航空開発実験集団、平成 23 年度版, [JASDF, Air Development and Test Command, 2011], at http://www.mod.go.jp/j/presiding/touben/173kai/san/tou51.html.

SDF tenders [by date]

平成 17 年度 所管公益法人等との間で締結された随意契約の緊急点検結果等について(防衛本省), ['Results of urgent inspections of FY2005 negotiated contracts of public service corporations (Ministry of Defence)'], at http://www.mod.go.jp/j/procurement/tekiseika/pdf/koueki/h17-mod-03.pdf.

随意契約一覧表、平成 17 年 6 月、航空自衛隊第 3 補給処、埼玉県狭山市, ['Table of Contracts, June 2005', JASDF 3rd Supply Depot, Sayama, Saitama-ken], at http://www.mod.go.jp/asdf/3depotprocure/sonota/zuikei/riyuu/1706.pdf.

随意契約一覧表、平成 17 年 9 月、航空自衛隊第 3 補給処, 埼玉県狭山市, ['Table of Contracts, September 2005', JASDF 3rd Supply Depot, Sayama, Saitama-ken, at http://www.dii.jda.go.jp/asdf/3depotprocure/sonota/zuikei/riyuu/1709.pdf.

随意契約一覧表、平成 17 年 10 月、航空自衛隊第 3 補給処、埼玉県狭山市, ['Table of Contracts, October 2005', JASDF 3rd Supply Depot, Sayama, Saitama-ken'], at http://www.mod.go.jp/asdf/3depotprocure/sonota/zuikei/riyuu/1710.pdf.

随意契約一覧表、平成 17 年度 12 月期、海上自衛隊佐世保地方総監部, ['Table of Contracts, December 2005', MSDF Sasebo Region Headquarters], at http://www.mod.go.jp/msdf/bukei/s0/nyuusatsu/200512.pdf.

'Ooi Communications Station: Tender for Upgrading of Security Facility', 12 April 2006, at http://www.jda.go.jp/j/info/chotatsu/minaoshi/pdf/h17-jda/11.pdf.

随意契約一覧表、平成 18 年 5 月、航空自衛隊第 3 補給処、埼玉県狭山市, ['Table of Contracts, May 2006', JASDF 3rd Supply Depot, Sayama, Saitama-ken], at http://www.mod.go.jp/asdf/3dep/sonota/zuikei/riyuu/1805.pdf.

随意契約一覧表、平成 18 年 6 月、航空自衛隊第 3 補給処、埼玉県狭山市, ['Table of Contracts, June 2006', JASDF 3rd Supply Depot, Sayama, Saitama-ken'], at http://www.dii.jda.go.jp/asdf/3depotprocure/sonota/zuikei/riyuu/1806.pdf.

随意契約一覧表、平成 18 年 8 月、航空自衛隊第 3 補給処, 埼玉県狭山市, ['Table of Contracts, August 2006', JASDF 3rd Supply Depot, Sayama, Saitama-ken], at http://www.dii.jda.go.jp/asdf/3depotprocure/sonota/zuikei/riyuu/1808.pdf.

随意契約一覧表、平成 1 8 年 8 月、航空自衛隊第 3 補給処、埼玉県狭山市, ['Table of Contracts, August 2006', JASDF 3rd Supply Depot, Sayama, Saitama-ken], at http://www.mod.go.jp/asdf/3dep/koukyou/zuikei1812.pdf.

随意契約一覧表、平成 18 年 9 月、航空自衛隊第 3 補給処、埼玉県狭山市, ['Table of Contracts, September 2006', JASDF 3rd Supply Depot, Sayama, Saitama-ken'], at http://www.mod.go.jp/asdf/3dep/sonota/zuikei/riyuu/1809.pdf.

電子音響の契約希望者募集要項」装備本部　防衛施設庁、2007 年度, ['Guidelines for Applicants for Electroacoustic Equipment in Fiscal Year 2007', at http://www.epo.jda.go.jp/supply/kouji/kouzi-dai53go.pdf.

契約に係る情報の公表、平成 19 年 2 月、航空自衛隊第 3 補給処、埼玉県狭山市, ['Information Disclosure on Contracts (Acquisitions, etc), February 2007', JASDF 3rd Supply Depot, Sayama, Saitama-ken], at http://www.mod.go.jp/asdf/3dep/koukyou/zuikei1902.pdf.

随意契約一覧表、平成 19 年 5 月、航空自衛隊第 3 補給処、埼玉県狭山市, ['Table of Contracts, May 2007', JASDF 3rd Supply Depot, Sayama, Saitama-ken], at http://www.mod.go.jp/asdf/3dep/koukyou/zuikei1905.pdf.

'Open Tender for Ground Radio-wave Measurement System J/FLR-4A (Miyako-jima No. 2)', 1 February 2008, at http://www.epco.mod.go.jp/kokok/11-481/announcement20080125210841.pdf.

'Guidelines for Applicants for Parts for Communications and Electronic Equipment, Fiscal Year 2008', Ministry of Defense, 20 July 2008, at http://www.mod.go.jp/asdf/3dep/koubooyobikikaku/pdf/20_kouji171.pdf.

地上電波測定装置 J/FLR-4A (宮古島) (その 3) 用初度部品 1 式、案件公示日　2009/09/15、入札情報サービス NJSS, ['Ground radio wave measuring device J / FLR-4A (Miyakojima) (Part 3), initial parts 1 set, Project announcement date: 15 September 2009', NJSS Tender Information Service, at http://www.njss.info/offers/view/206892/.

'Official Announcement No. 400: Public Bid for Ground Radio-wave Measurement System J/FLR-4A (Miyako-jima), Part 3', 22 January 2009, at http://announcement20090109221000.pdf

公示第 49 号、平成 23 年 3 月 14 日、変更公示, 分任支出負担行為担当官、航空自衛隊第 3 補給処, [Notice of change, Public Notice No. 49, 14 March 2011, JASDF 3rd Supply Depot], item 4097, at http://www.mod.go.jp/asdf/3dep/koubooyobikikakukyousou/kouji_pdf230314kouji49.pdf.

平成 24 年度調達予定品目（中央調達)『電子音響課』, ['FY 2012 Procurement Plan Items (Central Procurement). Electronics and Acoustics'), Equipment Procurement and Construction Office, Ministry of Defense], at http://www.epco.mod.go.jp/supply/jisseki/choutatuyotei_dennon.pdf.

公示第 50 号, 平成 24 年 4 月 23 日. 変更公示. 分任支出負担行為担当官、航空自衛隊第 3 補給処長」防衛書, ('Public Notice No. 50, 23 April 2012. Notice of changes. Responsible officer: Head, Third Supply Depot, ASDF', Ministry of Defence), at http://www.mod.go.jp/asdf/3dep/koubooyobikikakukyousou/kouji_pdf/240423kouji50.pdf.

公示第 56 号, 平成 24 年 5 月 17 日. 変更公示. 分 任支出負担行為担当官、航空自衛隊第 3 補給処長」防衛書, ['Public Notice No. 56, 17 May 2012. Notice of changes. Responsible officer: Head, Third Supply Depot, ASDF', Ministry of Defence], item 6699, at http://www.mod.go.jp/asdf/3dep/koubooyobikikakukyousou/kouji_pdf/240517kouji56.pdf.

Other Japanese government ministries and agencies

地理院地図（電子国土 Web) [Geographical Survey Institute, (Electronic National Territory Web)], at http://watchizu.gsi.go.jp/watchizu.aspx?id=65453150&slidex=0&slidey=800.

Japanese non-government sources

『安保、自衛隊そして憲法と北海道』、日本平和大会北海道実行委員会, [*The Alliance, the SDF, the Constitution and Hokkaido*, Hokkaido Action Committee, Japan Peace Conference, October 1991].

「川北通信所、『北方最前線！！　謎のレーダーサイト！？』」、千島の桜 ～ Hokkaido Nakashibetsu ～　[*Kawakita Communications Station, 'Frontline Hokkaido!! Radar site mystery!?', Cherry Blossoms of Chishima - Nakashibetsu Hokkkaido*], at http://blogs.yahoo.co.jp/panzer_tiger222/archive/2009/10/3?m=lc.

「背振山通信基地群」、『福岡県の軍事基地』、福岡県平和委員会、['Sefuri Mountain Communications Bases Group', Fukuoka Prefecture Military Bases, Fukuoka Peace Committee], at http://www.peace-fuk.net/sehuri/sefuri.html.

「大刀洗通信所」、酒見辰正（著者）、福岡県平和委員会, 1993.11.18, [Sakemi Tatsumasa, "The Tachiarai Communications Station!", Fukuoka Prefecture Peace Committee, 18 November 1993].

「太刀洗通信所」、『福岡県の軍事基地』、福岡県平和委員会、酒見辰正（著者), [Sakemi Tatsumasa, 'Tatiarai Communications Station', Fukuoka Prefecture Military Bases, Fukuoka Peace Committee], at http://www.peace-fuk.net/tatiarai/tatiarai.htm.

「大刀洗通信所大。。！」、酒見辰正（著者）、福岡県平和委員会, [Sakemi Tatsumasa, "Big .. at the Tachiarai Communications Station!", Fukuoka Prefecture Peace Committee, February 2002].

『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 C^3I 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].

「稚内情報基地調査報告」、佐藤佑二（著）、1988 年 11 月 28 日 [Sato Yuji, 'Survey Report on Wakkanai Intelligence Base', 28-29 October 1988].

「稚内軍事基地」、佐藤佑二（著）、平和会レポート、1988 年 8 月 30 日, [Sato Yuji, 'Wakkanai Military Base', Report of Visiting Peace Group, 30 August 1988].

「小舟渡通信所『象の折』、調査報告」、新潟平和委員会、1988 年 11 月 8 日, [Report of an Investigation into the Kobunato Communications Station "Elephant Cage", Niigata Prefecture Peace Committee, November 8, 1988].

Books and monographs – Japanese language

『新情報戦』、朝日新聞社 (編集)、1978 年 8 月発行, [Asahi Newspaper Company, Neo-Information War, (Tokyo: Asahi, 1978).]

Articles

「関東地方の主な米軍・自衛隊施設に関する 2014 年度補正予算案及び 2015 年度予算案について」, 塩川鉄也（著者）, Blogos, 2015 年 01 月 24 日, [Shiokawa Tetsuya, 'The major US forces and the SDF fiscal 2014 supplementary budget related to facilities in the Kanto region and budget in fiscal 2015', Blogos, 24 January 2015], at http://blogos.com/article/104170/

「標津分屯地」、ウィキペディア、[JGSDF Vice-Camp Shibetsu, Wikipedia - Japanese] , at http://ja.wikipedia.org/wiki/標津分屯地.

「第 301 沿岸監視隊」、ウィキペディア, ['JGSDF 301st Coast Observation Unit', *Wikipedia - Japanese*], at https://ja. ja.wikipedia.org/wiki/第 301 沿岸監視隊.

「追跡！日本の無線傍受施設と米情報機関を結ぶ『線』」、Vladimir（著者）『公安アンダーワルド：日本の秘密情報機関』(別冊宝島 Real 012)、2001 年 4 月, [Vladimir, 'Chase! The tie between Japan's radio monitoring facilities and American intelligence agencies', in Public Security Underworld: Japan's Secret Intelligence Agencies, (Tokyo: Bessatsu Takarajima Real, No. 12, 2001].

News reports – Japanese language

「奄美の自然と平和を守る郡民会議、総決起集会」、南海日日新聞、1999 年 04 月 16 日, [District People Pally to Protect Amami's peace and nature', *Nankai Daily*, 16 April 1999], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/990416_nankai.html.

大井通信所 防衛情報本部、「インテリジェンス情報力、自衛隊 50 年」、朝日新聞 2004 年 9 月 24 日, ["Ooi Communications Station, Defense Agency Intelligence Headquarters", in 'Intelligence Power: 50 Years of the Self Defence Forces', *Asahi Shimbun*, 21 September 2004].

「大きな穴が空自レーダーサイト・奥尻島」、毎日新聞、1993 年 07 月 14 日, ['Okushiri Radar Site Damaged', *Mainichi Shimbun*, 15 July 1993].

「喜界島『象のオリ』、建設予定地で反対派サトウキビ植え付け」、朝日新聞 1998 年 09 月 13 日, ['Kikaijima "Elephant Cage": Opposition Planting Sugar Cane at Construction Site', *Asahi Shimbun*, 13 September 1998], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/980913_asahi.html.

「喜界島「象のオリ」運用へ　防衛庁の通信傍受施設", 共同通信, ['Kikaijima "Elephant Cage" Defense Agency communications interception facility operational', Kyodo News*], 47News, Japan Press Network*, 15 March 2006, at http://www.47news.jp/CN/200603/CN2006031501004268.html.

「喜界島象のオリ、防衛庁が７８００万円を概算要求」、南海日日新聞、2000 年 09 月 02 日, ['Defence Agency Budget Request for 78 Million Yen for Elephant Cage', *Nankai Daily*, 2 September 2000], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/000902_nankai.html.

「喜界島象のオリ関連予算 8000 万円を要求」、南海日日新聞、1998 年 09 月 02 日, ['Elephant Cage-Related Budget Request for 80 Million Yen', *Nankai Daily*, 2 September 1998], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/980822_nankai.html.

「国際反戦デー奄美地区総決起集会」、南海日日新聞、1999 年 10 月 21 日, ['Amami Regional International Anti-War Day Pep Rally', *Nankai Daily*, 21 October 1999], http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/991021_nankai.html.

「国際反戦デー奄美地区総決起集会」、南海日日新聞、2000 年 10 月 21 日, ['Amami Regional International Anti-War Day Pep Rally', *Nankai Daily*, 21 October 2000], at http://www.synapse.ne.jp/~bak/kikai/elephant/history.html.

「３件で総額 87 億円余　陸自沿岸監視部隊 今後、レーダー基地も」、八重山毎日、2015 年 02 月
26 日 ['Three buildings to costs a further 8.7 bn yen; and a future radar station as well as a GSDF Coastal Observation Unit', *Yaeyama Mainichi*, 26 February 2015], at http://www.y-mainichi.co.jp/news/26915/.

「象のオリ建設予定地で地質調査始まる」、南海日日新聞、1998 年 08 月 22 日, ['Geological Survey to Begin at Elephant Cage Construction Site', *Nankai Daily*, 22 August 1998], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/980822_nankai.html.

『「象のオリ」川嶺地区が動く』、南海日日新聞、1991 年 08 月 08 日, ['Kawamine district "elephant cage" movement', *Nankai Daily*, 8 August 1991], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/910808_nankai.html.

「『象のオリ』建設阻止へ 出身者らが奄美を守る会」、 南日本新聞、1998 年 10 月 12 日, ['Blocking Construction: Locals Meet to Protect Amami, Stop "Elephant Cage"', *Minami Nippon Shimbun*, 22 October 1998], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/981022_minami.html.

「"象のオリ" 阻止を、川嶺集落内をデモ行進、喜界」南海日日新聞　1991 年 11 月 10 日, ['Kikaijima: Stop the "elephant cage"; demo march in Kawamine village', *Nankai Daily*, 10 November 1991, at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/911110_nankai.html.

「"象のオリ" 反対請願を一転採択　住民の意思」野村町長　喜界町議会で全会一致」南海日日新聞　1986 年 12 月 24 日, ['Town Council Unanimously Adopts Petition Against Kikai Elephant Cage', *Nankai Daily*, 24 December 1986], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/861224_nankai.html.

「象のオリ用地 8 割買収契約 喜界島」、南海日日新聞、1998 年 07 月 03 日, ['Elephant Cage, 80 per cent of Land Purchased', *Nankai Daily*, 3 July 1998], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/980703_minami.html.

「18 重要防衛対策」、朝雲新聞社、2006 年 3 月 9 日, ['18 Important Defence Measures', *Asagumo News*, 9 March 2006], at http://www.asagumo-news.com/news/200603/060309/06030904.html.

「７万人署名へ運動 地区労が方針決める」、南海日日新聞、1987 年 01 月 09 日, ['70,000 sign petition; District labour council policy decision', *Nankai Daily*, 9 January 1987, at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/870109-2_nankai.html.

「福江島にスパイアンテナ装置建設へ」、Peace Papers, 長崎平和委員会、2010 年 11 月 30 日」
['Construction of spy antenna facility on Fukuejima', *Peace Papers*, Nagasaki Peace Committee, 30 November 2010], at http://www7b.biglobe.ne.jp/~chi-tan/news/news101130.html.

「不審船、破壊工作目的か　北朝鮮と暗号交信」、東京新聞、2001/12/29
'Suspicious ship intent on sabotage? North Korean encrypted communications', *Tokyo Shimbun*, 27 December 2001, at http://soejima.to/boards/trafics/7.html

「北海道・稚内電波観測所、1955 年 10 月 撮影」、*Mainichi Photo Bank*, ['Wakkanai, Hokkaido radio observation station, photo taken November 1955'], *Mainichi Photo Bank*, at http://photobank.mainichi.co.jp/dpscripts/DPDetail.dll?Detail

「防衛庁、『象のオリ』概算要求で１億円」、南海日日新聞、1999 年 09 月 02 日, ['Defence Agency Requests 100 Million Yen for Elephant Cage', *Nankai Daily*, 2 September 1999], at http://www.synapse.ne.jp/~bak/kikai/elephant/refference/news/990902_nankai.html.

「宮古島に電波測定施設 航空自衛隊分屯基地」、琉球新報、2006 年 10 月 24 日
, ['The Radio Measurement System in Miyako-jima, JASDF Sub-base', *Ryukyu Shimpo*, 24 October 2006], at http://ryukyushimpo.jp/news/storyid-18270-storytopic-3.html.

「予定地内の畑でサトウキビ収穫作業」、南海日日新聞　2001 年 03 月 19 日, ['Harvesting Sugar Cane at the Planned Site'], *Nankai Daily*, 19 March 2001, at http://www.synapse.ne.jp/~bak/kikai/elephant/reffernce.html.

'Defense Agency Knew in Advance of Suspicious Ship', *Mainichi Shimbun*, 26 December 2001, at http://mdn.mainichi.co.jp/news/20011226p2a00m0fp007000c.html.

'East China Sea Radio-wave Detection Increase: Collection of Chinese Information Strengthened', *Sankei Shimbun*, 5 November 2006, at http://sankei.co.jp/news/041105/morning/05iti001.htm.

'Gov't Eyes Obtaining Land on Southwestern Isle for Coastal Monitoring', *Mainichi Shimbun*, 21 August 2011.

'Japan to Give Up Yonaguni Garrison Only 150 km Away from Diaoyu Islands', *Sankei Shimbun*, 20 March 2013.

'Japan to Reassess Plan to Deploy Troops on Yonaguni', *NHK News*, 26 September 2009, at http://www.nhk.or.jp/news/t10015700241000.html#.

'Land-owner Supports the Opposition', 4 May 1998, at http://www.synapse.ne.jp/~bak/kikai/elephant/reffernce.html.

'Last Harvesting at Elephant Cage Site', *Minami Nihon Shimbun*, 27 March 2005, at http://www.373news.com/2000picup/2005/03/picup_20050327_1.htm.

'Radio-wave Measurement Facility at Miyako-jima: Chinese Military Intelligence-gathering', *Okinawa Times*, 24 October 2006.

'The Elephant Cage Opening Ceremony', 15 March 2006, at http://d.hatena.ne.jp/pahoo/20060315.

'The Ground Radio-wave Measurement System in Nagasaki, Response to Military Threat of China', *Sankei Shimbun*, 7 March 2007, at http://www.sankei.co.jp/seiji/seisaku/070307/ssk070307000.htm.

Other Web sources – Japanese language

「防衛情報」、 Der Angriff ホームページ』、1998 年 5 月 28 日, ['Defense Information', Der Angriff , 25 May 1998], at http://obuchi.naikaku.com/angriff/log/oldmain/03/na980505.html.

『喜界島「象のオリ」問題、これまでの経緯』、Ohguchi Bak（著者), [Ohguchi Bak, 'The Kikaijima "Elephant Cage" Problem: the story to date'], at http://www.synapse.ne.jp/bak/kikai/elephant/history.html.

「防衛省情報本部、大井通信所、(受信所)」、『アンテナの見える風景』, ['Defence Intelligence Headquarters, Ooi Communications (Receiving) Station', *Antenna Scenes*, at http://home.p04.itscom.net/yama/Ooi/Ooi.htm.

「防衛省情報本部、小舟渡通信所（受信所）」、『アンテナの見える風景』、2007 年 4 月, ['Defense Intelligence Headquarters Kobunato Communications Station', Antenna Scenes, April 2007], at http://home.p04.itscom.net/yama/Kofunato/Kofunato.htm.

Chinese language sources

「日媒及专家极力渲染中国潜艇、战机威胁」、作者 耀龙、国防时报数字报刊、2009 年 1 月 10, [Yao Long, 'Japanese media and experts greatly exaggerated the Chinese submarine, fighter threat', National Defence Journal, 10 January 2009], at http://gfsb.newssc.org/html/2009-01/10/content_399901.htm.

Other sources

Correspondence from Sakemi Tatsumasa, 28 April 2008.

Correspondence from Sakemi Tatsumasa, 1 May 2008.

Note on Wakkanai, 30 June 1992, in files provided by Owen Wilkes.

'Questions from Sato Yuji and Answers from Sakemi Tatsumasa re Tachiarai Changes Since 2002', 21 July 2003.

Undated note on the Miho station in files provided by Owen Wilkes.