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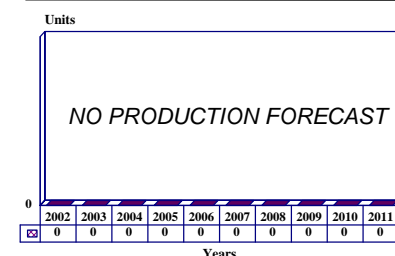
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DA.08 – Archived 02/2003

Outlook

- Bangladesh receives DA.08 equipped frigate in 2001
- Many DA.08 being replaced with modern 3D radar systems
- Little activity detected since the mid-1990s

10 Year Unit Production Forecast
2002 - 2011



Orientation

Description. F-band 2D naval radar tasked with medium- to long-range air and surface surveillance.

Sponsor

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Licensee. No known production licenses have been awarded.

Status. In service.

Total Produced. An estimated 58 radar had been delivered through 2001.

Application. Designed to act as a medium- to long-range air and surface surveillance radar. Similar to other radar of this type, DA.08 allocates targets to weapon control radar.

Platform. The DA.08 was originally intended for deployment on major warships, including aircraft carriers, cruisers, and destroyers. It is now being used in smaller combatants such as frigates and corvettes.

Price Range. A unit cost of US\$6 million has been estimated for the DA.08, based on known prices for the similar US system, SPS-40.

Technical Data

	<u>Metric</u>	<u>US</u>
Characteristics		
Range		
Air targets		
(MTI version):	193 km	104.2 nm
(FFT version):	146 km	79 nm
Surface targets:	1.5 km – horizon	0.8 nm – horizon
Azimuth resolution:	1.55 degrees	
Range resolution:	120 m	150 yards
Antenna		
Type:	Horn fed parabolic reflector	
Rotational speed – MTI:	10 to 20 rpm	
– FFT:	15 rpm	
Weight:	1,100 kg	2,423 lb
Transmitter		
Frequency:	F-band (3-4 GHz)	
Peak pulse power:	145 kW	
Mean power:	5 kW	

Design Features. Although several versions of the DA.08 radar are available, the whole series is substantially similar. There are, however, two fundamentally different versions of the DA.08, based on their pulse configuration. A dual-beam Moving Target Indicator (MTI) version is offered mainly for long-range air and surface surveillance, and target indication. A single-beam Fast Fourier Transform (FFT) version is offered mainly for medium-range operations. The dual-beam version's antenna comprises two feedhorns – one for the active main beam and the other for the passive high beam.

The DA.08 is a high-power, pulse-to-pulse coherent radar. Each pulse consists of a one-microsecond non-modulated pulse and a 34 or 68 microsecond frequency-swept (pulse compression) pulse. The antenna is stabilized for naval use, either hydraulically (LS designations) or electro-mechanically (S designations). LS types feature the lower masthead weight, which is advantageous for small-vessel deployment. The radar can use either a single or dual antenna feed, indicated by the use of a 1 or 2 before the S or LS suffixes.

The antenna is mounted on a lightweight, hydraulically stabilized platform, resulting in substantial reduction of top weight.

Operational Characteristics. Due to the antenna's low side-lobe level, the radar's performance in an electronic countermeasures environment is remarkably high. ECCM (electronic counter-countermeasure) capabilities are incorporated. A high mean-power TWT transmitter ensures good range performance and frequency flexibility. The radar is able to suppress a large amount of existing clutter because of its stabilization system, dual-beam antenna, dual receiver with a high dynamic range, circular polarization, and the MTI or FFT processing.

The DA.08 series can be supplied with integrated Identification Friend or Foe (IFF) by Cossor, or other client-nominated suppliers. The single-feed DA.08/1 systems have a shorter range than the dual-feed DA.08/2 variants. The DA.08 series also has such features as high resolution and frequency agility, and is equipped with both digital video processing with Built-In Test Equipment (BITE) and monitoring facilities.

Automatic target tracking can be performed by the MTI version by incorporating an optional video extractor, covering up to 64 air and surface targets. On the FFT version, automatic tracking can manage up to 110 air and 30 surface targets without an additional video extractor.

Variants/Upgrades

Variant DA.08 Designations. The following variants of the DA.08 have been identified: DA.08/A, DA.08/1S, DA.08/2S, DA.08/1LS, and DA.08/2LS. The DA.08

family of radar is in the process of being replaced by the Smart/MW.08 3D system.

SPQ-50. Canadian designation for the DA.08.

Program Review

Background. Developed in the 1970s, the DA.08 is a 2D high-power, pulse-to-pulse coherent, F-band surveillance radar system. With sales worldwide, this system, developed by Signaal of the Netherlands (now Thales Nederland), has had a successful production run.

Argentina, one of its first customers in the 1970s, ordered the DA.08 to complement the LW.08 system aboard the aircraft carrier ARA *Veinticinco de Mayo*. In 1980, Argentina once again ordered the DA.08 radar for its MEKO 360 frigates, four of which are now in service. Germany, another early customer in the late 1970s, ordered DA.08 radar systems for its Bremen class frigates. The Bremen design is based on the Dutch Kortenaer class, and eight of these vessels are still in service. Sales continued in 1983, when Malaysia ordered two DA.08 radar systems for its Type FS-1500 frigates. Other DA.08 sales have also been made to Canada, as part of the Tribal class upgrade program, and to Portugal as the primary air-search radar for its MEKO class frigates.

Turkey joined Signaal's customer list when it selected the DA.08 radar as equipment for its new MEKO 200 frigates. Germany furthered its inventory of the DA.08 radar by installing them on its new F-123 Deutschland class frigates now in service with the German Navy and the Portuguese Navy's Vasco da Gama class. The Greek Navy also equipped its four new MEKO 200 frigates with the DA.08. These radar systems were produced by Magnavox-Signaal of the US and delivered through FMS channels.

In 1991, the DA.08 was purchased by two new customers. It was procured as part of the sensor fit for the Korean KDX destroyers and a Brazilian Navy upgrade package for the Niteroi class frigates. A year later, the DA.08 radar was specified as the primary surveillance sensor for the two frigates being built by Yarrow for the Malaysian Navy.

A major order for the DA.08 was awarded in late 1994 by the Pakistani Navy. The purchase was for the upgrade of six British Type 21 Amazon class frigates, which were declared surplus by the Royal Navy and sold to Pakistan for approximately US\$15 million each.

The end of the DA.08 radar system's production was marked by the German Navy's decision to replace the DA.08 on its Bremen class frigates (Type F122) with more modern 3D systems. The DA.08's technology has become outdated, and its manufacturer, Signaal, has been promoting more advanced systems such as its Smart-L 3D long-range surveillance radar.

There has been, however, some activity for the DA.08 radar system. On four ex-US Gearing Fram class destroyers acquired by South Korea, the obsolete US Mk 29 radars were replaced by Signaal's DA-08 during the mid-1990s. Also, Bangladesh took delivery of its newest frigate, the BNS Bangabandhu, in 2001. Built by Daewoo Shipbuilding of South Korea, this 2,300 ton frigate is equipped with a Thales Nederland DA.08 surveillance radar.

Funding

The DA.08 radar was developed using company funding.

Recent Contracts

No specific contracts have been identified for the DA.08 radar since 1994. However, reports of four systems being installed on Korean owned ex-US Gearing Fram class destroyers, and the delivery of a DA.08 equipped frigate to Bangladesh, indicate that production for the DA.08 is still active.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1989	Ordered by Greece for MEKO 200 frigates
Mar	1992	Ordered by Malaysia for two frigates
Oct	1994	Ordered by Pakistan for Type 21 frigates
Nov	1997	Germany begins replacement of DA.08 with DASA TRS-3D/32 radars
	mid-1990s	Four ex-US Gearing Fram class destroyers acquired by South Korea receive DA-08
	2001	Bangladesh accepts delivery of DA.08 equipped frigate

Worldwide Distribution

Argentina. One system was on ARA *Veinticinco de Mayo* aircraft carrier, which has since been decommissioned and sold for scrap; four on Almirante Brown destroyers

Bangladesh. One on the BNS Bangabandhu frigate

Canada. Four systems on Iroquois class destroyers

Germany. Eight were on Bremen class frigates (replaced with DASA TRS-3D/32), four on Brandenburg frigates

Greece. Four on MEKO 200MK3 frigates

Korea. Four DA.08 radars on four ex-US Gearing Fram I class destroyers

Malaysia. Two on Leikui class frigates; two on Kasturi corvettes

Netherlands. Two systems on Heemskerck frigates (subsequently replaced with Signaal LW.08)

Pakistan. Six systems on Type 21 frigates

Peru. One system on De Ruyter class CG

Portugal. Three systems on Vasco da Gama class frigates

Taiwan. Seven DA.08 radars with DA.05 antenna on Wu Chin III destroyers

Turkey. Four systems on Yavuz frigates, plus one on frigate *Gemlik*

Forecast Rationale

Operating in the F-band, the Thales Netherlands DA.08 is a medium- to long-range radar system, designed to provide medium- to large-class vessels with early warning against all types of threats, as well as target indication for weapons control systems.

For almost two decades, the DA.08 radar system has been competitive on the international market. Since the 1970s the DA.08 has captured sales in at least 13 countries. As with most systems, time has been the DA.08's enemy. More modern 3D systems with increased capabilities are beginning to replace older 2D systems like the DA.08. Germany, for example,

replaced its DA.08 radar systems with the TRS-3D/32 G-band surveillance and target acquisition radar.

Very little activity for the DA.08 has been detected since the mid-1990s. The only known system to be delivered since the mid-1990s is a DA.08 fitted to a new Bangladeshi frigate in 2001. With the availability of more technologically advanced 3D radar systems, most modern militaries are likely to bypass the DA.08 radar system. Although there is a chance that a less affluent navy will purchase the DA.08 radar system, it is more likely that these countries will salvage one of the many systems being replaced with a 3D system. No further contracts or production are anticipated.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

Designation	Application	Thru 01	<u>High Confidence Level</u>				<u>Good Confidence Level</u>				<u>Speculative</u>		Total 02-11
			02	03	04	05	06	07	08	09	10	11	
DA.08	Prior Prod'n:	58	0	0	0	0	0	0	0	0	0	0	0