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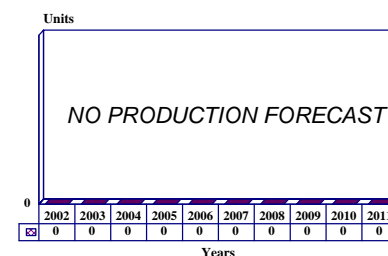
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SHINPADS - Archived 08/2003

Outlook

- Forecast International projects no further production of the Shipboard Integrated Processing and Display System
- Barring developments, Forecast International will archive this report in 2003

10 Year Unit Production Forecast
2002 - 2011



Orientation

Description. The Shipboard Integrated Processing and Display System (SHINPADS) is the Canadian Navy's combat management system. SHINPADS provides radar surveillance, target tracking, threat evaluation, weapons assignment, kill assessment, and tactical navigation.

Sponsor

Ministry of Supply and Services
Place du Portage
Hull PQ
Ontario K1A 0S5
Canada

Contractors

Lockheed Martin Corporation
Lockheed Martin Canada
3001 Solandt Road
Ottawa (Kanata), Ontario, Canada, K2K 2M8
Web site: <http://www.lockheedmartin.com/canada>

Status. In service.

Total Produced. Sixteen Shipboard Integrated Processing and Display Systems are estimated to have been produced.

Application. To provide command, control, and navigation for Canadian warships.

Price Range. The price of a single Shipboard Integrated Processing and Display System is approximately US\$16.5 million.

Technical Data

Design Features. The Shipboard Integrated Processing and Display System uses a network of 18 UYK-20 computers. The computers are linked by the UYC-501(V) SHINPADS Serial Data Bus (SDB). The SDB includes a bus transmission system, a bus interface

set, and real-time software for implementing distributed computing networks. The bus transmission system consists of main bus triaxial-cored copper cables, bus access modules (BAM), and stub cables. The BAM

passively taps into the main cable and supports four users, with the stub cables providing the connections.

A standard SHINPADS message block consists of 254 16-bit words. If necessary, a special block mode permits the transmission of much longer messages. Messages are sent in broadcast mode through the entire databus system. Messages are addressed so that each user can pick the users relevant to that particular function. This eliminates the need for retransmission when messages are intended for a number of users. There is also a point-to-point signal mode in which a message can be sent to a single specified user.

Operational Characteristics. The Shipboard Integrated Processing and Display System has a total of 18 operator workstations. Their functions and responsibilities are as follows.

Commanding Officer (CO). Tasked with operational overview, mission allocation, and tactical deployment of the ship.

Operations Room Officer (ORO). Tactical coordination of the ship and control of sensors and weapons systems. Console provides facilities for assessing the tactical picture and assigning functional priorities.

Sensor Weapons Controller (SWC). Controls the specific operation of the ship's weapons and sensors as directed by the ORO. The SWC normally retains control of above-water operations and delegates ASW to an assistant.

Assistant Sensor Weapons Controller (ASWC). Assists the SWC and performs the operational tasks delegated to him or her.

Anti-Submarine Air Controller (ASAC). Controls the operation of all fighter, attack, and ASW aircraft assigned to support the ship in prosecuting the action.

Track Supervisor (TS). Supervises the operations of the sensor operators and selects the air and surface track information for transmission via datalink, as applicable.

Radar Tracker 1 (RT1). Monitors and ensures optimum performance of the SPS-49 radar and the associated Identification Friend or Foe (IFF) equipment.

Radar Tracker 2 (RT2). Monitors and ensures the optimum performance of the Sea Giraffe radar and the associated IFF equipment.

Electronic Warfare Supervisor (EWS). Selects electronic support measures (ESM) information for transmission by Link 11 and by tactical voice reporting net. It then enters the data into the tactical command system, activates onboard electronic countermeasures (ECM) equipment, launches chaff/IR decoys as ordered by the SWC/ORO, and monitors changes in EMCON (Emanation Control) policy.

Electronic Support Measures (ESM). Operates the CANEWS (Canadian EWS) ESM system and coordinates that equipment with the EWS and other operators. Operates the RAMSES jammers. Feeds targeting data to the fire control systems.

Communications Intercept System (CIS). Operates communications intercept systems and relays data so obtained.

Sonar Control Supervisor (SCS). Selects subsurface surveillance information for transmission, alerts SWC/ASWC/ASAC of sonar data, enters sonar targeting data into the command system, and relays such data to the AAW sections.

Hull-Mounted Sonar (HMS). Operates the SQS-505(V)6 bow-mounted sonar and the SQR-19(V) towed array sonar. It also alerts the SCS of contacts, enters contact information to the command control system, and identifies such contacts.

Sonobuoy Processing System. Processes the data obtained from air-dropped sonobuoys and coordinates it with other sensor systems.

Separate Tracking and Illuminating Radar (STIR). Operates the fire control radars and monitors engagements.

Variants/Upgrades

No variants or upgrades are known to exist. The Shipboard Integrated Processing and Display System does include a built-in provision for upgrades.

Program Review

Background. In the early 1970s, the Canadian government conducted a study of alternative architectures for combat systems. The study found that the rapidly declining cost of computer hardware had made the

concept of a single central processing computer obsolete.

In response to the study, the SHINPADS program was initiated in 1974. The aim of the SHINPADS program was to create a combat management system where all users would have access to a database and all consoles would be fully interchangeable. The SHINPADS design concept was progressively refined during the late 1970s and early 1980s.

During the late 1980s, the Canadian government decided the Shipboard Integrated Processing and Display System would initially be installed on the reconstructed Iroquois class destroyers. The original plan was for the Iroquois installations to act as a trial for the later installations on the Canadian Patrol Frigates (now the Halifax class). However, long delays in the Iroquois upgrade program (TRUMP) resulted in the Patrol Frigates becoming the trial ships for the SHINPADS program. This caused a series of

significant delays in the service entry of the HMCS *Halifax*, which was equipped with the Shipboard Integrated Processing and Display System.

In 1991, the SHINPADS trial program was finally completed on the HMCS *Halifax*. At that time, approximately 75 percent of the SHINPADS software had been verified. In December 1992, the fully verified and debugged SHINPADS software was installed on the HMCS *Vancouver*. After service trials had been successfully completed, the software was then added to the *Halifax* and all subsequent ships of the class.

Latest Information. Sixteen Shipboard Integrated Processing and Display Systems were acquired by the Canadian government through 1996. No new contracts have been awarded for additional purchases of the system.

Funding

The Shipboard Integrated Processing and Display System was developed under a Canadian MoD contract.

Recent Contracts

No recent contracts have been awarded for the Shipboard Integrated Processing and Display System.

Timetable

<u>Year</u>	<u>Major Development</u>
1974	Shipboard Integrated Processing and Display System program initiated
1983	First order for SHINPADS placed for Canadian patrol frigates
1987	Second order for SHINPADS placed for Canadian patrol frigates
1990	HMCS <i>Halifax</i> begins SHINPADS trial program
1991	HMCS <i>Halifax</i> completes SHINPADS trial program
1992	SHINPADS software fully verified and debugged

Worldwide Distribution

The Shipboard Integrated Processing and Display System is the **Canadian Navy's** combat management system.

Forecast Rationale

The Shipboard Integrated Processing and Display System (SHINPADS) is the Canadian Navy's combat management system. SHINPADS provides radar surveillance, target tracking, threat evaluation, weapons assignment, kill assessment, and tactical navigation.

SHINPADS provides exceptional reliability and survivability by supporting up to six main bus channels. Each bus channel is identical yet physically separate. During normal operation, two channels are used: a control channel and a data channel. The remaining

channels are effectively dormant, except for configuration monitoring.

To date, 16 Shipboard Integrated Processing and Display Systems have been produced. SHINPADS was last acquired by the Canadian government in 1996. Production of SHINPADS now appears to have come to a close. No new procurement contracts have been awarded for SHINPADS. Therefore, Forecast International projects *no further production of the Shipboard Integrated Processing and Display System.*

Consequently, the ten-year forecast chart has been omitted.

Barring further developments, Forecast International will archive this report in 2003.

Ten-Year Outlook

No additional production of the Shipboard Integrated Processing and Display System is expected. Consequently, the ten-year forecast chart has been omitted.

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