

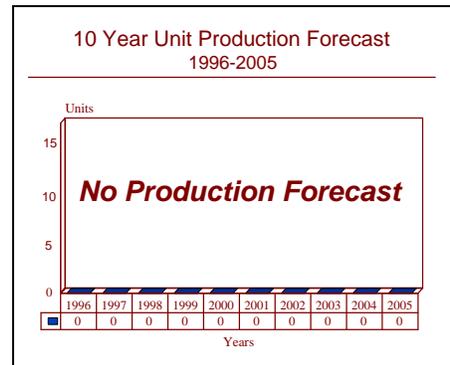
ARCHIVED REPORT

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SPS-55(V) - Archived 5/97

Outlook

- More than 200 units in use; still in service and on-going logistics support is being provided for the system
- Being replaced by SPS-67 on newer ships
- Production ended 1993 on new installations
- Spares and repair market will probably exist until 2020
- Turkey shown interest to upgrading its SPS-10 to SPS-55



Orientation

Description. Naval Surface Search and Navigation Radar.

Sponsor

US Navy
 Naval Sea Systems Command (NAVSEA)
 2531 Jefferson Davis Highway
 Arlington, Virginia (VA) 22202
 USA
 Tel: +1 703 602 3381

Contractors

Cardion Electronics Inc

Long Island Expressway
 Woodbury, New York (NY) 11797
 USA
 Tel: +1 519 921 7300

Status. In service, ongoing logistics support.

Total Produced. Over 200 units have been produced for worldwide use.

Application. The system is used on a variety of ships, including guided missile cruisers and destroyers, as well as Perry class frigates.

Price Range. Estimated unit cost is US\$225,000.

Technical Data

Dimensions	Metric	US
Antenna		
Weight:	88 kg	195 lb
Dimensions:	203 x 71 cm	80 x 28 in
Characteristics		
Frequency:	9.05 to 10 GHz 5.45 to 5.825 GHz (alternate version)	
Peak power:	130 kW	
PRF/Pulse width:	750 pps/1 µsec (long range) 2250 pps/0.12 µsec (short range)	
Minimum range:	50 or 300 yards	
Resolution:	75/650 ft	

Polarization:	Horizontal or circular
MTBF:	1200 hrs (demonstrated)
Antenna rotation:	16 rpm
Horizontal beamwidth:	1.5°
Vertical beamwidth:	20°
Units:	AS-2953 Antenna AB-1211 Pedestal OE-172 Antenna Pedestal Unit SA-1963 Antenna Safety Switch C-9947 Radar Set Control RT-1124 Receiver/Transmitter Plan Position Indicator (PPI)

Design Features. The SPS-55 was designed to be a solid state replacement for the SPS-10 surface search radar. It incorporates a low-noise, image-suppression mixer and features two slotted array antennas mounted back-to-back. One antenna is circularly polarized and the other is linear-horizontally polarized.

The transmitter and receiver hardware is housed in a single below-decks cabinet and the transmitter can be controlled in a sector radiation mode. The low-profile antenna minimizes installation space requirements.

Operational Characteristics. The ability to switch from horizontal to circular polarization allows the radar operators to compensate for high precipitation conditions. It was designed to detect both small surface targets and low-flying helicopters and aircraft. The system can detect small targets from ranges of less than 50 meters out to the radar horizon. In addition to being used for navigation and pilotage, the SPS-55 can help in the detection of submarines at snorkel and periscope depth.

Variants/Upgrades

SPS-502. The same basic modules can be used with a 4 to 6 GHz antenna to form an SPS-502 radar. There is 95 percent hardware commonality between the two systems.

Type 5544 Sea-Air Search Radar Suite. This is marketed as a combination of the TPS-44 search radar in

combination with an SPS-55 and one or more Cardion CRD-5544 color displays. Each radar feeds a slot extractor with the outputs sent to a single tactical display console or consoles.

Program Review

Background. The Navy saw the need for a new surface search radar during the late 1960s. The SPS-10 had been in service since 1953, and there had been many advances in naval electronics since its inception. The SPS-10 operated in the same frequency band as the US Navy's missile target tracking radars, the SPG-49, SPG-51, and SPG-55.

To reduce interference problems, the Navy issued a requirement for a new solid state surface search radar. Raytheon began developing the system; but in 1971 the first production contract went to Cardion Electronics. The first US warship equipped with the SPS-55 was the destroyer *Spruance* (DD-963).

During FY80, the SPS-55 underwent antenna improvement field changes. The project produced operational and reliability improvements for increased anti-air capabilities. Development of the antenna field changes were completed in FY81 and land-based testing completed in FY82.

Cardion Electronics was awarded a contract for procurement of 21 SPS-55 radars in FY82. This contract covered procurement for most of the CG-47 Ticonderoga class cruisers, the last US warship class that would be equipped with the radar.

SPS-55 improvement work within PE#64508N was completed in FY82. The primary emphasis of the SPS-55 program then shifted to procurement for Australian and Spanish FFG-7s beginning in FY83. The US Navy commissioned the last SPS-55-equipped ship in 1993 and does not plan to order any more ships equipped with the radar, since the SPS-67 is replacing it as the common surface search radar.

Cardion Electronics announced on March 22, 1990 that it had received a US\$2 million contract to provide radar antenna modification kits to standardize the antennas and add an IFF capability to the SPS-55.

In February 1995, the Navy announced that it was going to embark on a two-year product improvement program, not specifying what work would be required. In June of 1995, the Navy announced plans to hold a competition between Cardion Systems and Diagnostic/Retrieval Systems for a two year services and requirements contract for SPS-55 radars. A similar competition would be held between Diagnostic/Retrieval and Northrop Grumman

(Westinghouse Norden Systems) for the SPS-67. The effort would include conducting special studies, surveys, evaluations, and tests to determine the feasibility of proposed equipment changes to the radar.

In October, contracts for US\$8,000,000 and US-\$80,000,000 were awarded to Diagnostic/Retrieval Systems for line items of effort to be specified later. The contracts included work on both the SPS-55 and SPS-67.

Funding

Funding is from ship-building and Operations & Maintenance accounts.

Analysis. The SPS-55 has been a reliable system; but the SPS-67 has become the radar of choice for new ships. The Navy ended SPS-55 improvement efforts within the SPS Improvement Program. Further upgrades will be improvements such as the recent antenna IFF modification kits procured by the Navy.

Tactically and operationally the system does not call for significant spending for major operational enhancements. Most upgrades will probably focus on component

reliability and general maintainability improvements, as well as some technology insertion.

The SPS-55 should support a long and healthy spares and repair parts market. The last ships equipped with this system entered service in 1993, and no SPS-55- equipped ship has had more than 12 years of service. There should be at least 50 US warships equipped with this system in 2015, and the last CG-47 is not expected to leave service until 2028. There is no advantage to a mass replacement of SPS-55s with SPS- 67s.

Recent Contracts

There are no recent contracts over US\$5 million listed.

Timetable

FY71	First production contract
FY78	Developmental/Operational testing, SPS improvement project complete
FY80	Interference suppressor development complete
1993	Last SPS-55-equipped ship enters service

Worldwide Distribution

Australia. The Royal Australian Navy has six SPS- 55s on its FFG-7 guided missile destroyers.

Spain. The Royal Spanish Navy has five SPS-55s for its FFG-7 fleet.

Forecast Rationale

Most of the ships equipped with the SPS-55 will remain in active service well into the next century. There should be a healthy spares and repairs market through 2020. But

because of the reliability and makeup of the radar, this will not be a big-dollar market.

Ten-Year Outlook

No significant future production is expected.

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