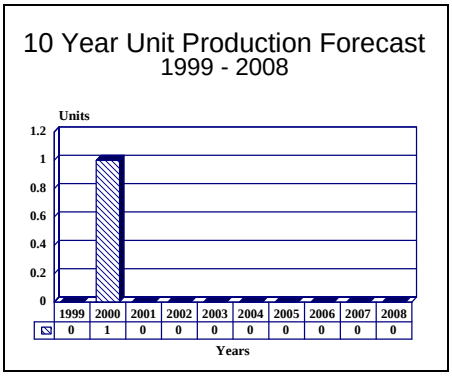
Signaal DA.08 - Archived 4/99

Outlook

- Being replaced by SMART on the market
- Technology dated and upgrade potential limited
- No known new orders or activities since 1994



Orientation

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

Sponsor

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The Netherlands
Tel: +31 74 488111
Telex: 44310

Ministry of Defense
Plein 4
PO Box 20701
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Contractors

Hollandse Signaalapparaten BV
PO Box 42
NL-7550 GD Hengelo Ov
The Netherlands
Tel: +31 74 488111
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(prime)

Cossor Electronics
The Pinnacles
Harlow
Essex CM19 5BB
United Kingdom
(produces the IFF where this is fitted)

Licensee. No known production licenses have awarded.

Status. In service, but most probably ceasing production after the last order is filled in 2000 for Greece.

Total Produced. An estimated 52 radars have been delivered through 1998.

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

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

	Metric	US
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. However, two fundamentally differing versions of the DA.08 are available, based on their pulse configuration. A dual-beam moving target indicator (MTI) version is offered mainly for long-range air and surface surveillance as well as target indication, and 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 lower masthead weight which is advantageous for small vessel deployment. The radar can either use 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. Thanks to the antenna's low side lobe level, the radar's performance in electronic countermeasures environment is remarkably high. ECCM 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 as well as the MTI or FFT processing.

The DA.08 series can be supplied with integrated 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. Other features of the DA.08 series include high resolution, frequency agility, 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 the DA.08/2LS. The DA.08 family of radars is in the process of being replaced by the Smart/MW.08 3-D system.

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

Program Review

Background. Argentina 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. In the late 1970s, Germany 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 now in service. In 1983, Malaysia ordered two DA.08 radar systems for its Type FS-1500 frigates. 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 their MEKO class frigates.

The Turkish navy selected the DA.08 radar as equipment for its new MEKO 200 type frigates. The DA.08 radars have also been installed on the 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 is also equipping its four new MEKO 200 frigates with the DA.08. These radars will be produced by Magnavox-Signaal of the US and delivered through FMS channels.

In 1991, the DA.08 was proposed as part of the sensor fit for the Korean KDX destroyers, under the terms of the BAeSema bid for the command system for those destroyers. Another part of this bid specified the Goalkeeper CIWS and, in early 1992, the purchase of Goalkeeper for these ships was announced. Since Goalkeeper is incompatible with the other system bid for KDX (the Cosys 200), this was taken as an indicator that the BAeSema bid would be the winner and the DA.08 would be ordered for these destroyers. The apparent award of this contract to STN Atlas Elektronik was, therefore, a total surprise, not least to the Korean navy. This matter was eventually resolved by awarding the contract to BAeSema consortium.

In March 1991, DA.08 was also offered to the Brazilian navy as part of an 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. These ships were scheduled for delivery in 1996.

A major order for the DA.08 was awarded in late 1994 by the Pakistani navy. That service has purchased the six surviving frigates of the British Type 21 Amazon class. These were declared surplus by the Royal Navy and were sold to Pakistan, in an as-laying condition, for approximately US$15 million each. This price reflected the poor equipment fit of the ships and their reportedly poor condition. The Pakistani navy immediately undertook the first phase of a multitiered upgrade program. This first was said to rectify the existing faults with the ships and bring them to a common standard.

The work involved replacing the existing, painfully obsolete, Type 992R radar with the Signaal DA.08, installing a new command system using CelsiusTech 9LV Mk.3 technology and replacing the existing UAA-1 ESM system with French equipment. Two twin Harpoon launchers and a Phalanx Mk.15 CIWS were also to be installed.

DA.08 radars are a medium-range E/F-band complement to the long-range D-band LW.08, which is heavier, more complex and more expensive. The DA.08s will continue to be sold, particularly in association with Blohm and Voss's MEKO-200 frigates and MEKO-140 corvettes. The market for corvettes and small frigates in the 1500-2000-ton size bracket is growing, largely at the expense of the missile-armed fast attack craft sector. The DA.08 is particularly well suited to the requirements of this type of warship.

Overall, the trend is toward the use of 3-D radars, particularly where there is a demand for area air warfare capability. The DA.08 exploits the many sectors of the export market in which the complexity and associated maintenance load of 3-D systems is undesirable and unaffordable. The DA.08 will continue to score in such areas where it will offer an acceptable air/surface search performance. When used in combination with the Signaal Smart or MW.08 radars, it provides a highly effective sensor system. This combination is proving to have considerable potential in the export market.

Funding

The DA.08 radar was developed using company funding.

Recent Contracts

No known contracts have been awarded for the Signaal DA.08 radar since 1994.

Timetable

Month	Year	Major Development
	1976	Ordered by Germany for Hamburg destroyers
	1979	Ordered by Germany for first three Bremen frigates
	1980	Ordered by Argentina for Brown destroyers
	1980	Ordered by Germany for second three Bremen frigates
	1983	Ordered by Malaysia for Kasturi frigates
	1985	Ordered by Peru for Almirante Grau cruiser
	1985	Ordered by Turkey for Yavuz frigates
	1986	Ordered by Germany for last two Bremen frigates
	1986	Ordered by Portugal for Vasco da Gama frigates
	1988	Ordered by Canada for Tribal destroyer upgrades
	1989	Taiwan revealed DA.08 fit on Gearing destroyers
	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

Worldwide Distribution

Argentina. One system on ARA *Veinticinco de Mayo* aircraft carrier; four on Almirante Brown destroyers
Canada. Four systems on Iroquois class destroyers
Germany. Eight on Bremen class frigates, four on Brandenburg frigates (Being replaced with DASA TRS-3D/32)
Greece. Four on MEKO 200HN frigates
Malaysia. Two on Leikiu 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

The Signaal DA.08 surveillance radar enjoyed a high level of success in the late 1980s and early 1990s. The system was installed on a wide variety of ships but centered mainly on the destroyer and frigate sized vessels. Many of these radars were installed as part of a modernization upgrade carried out by many smaller nations as opposed to being procured for new build use.

However, the radar is now considered to be composed of dated technology with little upgrade potential. The last known orders for the DA.08 were awarded in 1994 for use on the Greek MEKO-200HN air defense vessels. These limitations, of both technology and follow-on orders, have apparently been recognized by Signaal-which has been pushing its SMART surveillance radar system over the DA.08 for the last few years.

Another sign that the DA.08 has reached the end of its useful life was the 1997 decision by Germany to replace all of its DA.08s with the DASA TRS-3D/32 radars. The Netherlands have also replaced their 1980s vintage DA.08s with the Signaal LW.08 during the mid-1990s.

The ten-year forecast indicates that only a single known DA.08 remains to be delivered. This system will be the last of the known orders placed during 1994, and will be procured by the Greek Navy for installation on its MEKO-200HN air defense frigate.

While no further orders are expected for this system, it is still possible that some nations could procure the DA.08 as part of a modernization, albeit dated, program. This particular scenario should be treated as an extremely low probability, and, if no further orders are placed during 1999-2000, it can be safely assumed that the DA.08 will effectively cease as a viable product for Signaal.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

			High Confidence Level				Good Confidence Level				Speculative		
Designation	Application	thru 98	99	00	01	02	03	04	05	06	07	08	Total 99-08
SIGNAAL DA.08	MEKO-200HN (GREECE)	3	0	1	0	0	0	0	0	0	0	0	1
SIGNAAL DA.08	Prior Prod'n:	49	0	0	0	0	0	0	0	0	0	0	0
Total Production		52	0	1	0	0	0	0	0	0	0	0	1