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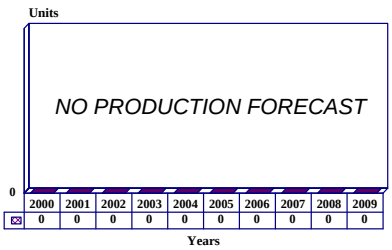
SYS-2(V) - Archived 12/2001

Outlook

- No new production has been detected since 1998
- Further orders are unlikely
- Barring any unexpected future activity, this report will be archived in 2001

10 Year Unit Production Forecast
2000-2009



Orientation

Description. Integrated Automatic Detection and Tracking (IADT) system for surface ships.

Sponsor

US Navy
Naval Sea Systems Command (NAVSEA)
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Arlington, Virginia (VA) 22242-5160
USA
Tel: +1 703 746 3100

Contractors

Northrop Grumman
Northrop Grumman Norden Systems
PO Box 5300 M/S C121
Norwalk, Connecticut (CT) 06856-5300
Tel: +1 203 852 7884
Fax: +1 203 852 7858
Web site: www.northrop-grumman.com
(Prime Producer)

Status. In service.

Total Produced. An estimated 72 systems had been produced through the end of 2000.

Application. The SYS-2(V) utilizes the UYK-44 computer and is integrated with radar systems to provide an IADT capability to such surface ships as Lutjens class destroyers, FFG-7 Oliver Hazard Perry class frigates, LHD Wasp class amphibious assault ships, CG/CGN class cruisers and DDG-993 Kidd class destroyers as part of the New Threat Upgrade (NTU) program, and Cheng Kung class frigates.

Price Range. The 1990 FMS contract, worth US$11.74 million for 19 systems, suggests a unit price of about US$615,000.

Technical Data

Design Features. The Integrated Automatic Detection and Tracking (IADT) set yields a single, unduplicated, accurate radar picture, taking advantage of the mutually supporting aspects of both two-dimensional SPS-49(V) and three-dimensional SPS-48(V) air search radar. The signal processing capability of the sets provides a computer-generated video display, sensitivity control, directed elevation scan, and logic commands. Both sets interface with, and provide accurate target tracking data to, the Tactical Data System and Weapon Direction System for threat assessment and weapon designation.

The SYS-2(V) is derived from Norden's earlier SYS-1 system, which was designed to be integrated with the SPS-40 and SPS-52C radar and the UYK-20(V) computer aboard Adams class destroyers. The SYS-2(V) utilizes the more advanced UYK-44 computer and is integrated with the SPS-49(V)5 and SPS-48E radar.

Operational Characteristics. By combining incoming signals from the radar into a single track that is continually updated, the SYS-2 significantly speeds a ship's response time in anti-air warfare. It is also useful when surface targets are addressed; within seconds, the system provides organized, simplified, and accurate data to the vessel's target detection and weapon delivery systems. Because the system assumes most of the workload for the automatic detection and tracking of enemy targets, it lowers the risk of operator fatigue and error in a crisis.

Automatic detection results in fewer undetected contacts, and automatic tracking shortens reaction time by providing fire control radar with accurate target information, even when coming up against hostile electronic countermeasures (ECM), clutter, or bad weather. When encountering these kinds of conditions, any single radar is likely to produce gaps in its tracking. The advantage of the SYS-2 is that it is able to combine inputs from long-range, short-range and 3D radar to provide a unified, reliable, and continuous picture of the air environment.

Variants/Upgrades

SYS-2(V)1. This version was added to Lutjens class destroyers as an upgrade.

SYS-2(V)2. This version equips the FFG-7 Perry class frigates as part of a modernization program to upgrade their air defense capability. It is also carried aboard Taiwan's Cheng Kung class frigates.

SYS-2(V)3. This version is carried on the LHD-1 Wasp class amphibious assault ships.

(**Note:** Details regarding how these variants differ from each other could not be determined.)

Program Review

Background. Development of the SYS-1, the SYS-2 predecessor, began in the mid-1970s for the US Navy's DDG-2 Adams class missile destroyer modernization program. The DDG-2s were equipped with SPS-40 and SPS-52C radar as primary sensors. Land tests were initiated in the fall of 1977 followed by sea trials into September 1978. The SYS-1(V) entered production in the early 1980s.

Only three Adams class destroyers were fitted with the SYS-1: DDG-19 Tatnall (1981), DDG-20 Goldsborough (1983-1984), and DDG-22 Benjamin Stoddert (1984-1985).

The SYS-2(V) equipped the WASP class amphibious assault ship (LHD), CG/CGN class cruisers and DDG-993 Kidd class destroyers as part of the New Threat Upgrade (NTU) program, which concluded in 1992. Among the vessels designated to receive the NTU were 21 Terrier missile-equipped ships of the CG-16 (9) and CG-26 (9) classes, and the CGN-25, CGN-35, and DDG-42 classes (one each); and a total of 10 Tartar missile-equipped ships, the CGN-36 (2), CGN-38 (4) and DDG-993 Kidd classes (4).

The US Navy initiated a modernization program for its FFG-7 Oliver Hazard Perry class frigates in 1990 that included adding the SYS-2(V)2 as part of an upgrade mix. A total of 12 ships in the class received the system.

A *Commerce Business Daily* notice dated March 26, 1992, stating that Norden (since acquired by Northrop Grumman) would receive a contract for four SYS-2 systems pending approval never resulted in a verifiable award. The same is true for a June 26, 1995, *CBD* notice: NAVSEA intended to issue orders on multiple occasions for a two-year period against basic ordering agreement N00024-95-5623 with Westinghouse Norden Systems for engineering services and support for the SYS-2(V), but no subsequent contract could be identified.

The Taiwanese Cheng Kung class (Kwang Hua project, PFG-2 Batch 1) Guided Missile Patrol frigate program, based on the FFG-7, carries the SYS-2(V)2. The first ship of this class was launched in October 1991. A total of seven were built through 1997. New ships built from Chi Kuang (the third of the class, launched in 1993) onward were designated to incorporate the SYS-2(V)2, with retrofits outfitting the first two. This effort is assumed to have been completed in 1997.

An additional WASP class ship may be built by the year 2005. The US Senate's fiscal year 1999 Defense Authorization bill included a US$50 million downpayment toward a US$1.5 billion amphibious assault ship. Although the US Navy did not request this ship and it has not yet been decided whether a Tarawa or WASP class ship will be built, the US Senate is pressing for the latter. If the WASP class ship is built, the installation of the SYS-2(V) is not secured. New technology, like that of the Cooperative Engagement Capability (CEC) program, may be employed.

Funding

None identified within current US government funding documents.

Recent Contracts

No contracts have been identified since the following:

Contractor	Award ($ millions)	Date/Description
Norden Systems	11.7	Aug 1990 – FFP contract for 19 SYS-2(V) IADT systems for various ship classes. Includes purchases for the US Navy (47.07%), Taiwan (48.26%) and West Germany (4.67%) under the FMS program. Completed Dec 1993. (N00024-90-C-5639)
Norden Systems	7.9	Jul 1991 – FFP contract for materials and services for 12 SYS-2(V) radar. Completed Dec 1994. (N00024-90-C-5639)

Timetable

Month	Year	Major Development
	1981	SYS-1 fitted to first destroyer
	1985	Development of an IADT capability for FFG-7 class ships and integration of surface search radar into IADT systems; continued development of IADT capability for CV/CVN ship classes explored
	1988	Investigation into the development of IADT capability for remaining ship classes (e.g., DD-963), initiated, including integration of Target Acquisition System (TAS) Mk 23 with IADT
	1992	New Threat Upgrade program (featuring SYS-2) completed
	1993	Integration testing of SYS-2 IADT/Auto ID in CV/CVN classes
Mar	1994	Westinghouse purchases Norden from United Technologies
Early	1996	Northrop Grumman acquires Norden from Westinghouse
May	1997	Last of Cheng Kung class (PFG-2 Batch 1) ships launched
Late	1999	Launch date of seventh LHD-1 Wasp class ship
	1998	Senate makes a down payment on an amphibious assault ship with strong recommendations for an additional LHD Wasp class ship

Worldwide Distribution

The SYS-2 has been delivered to **Taiwan** (Cheng Kung class frigate construction program), **Germany** (Lutjens class destroyer upgrade), **Greece** (DDG-993 Kidd class destroyers) and the **United States** (New Threat Upgrade program, FFG-7 class frigates, LHD-1 class amphibious assault ships).

Forecast Rationale

The SYS-2 Integrated Automated Detection and Tacking (IADT) system is a computer-based radar data processor with automated radar detection, tracking and correlation capabilities developed by Northrop Grumman. Designed to enhance combat systems, it utilizes short- and long-range radar to provide earlier detection of targets, improve threat assessment and reduce reaction time. In order to produce a single unduplicated, highly accurate, surveillance image, the SYS-2 combines 2D and 3D contact data from air search radar such as the SPS-49(V) and SPS-48(V).

Development of the SYS-2's predecessor, the SYS-1, began in the mid-1970s. By the mid-1980s three Adam class destroyers had been fitted with the SYS-1. As a part of the New Threat Upgrade (NTU) program, the SYS-2 was installed in several CG/CGN class cruisers and DDG-993 Kidd class destroyers. This program was completed in 1992. Additionally, the US Navy included the SYS-2 as a part of an upgrade for 12 FFG-7 Oliver Hazard Perry class frigates in 1990. Under a 1990 Foreign Military Sales contract, nine systems for Taiwan and one system for Germany were ordered. As of the year 2000, Taiwan has seven Cheng Kung class frigates, the Taiwanese platform for the SYS-2.

Although the SYS-2(V) remains in service, no recent procurement activity has been detected. Furthermore, new technologies, such as that of the Cooperative Engagement Capability (CEC) program, will most likely replace the SYS-2(V). No further acquisitions of the SYS-2(V) are foreseen.

Ten-Year Outlook

No SYS-2(V) production is forecast at this time. This report will be archived next year, 2001.

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