

11. JMSDF SIGINT Collection and Ocean Surveillance Ships

The Japanese Maritime Self-Defense Force (JMSDF) has a small fleet of 'oceanographic survey and research vessels' and other auxiliary vessels that it uses for varied ocean surveillance activities. The fleet includes three ships that are equipped for signals intelligence (SIGINT) collection activities (the *Nichinan* AGS/AGI 5105 and the *Shonan* AGS 5106, operated by the Oceanographic Command HQ at Yokosuka, and the *Shirase* AGB/AGI 5003 polar icebreaker) and two Surveillance Towed Array Sensor System (SURTASS) ocean surveillance ships (the *Hibiki* AOS 5201 and the *Harima* AOS 5202) operated by the Fleet Intelligence Command (FIC) (see Table 3).

The JMSDF's first ship configured for SIGINT collection was the *Akashi* (AGS/AGI 5101), built by the Nippon Steel Tube Company at Tsurumi, near Yokohama, where it was laid down in September 1968, launched in May 1969, and commissioned in October 1969. It had a length of 74 metres, a displacement of 1,420 tons, and a range of 26,500 kilometres (at 14 knots), with a crew of 75 (including about 10 SIGINT technicians). It had 'a large number of electronic intercept aerials', including a NEC NOLR-6 ESM system for radar intercepts. It was withdrawn from service and replaced by the *Nichinan* in 1999.¹

The *Nichinan* AGS/AGI 5105 was planned in 1996, laid down in August 1997, launched in June 1998, and commissioned in March 1999. Built by Mitsubishi at its Shimonoseki shipyards, it has a length of 111 metres and a displacement of 3,300 tons, and a complement of 80.² In order to 'improve its observation capability', it has an electric propulsion system which produces less noise, in addition to its main diesel engines. Its equipment includes an 'ocean observation system', a towed side-sonar array, sonobuoys, and a remotely operated vehicle (ROV).³ It also has a dynamic positioning system (DPS) to automatically keep the ship at a fixed position.⁴

The *Nichinan's* activities are usually unannounced and unreported. On 10 February 2006, however, the JMSDF issued a press release saying that the *Nichinan* was conducting surveys of the continental shelf south of Kyushu. It stated that: 'The survey is proceeding, but this announcement is an unusual

1 Richard Sharpe (ed.), *Jane's Fighting Ships 1996-97* (Jane's Information Group, Coulsdon, Surrey, 99th edn, 1996), p. 383.

2 Richard Sharpe (ed.), *Jane's Fighting Ships 2000-2001* (Jane's Information Group, Coulsdon, Surrey, 103rd edn, 2000), p. 385.

3 'AGS *Nichinan* Class', *GlobalSecurity.org*, at www.globalsecurity.org/military/world/japan/nichinan.htm

4 'Dynamic Positioning System', 三井造船 [Mitsui Engineering & Shipbuilding] at www.mes.co.jp/english/business/ship/ship_11.html

exception in the usually highly secret activities of the ocean observation ship'. It said that the survey work would continue until early March. Other official sources said that the *Nichinan* had conducted similar survey work in the area in January–February 2005. The surveys had been mandated by a 'Meeting of Relevant Ministers and Agencies on Continental Shelf Survey and Marine Resources', in order to demarcate the continental shelf following the intrusions of Chinese 'observation' and marine survey ships inside Japan's claimed exclusive economic zone (EEZ) in 2004–05.⁵

Table 3. JMSDF ocean surveillance ships

Name	Designation	Type	Commissioned
1. Nichinan	AGS/AGI-5105	Ocean Survey	1999
2. Shonan	AGS-5106	Ocean Survey	2011
3. Suma	AGS-5103	Ocean Survey	1982
4. Futami	AGS-5102	Ocean Survey	1979
5. Wakasa	AGS-5104	Ocean Survey	1986
6. Shirase	AGB-5003	Icebreaker	2009
7. Hibiki	AOS-5201	SURTASS	1991
8. Harima	AOS-5202	SURTASS	1992

The *Nichinan's* activities gained media attention again in January 2014, when it was reported that it had lost its ROV when the cables connecting the device with the ship broke on 30 November 2013 while it was operating in the Tsugaru Strait. A Ministry of Defense (MoD) official stated on 29 January that the ROV 'was being used to survey the underwater terrain as well as water currents and temperatures' in the strait. Press reports noted that such data was used 'to track the movements of foreign submarines nearby'.⁶ A Chinese report identified the

5 JMSDF, "'Nichinan' Carrying Out Continental Shelf Survey', 10 February 2006, at jmsdf.sakura.ne.jp/news/c-news/18/021002.htm; 「海洋観測艦「にちなん」の活動について 17.1.21 (海上自衛隊海上幕僚監部)」, 徒然日記「多事某論」保管庫 [Activities of the Ocean Surveillance Ship "Nichinan", 21 January 2005 (JMSDF Maritime Staff Office), 'At a Loose End Diary: "A Certain Theory about Many Events"', 25 January 2005, at boscl1945.exblog.jp/1844865]

6 'MSDF Admits Losing Submersible in Tsugaru Strait', *Japan Times*, 29 January 2014, at www.japantimes.co.jp/news/2014/01/29/national/msdf-admits-losing-submersible-in-tsugaru-strait/; 'MSDF Unmanned Survey Device Lost at Sea after Cable Severed', *Kyodo News International*, 29 January 2014, at www.globalpost.com/dispatch/news/kyodo-news-international/140129/msdf-unmanned-survey-device-lost-at-sea-after-cable-se

ROV as an SCV-3000, which measured 3 metres in length, 1.7 metres in height and 1.7 metres in width, weighed four tons, and was 'equipped with cameras and sonar detectors'; it said that the JMSDF needed improved oceanographic data because China's submarines had become quieter in recent years.⁷ The MoD, Itsunori Onodera, stated on 31 January that the 'underwater survey was resumed using one of the other ROVs the MSDF possesses'.⁸

The *Shonan* AGS 5106 was authorised in FY 2006, laid down in December 2008, launched in June 2009, completed in March 2010 and commissioned in March 2011. It was built by the Mitsui Engineering and Shipbuilding Company at Tamano in Okayama Prefecture. It has a length of 103 metres and a width of 16.4 metres and a standard displacement of 3,200 tonnes or 4,150 tonnes with a full load. It is capable of a speed of 16 knots, and carries a crew of 80.⁹ It is home ported, together with the *Nichinan*, at Yokosuka.¹⁰

In addition to the *Nichinan* and the *Shonan*, the Oceanographic Command currently has three other ocean survey and research ships: the *Suma* AGS 5103 coastal survey ship, which became operational in 1982; and the *Futami* AGS 5102 and *Wakasa* AGS 5104 oceanographic research ships, which became operational in 1979 and 1986 and are 'fitted for hydrographic survey and cable laying', and which carry RCV-225 remote-controlled underwater survey submarines.¹¹

The JMSDF has also had two successive polar icebreakers equipped for communications intelligence (COMINT) and electronic intelligence (ELINT) collection – the *Fuji* AGB/AGI 5001 (1965–83) and the *Shirase* AGB/AGI 5002 (1982–2007). They typically operated in the Antarctic for several months each year during the northern summer, but operated in the area north of Hokkaido in the winter, when these waters are covered with thick ice and inaccessible to the primary Auxiliary General Intelligence (AGI) ship. The *Fuji* was built by Nippon Steel Tube Company at Tsurumi, and was commissioned in July 1965. It was 100 metres long and had a normal displacement of 7,760 tons, and was equipped with a large horizontal HF log-periodic antenna, navigation and weather radars, an SQS-11A sonar system, a HF DF crossed-loop antenna system, a NIPRORI-1 sea gravimeter system, three helicopters, and carried a crew of 200 plus 35 'scientists and observers'.¹²

7 'SDF Lost Influence Underwater Robot Submarine Reconnaissance China', 29 January 2014, at www.wantinews.com/news-6326393-SDF-lost-influence-underwater-robot-submarine-reconnaissance-China.html

8 'Press Conference by the Defense Minister Onodera', Ministry of Defense, 31 January 2014, at www.mod.go.jp/e/pressconf/2014/01/140131.html

9 'Shonan Class Ocean Survey Ship', *JMSDF Vessels*, at homepage2.nifty.com/nishidah/e/dtc0635.htm

10 Captain Sato, 'Activities of Oceanographic Command JMSDF', 10 February 2012, at www.rioe.or.jp/mts20120210_3.pdf

11 Andrew Toppan, 'World Navies Today: Japan', 23 May 2002, at www.hazegray.org/worldnav/asiapac/japan.htm; Sharpe (ed.), *Jane's Fighting Ships 2000–2001*, p. 386.

12 John Moore (ed.), *Jane's Fighting Ships 1982–83* (Jane's Publishing Company, London, 85th edn, 1982), p. 270; Sagawa Jiro, Kaminuma Katsutada and Ueda Yoshio, 'Sea Gravimeter System of the Icebreaker "SHIRASE"',

The *Fuji* was replaced by the *Shirase* AGB/AGI 5002 in 1983. It was also built by Nippon Steel Tube Company at Tsurumi; it was laid down in March 1981, launched in December 1981, and commissioned in November 1982. It was 134 metres long, and had a displacement of 11,600 tonnes. It had a crew of 170, and could carry 60 ‘scientists and observers’, and was ‘fully equipped for marine and atmospheric research’. Its equipment included a JRC OPS-18-1 G-band surface search radar, an OPS-22 I-band navigation radar, two electronic support measures (ESM) systems, a HF DF crossed-loop antenna, a weather radar in a large radome, ‘various ocean observation units’, and three helicopters.¹³ The NIPRORI-1 sea gravimeter system was transferred from the *Fuji*, but improvements to enhance its capabilities were incorporated in the process, including installation of a larger data processing unit and improved software for data processing.¹⁴ The *Shirase* (AGB 5002) was decommissioned in April 2007. Its successor, also named *Shirase* (AGB 5003), became operational in November 2009.¹⁵

The JMSDF’s two SURTASS or ‘acoustic measurement ships’, the *Hibiki* AOS 5201 and the *Harima* AOS 5202, also called J-AOS (Japanese Auxiliary Oceanographic System) ships, became operational in 1991 and 1992. The JMSDF had initially planned to procure five SURTASS ships, but the program was truncated with the end of the Cold War. The ships were built at the Mitsui shipyard in Tamano. They have a crew of 40, and are both home ported at Kure.¹⁶

Construction of the *Hibiki* AOS 5201 was authorised on 24 January 1989; it was launched in July 1990 and commissioned in January 1991. It then sailed to the United States for installation of the UQQ-2 SURTASS array.¹⁷ Called the NQQ-2 in Japan, the passive array is towed by a 1,830-metre-long cable when in deep water, or as a ‘twin-line towed array’ with two shorter (800-metre) cables when operating in shallow water.¹⁸

Memoirs of National Institute of Polar Research, September 1984, at <http://ci.nii.ac.jp/naid/110000009895/en/>
13 Sharpe (ed.), *Jane’s Fighting Ships 2000–2001*, p. 386; JMSDF, ‘“Shirase” AGB 5002’, at www.mod.go.jp/msdf/formal/gallery/ships/agb/index.html

14 Sagawa Jiro, Kaminuma Katsutada and Ueda Yoshio, ‘Sea Gravimeter System of the Icebreaker “SHIRASE”’, at ci.nii.ac.jp/naid/110000009895/en/

15 ‘Icebreaker Shirase Bids Farewell to Antarctica’, 15 February 2007, at www.breitbart.com/print.php?id=D8UR5GE00&show_article=1; ‘Point of View. Katsutada Kaminuma: Icebreaker Shirase Still Good for Another Year’, *Asahi Shimbun*, 11 March 2007, at www.asahi.com/english/Herald-asahi/TKY200711030051.html; ‘新南極観測船「しらせ」’, *日本マリンエンジニアリング学会誌* 第45巻 第2号 (2010) [‘New Antarctic Research Ship’, *Journal of the Japan Institute of Marine Engineering*, (Vol. 45, No. 2), 2010], pp. 32–37, at www.jstage.jst.go.jp/article/jjme/45/2/45_180/_pdf

16 Friedman, *Naval Institute Guide*, p. 24; ‘AOS Hibiki Class’, *GlobalSecurity.org*, at www.globalsecurity.org/military/world/japan/hibiki.htm; James Simpson, ‘Japan’s Ears on the Sea’, at medium.com/war-is-boring/japans-ears-on-the-sea-39bf83f0acb7

17 Sharpe (ed.), *Jane’s Fighting Ships 2000–2001*, p. 385; ‘AOS Hibiki Class’, at www.globalsecurity.org/military/world/japan/hibiki.htm; Simpson, Simpson, ‘Japan’s Ears on the Sea’, at medium.com/war-is-boring/japans-ears-on-the-sea-39bf83f0acb7

18 ‘Acoustic Measurement Ship “HIBIKI” Type’, *Vessel and Ships Photo Gallery*, at www.vspg.net/jmsdf/aos-hibiki-class.html

Five US Navy technicians serve aboard each J-AOS ship. According to Norman Friedman, the 'US technical crews ... operate the sensors', and 'Japan and the United States share their surveillance data'.¹⁹

Both the J-AOS ships were included in a major 'block upgrade' of the US Navy's SURTASS ships in 1997–98. The capabilities of the passive acoustic data collection and analysis system were expanded by adding a reduced diameter array (RDA) and a commercial off-the-shelf (COTS) processing system to 'provide increased detection capability, more flexible and higher resolution spectrum analysis, and improved target bearing'. The communications system was also upgraded to provide additional UHF satellite communications (Satcom) voice and data connectivity between the SURTASS vessels and 'tactical platforms'.²⁰

The 'block upgrade' also added an active adjunct to the towed array, involving a WQT-2 LFA (low-frequency active) system for detection of quieter submarines in shallow and coastal waters. In addition to the 'active transmit array and handling system', the LFA system includes 'power amplification and control systems, an active signal processing and display receive system, and an environmental analysis system'.²¹ Hughes also received a contract in February 1998 for 'SURTASS/J-AOS block upgrade system software maintenance'.²²

Data collected by the SURTASS vessels is sent to a data collection and analysis station at Yokosuka using AN/WSC-6(V)1 satellite communications systems.²³ The WSC-6(V)1 has a 1.22-metre diameter reflector dish in a radome that is 1.57 metres in diameter and 2.16 metres high. The WSC-6(V) uses the US Defense Satellite Communications System (DSCS)-III satellite system; it transmits in the 7.9–8.4 gigahertz band and receives in the 7.25–7.75 gigahertz band.²⁴

The JMSDF's Oceanographic Command also maintains a cable-laying and repair ship, which is not only essential for laying and repairing the cables connecting the fixed sea-bottom hydrophone arrays with their respective shore stations, but which also has extensive ocean survey capabilities. For a quarter of a century, this was the *Tsugaru* ARC 481, one of the first products of Japan's postwar domestic ship-building program, which was approved by the United States in 1953. Built by the Yokohama Shipyard, it was laid down in December 1954, launched in July 1955 and became operational in December 1955, and initially

19 Friedman, *Guide to World Naval Weapons Systems*, pp. 21, 24; Toppan, 'World Navies Today: Japan', at www.hazegray.org/worldnav/asiapac/japan.htm; 'Japan-US Security Treaty After 50 Years — Phantom Alliance', in American Embassy, Tokyo, 'Daily Summary of Japanese Press', 28 August 2001.

20 'Sensors', *America's Navy*, at www.navy.mil/navydata/policy/vision/vis98/vis-p10.html

21 *ibid.*

22 US Department of Defense, 'Contracts for Thursday, February 12, 1998', at www.defenselink.mil/contracts/contract.aspx?contractid=1215.

23 Sharpe (ed.), *Jane's Fighting Ships 2000–2001*, p. 385.

24 'AN/WSC-6(V) SHF SATCOM Set', in John Williamson (ed.), *Jane's Military Communications, 1996–97* (Jane's Information Group, Coulsdon, Surrey, 17th edn, 1996), pp. 376–77.

served as a mine layer in addition to its 'main mission ... to lay listening devices' around bases and ports. In a major refit in 1969–70, it was lengthened, widened, and its displacement increased from around 1,000 tons to 2,150 tons. The mine racks were removed, its QHBa sonar was replaced with a more advanced SQS-11A system, and it was converted into a specialised cable-laying ship carrying a crew of approximately 100. It was withdrawn from service in March 1980.²⁵

The *Tsugaru* was succeeded by the *Muroto* ARC 482, built by Mitsubishi at its Shimonoseki shipyard. Launched in July 1979 and commissioned in March 1980, it has a length of 133 metres, a displacement of 4,500 tons, and a crew of 135. It has an 'ocean survey capability', as well as a special 'burying system' for hiding or protecting the sea-bottom cables.²⁶ It is home ported at Kure, but often works out of Ominato or Sasebo. Its activities have been described as 'secrets within a secret'.²⁷

The JMSDF also has two experimental ships (ASEs) with extensive electronic surveillance and acoustic capabilities. The *Kurihama* ASE 6101 was built by Sasebo Heavy Industries for the Technical Research and Development Institute (TRDI) 'for testing underwater weapons and sensors'. Launched in September 1979 and commissioned in April 1980, it has a length of 68 metres, displacement of 950 tons, and a crew of 40 plus 12 scientists.²⁸

The *Asuka* ASE 6102 'radar and sonar trials ship', operated by the Development and Training Command, is equipped to test and evaluate a variety of electronic surveillance, radar, sonar, and countermeasures systems. Built by Sumitomo Heavy Industries at Uruga, in Yokosuka, and commissioned in March 1995, it has a length of 151 metres and displaces 4,250 tons, a helicopter flight deck, and a complement of 72 plus up to 100 scientists. It is home ported at Yokosuka. It is equipped with an FCS-3 weapons control system, utilising a 'mini-Aegis' SPY-1D-type E/F-band air search radar, as well as a Melco OPS-14B D-band air/surface search radar, a JRC OPS-18-1 G-band surface search radar, and a Type 3 I/J-band fire control radar.²⁹ It is also equipped with an infra-red suppression system (IRSS) produced by Davis/Defence Research Establishment

25 'JMSDF Ships — ARC 481 Tsugaru Class', けいのがらくた置き場 [Kei's Boneyard]], at www2c.airnet.ne.jp/junkyard/jmsdf/ARC481Tsugara.html; 'Japanese Minelayers', at www.battleships-cruisers.co.uk/japanese_minelayers.htm

26 Sharpe (ed.), *Jane's Fighting Ships 2000–2001*, p. 385; 'ARC Muroto Class', at www.globalsecurity.org/military/world/japan/muroto.htm

27 Taoka Shunji, 'Sea-lane Defence', *Asahi Shimbun*, 1 May 1984.

28 Sharpe (ed.), *Jane's Fighting Ships 2000–2001*, p. 386.

29 Sharpe (ed.), *Jane's Fighting Ships 2000–2001*, p. 386; Toppan, 'World Navies Today: Japan', at www.hazegray.org/worldnav/asiapac/japan.htm

Suffield (DRES) in Alberta, Canada, and supplied to Sumitomo Heavy Industries in January 1994, for reducing its infra-red signature by cooling the hot metal and gases generated by its gas turbine engines.³⁰

³⁰ 'IRSS for Japanese Frigate', *Davis Newsletter*, July 1997, at www.wrdavis.com/docs/news/html/07/index.html

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