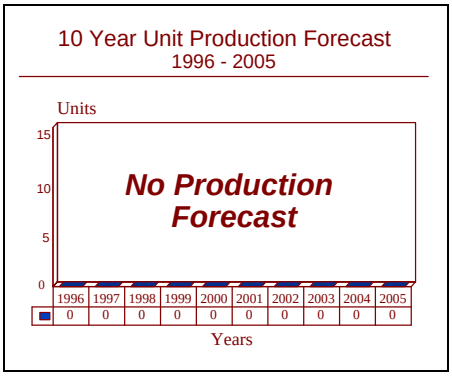
SQS-26 - Archived 9/97

Outlook

- System is operational, but slowly being phased out of the US Navy.
- Phased out US Navy SQS-26s will be sold to various world navies that buy old US warships.



Orientation

Description. Low-frequency, bow-mounted, surface ship anti-submarine sonar.

Sponsor

US Navy
Naval Sea Systems Command
Arlington, Virginia (VA)
USA

Contractors

BF Goodrich Aerospace
Engineered Polymer Products Division
6061 BF Goodrich Blvd
Blount Island
Jacksonville, Florida (FL)
USA
Tel: +1 904 757 3660
Fax: +1 904 757 7116
(Sonar rubber domes and windows)

EDO Corp
Defense Systems Division
14-04 111th Street
College Point, New York (NY) 11356-1434
USA
Tel: +1 718 321 4000
Fax: +1 718 939 0119
(Production, SQS-26BX)

Lockheed Martin Corp
Ocean Radar & Sensor Systems Division
525 French Road
Utica, New York (NY) 13502
USA
Tel: +1 315 793 7000
Fax: +1 315 793 7711
(Production, SQS-26AX/CX)

Raytheon Co
Microwave & Power Tube Division
465 Centre Street
Quincy, Massachusetts (MA) 02169-7530
Tel: +1 617 984 8400
(SQS-26CX electron tubes)

Status. In service.

Total Produced. The total of SQS-26s estimated to be available for overall active service is 33 systems worldwide as of January 1996.

Platform. The SQS-26 is operational aboard Garcia class frigates, Knox class frigates, and California class cruisers.

Application. The SQS-26 is designed for the long-range detection and tracking of hostile submarines.

Price Range. No reasonable price range is available as this system has been out of production for some time.

Technical Data

Characteristics

Frequencies:	3.05 - 4.5 kHz
Power:	192 kW
Range:	20,000 yd (approximate, direct path)
Transmission modes:	three

Design Features. The SQS-26 uses direct path (surface duct), bottom-bounce, or convergence zone transmissions. It is widely held to be the most powerful sonar in Western service, after the SQS-53. It has been credited with direct path ranges of about 20,000 yds, and bottom-bounce and convergence zone ranges of nearly 70,000 yds. The SQS-26 has active transmission frequencies of 3.05 to 4.5 kHz, and passive detection frequencies as low as 1.5 kHz. The operating modes include omnidirectional, rotating directional and point directional transmission. The system runs on 192 kHz and 100 kW power. The transducer is 5.5 ft high, 16 ft in diameter and weighs 60,000 lbs. The SQS-26 has a dome-enclosed array with over 500 staves and 37 cabinets of signal processing, transmitting, and display equipment.

Variants/Upgrades

The SQS-26 is a high-performance, bow-mounted sonar which provides long range submarine detection, classification, localization, and tracking. Both General Electric and EDO were involved in SQS-26 production. General Electric produced the SQS-26AX and SQS-26CX, while EDO contributed the intermediary SQS-26BX. The SQS-26AX and BX versions are basically the same with the major changes appearing in the CX version.

The Navy has conducted several projects to upgrade the SQS-26. The last project, which ended in FY84, was PE 25623N, Project S1637 SQS-26 Improvements. Initial efforts developed an improved passive broadband capability, including better bearing accuracy and tracking capability. An improved SQS-26CX, with solid state electronics and a digital interface to the Mk 116 fire control system, was reclassified the SQS-53 (see separate report).

Program Review

Background. The US Navy began feasibility studies for the SQS-26 in 1955. The advent of nuclear-powered submarines necessitated the development of high-powered sonars able to track fast submarines. The Navy gave General Electric and EDO development contracts. The earliest versions of the SQS-26, the Edo XN-1 and the General Electric XN-2, were installed aboard the destroyers USS *Willis Lee* and USS *Wilkinson* in September and June 1961, respectively. Although the testing was not then complete, the Navy gave General Electric a contract for 12 SQS-26AX sonars that same year, and the first SQS-26AX sonars entered service in mid-1963 aboard the frigates USS *Bronstein* and USS *McCloy*.

In 1963 the Navy gave EDO a contract for 16 SQS-26BX sonars. While the BX was being developed, the Navy gave General Electric a contract to produce the SQS-26CX sonar in October 1964. The Navy and General Electric continued research and development, since the XN-2 was incapable of bottom bounce operation, which the Navy required of the new sonar. When these efforts proved successful, the Navy gave General Electric a contract in March 1965 to upgrade all SQS-26AX sonars to the SQS-26AXR model. The SQS-26BX entered service in 1966. Although many ships were equipped with the SQS-26, it was not fully approved for operational service until November 1968. The first ship equipped with the SQS-26CX, the frigate USS *Knox*, entered service in 1969.

Through 1979, SQS-26 funding came to over $146.8 million. Awards went to Louis Allis for power supplies; Booz-Allen for a follow-on program; Tracor for an interference reduction program; Philco-Ford for engineering services; Hazeltine for transducer elements; Systems Consultants for technical services; Hydrospace Challenger for SQS-26 modernization; Litton for engineering support; Honeywell for trainers; GE for production components, repairs, mod kits and services; and BF Goodrich for sonar domes and rubber acoustic windows.

Another aspect of the program was that it provided for the procurement of the redesigned Louis Allis power supply (LAPS) input inverter for the SQS-26. It also provided for the Sonar In-Site Mode Assessment System (SIMAS) for the SQS-26CX/53 systems and SQS-26BX sonar procurement. This equipment improved reliability, maintainability and performance, and long-range tracking.

One area of concentration was replacement of the ship's sonar dome steel acoustic window with a pressurized, wire-reinforced, rubber acoustic window, and installation of wide band transducer elements, although this was funded under a separate line. The Navy will not resume manufacture of this system because it has been replaced by the SQS-53.

NOTE: *A full report on the* **SQS-53** *sonar is available in the Anti-Submarine Warfare, AN Equipment, and Land & Sea-Based Electronics books.*

Funding

There is no further funding for the SQS-26 system in the budget. Operation and maintenance costs picked up through other existing programs.

Recent Contracts

Contractor	Award ($ millions)	Date/Description
BF Goodrich	10.4	Jul 1993 - FFP LTR CTRC for SQS-26 sonar rubber domes, SQS-26/53 sonar rubber dome rubber windows, and related pressure plates, cradles, and shipping and installation fixtures. This contract combines purchases for the US Navy (86%) and Taiwan (14%) under the FMS program. (N00024-93-C-6270)
BF Goodrich	10.6	Apr 1994 - FFP maximum priced contract for SQS-26/53 sonar rubber domes, transportation fixtures, SQS-26/53 sonar dome rubber windows, shipping and installation fixtures, installation services, and related technical services. N00024-94-C-6202)
BF Goodrich	10.3	Mar 1995 - Modification to previously awarded contract for SQS-56 sonar rubber domes, transportation fixtures, SQS-26/53 sonar dome rubber windows, and installation and technical services. Contract expected to be completed by January 1997. (N00024-94-C-6203)
BF Goodrich	7.7	March 1996 - Modification to previously awarded contract for seven AN/SQS-26/53 sonar dome rubber windows, seven shipping installation fixtures, and installation and technical services. Contract is expected to be completed by January 1997. (N00024-94-C-6203)

Timetable

	1955	Feasibility studies initiated
	1957	Development initiated
	1963	Prototype testing
		First SQS-26AX enters operational service
	1965	Evaluation completed
		Full production initiated
		GE awarded contracts for SQS-26AXR modification
Nov	1968	SQS-26 approved for service use
Jan	1975	Last SQS-26-equipped ship commissioned
	FY80	Limited procurement of SQS-26 spares & repairs
	FY83	SQS-26 Improvement initiated under PE 25623N
	FY84	Last year of funded PE 25623N efforts
	FY89/90	US Navy decommissions 16 SQS-26-equipped ships
	1988	Foreign navies show interest in SQS-26-equipped ships

Worldwide Distribution

Brazil:	4 ex-US Garcia class frigates (considered to be destroyers by the Brazilian Navy (SQS-26AXR)
Egypt:	2 ex-US Knox class frigates (SQS-26CX)
Greece:	3 ex-US Knox class frigates (SQS-26CX)
Taiwan:	6 (+6) ex-US Knox Class frigates (SQS- 26CX)
Turkey:	8 ex-US Knox class frigates (SQS- 26CX)
US:	2 (CGN) California class cruisers (SQS-26CX) 8 Knox class frigates (decommissioned and available for transfer) (SQS-26CX)
Source:	*Jane's Fighting Ships 1995-96*

Forecast Rationale

Although the SQS-26CX is a highly capable sonar, it uses outmoded electronic technology dating from the mid 1960s. By present standards, the SQS-26CX has poor performance in bad environmental conditions and is difficult to maintain due to the need for numerous complex system adjustments. Major SQS-26 improvement efforts have incorporated much higher power, greater reliability, and the use of a rubber rather than a steel dome. (Rubber allows greater sonar conductivity than steel). These improvements have helped this sonar to cope with the greater hostile submarine threat and have, to some extent, countered the problems inherent in the installed analog circuits and replaced hardware that is rapidly approaching obsolescence. The SQS-26 is no longer in production and the only orders are for repair and spare parts. It has been replaced on newer class ships by the SQS-53 which is an upgraded version of this system.

The US Navy is accelerating the decommissioning of its oldest surface combatants, as well as other classes of vessels. This will speed up the transferring or scrapping of the remaining SQS-26-equipped frigates and cruisers. Most of the Navy's SQS-26-equipped Garcia class (FF 1040) and Brooke class (FFG 1) frigates were transferred to the Pakistani and Brazilian Navies. Several Knox class (FF-1052) frigates have been transferred to Taiwan, Greece and Turkey.

Ten-Year Outlook

No production is forecast.

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