

# ARCHIVED REPORT

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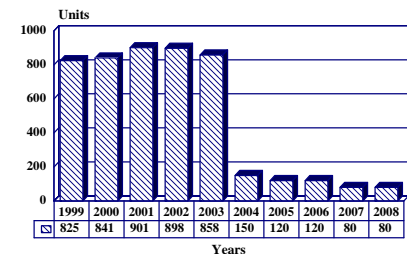
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## Outfit DLH/Siren - Archived 2/2000

### Outlook

- Good market potential; adaptable to many launcher systems
- Adopted by the UKRN and French navies
- Export potential is fair due to low cost *vis a vis* its performance capabilities and software upgradable threat library

10 Year Unit Production Forecast  
1999 - 2008



### Orientation

**Description.** The Outfit DLH/Siren system is an active offboard decoy system that uses an autonomous radar jammer against anti-ship missiles. Its primary means of jamming is through the use of seduction techniques.

#### Sponsor

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#### Contractors

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**Licensee.** No known production licenses have been granted.

**Status.** In production and in service.

**Total Produced.** Through 1998 an estimated 1651 decoys units had been produced. Additionally, an estimated 40-50 FCS shipsets are also believed to have been delivered.

**Application.** Through the adjustment of the transmitter this system has the capability of being used by ships ranging from patrol craft to capital ships.

**Price Range.** The unit price per round is estimated at US\$125,000 per round (1998 dollars). This price is based on the initial 1994 contract for 700 systems and then reduced to take into account start up costs.

## Technical Data

### Characteristics

<i>Deployment time (maximum):</i>	10 seconds
<i>Flight duration:</i>	180 seconds
<i>Frequency coverage:</i>	I/J band

	<u>Metric</u>	<u>US</u>
<b>Dimensions</b>		
<i>Round length:</i>	170 cm	67 in
<i>Round diameter:</i>	130 mm	5.1 in
<i>Round weight:</i>	28 kg	62 lb

**Design Features.** Siren, or Outfit DLH, as the program is known in the UK Royal Navy, is an expendable radiating decoy system. It is intended to provide last-resort platform protection against radar-homing missiles fired at surface vessels. This is done through seduction of the inbound missiles using jamming techniques. The system consists of a decoy controller and the decoy round, which can be launched from any standard 130mm launcher. Additionally, both IR and chaff rounds can be added if desired. Although chaff and IR can be controlled through the FCS, the chief component of the system is the decoy round.

The Siren decoy round consists of a rocket-propelled unit equipped with an integrated EW package. Once deployed it descends by a parawing in the chosen sector where it proceeds to seduce the approaching missile by means of a lightweight, low-power expendable jammer. The round is fully self-contained and after launch can operate without further support from the launch vessel, thus allowing that ship to maneuver away from the threat zone.

**Operational Characteristics.** Siren is a fast-reaction system, designed to operate in a significantly shorter time than a conventional chaff round. Unofficial reports suggest that the round can be operational within six to

eight seconds after leaving the launcher. At a preset distance from the ship, usually 400-500 meters, it deploys the parawing and switches on its own receiver, transmitter and control electronics using range-gate pull-off seduction techniques.

The decoy takes approximately 1½ minutes to descend. During this period, the receiver detects an approaching missile's radar emissions and a transmitter directs a jamming signal toward it. Operation off the ship means that the device can seduce missiles away from the ship, whereas shipborne jammers can only confuse and distract the oncoming missiles.

Siren belongs to the new generation of intelligent anti-missile expendables. It is low-cost but uses high-level hardware and software to achieve its mission, and requires no specialist or dedicated launch or after-launch controls. The system is also flexible enough so that it can be easily adapted to a wide range of naval applications or existing EW systems.

GEC-Marconi has considered the entire range of ship sizes and types during the development of the system. Software flexibility has been built into Siren, permitting adaptation of the system to new threats throughout the production career as well as allowing ships ranging in size from patrol craft to capitol to be protected.

## Variants/Upgrades

LAD. French for *Leurre Actif Decale* (Active Lure Decoy). This is a generic name given to a number of offboard decoys including Siren.

Outfit DLH. The official UK Royal Navy designation of the program.

Siren. The name under which the program is known in other markets. The only physical difference between the two products is known to be in their paint scheme.

## Program Review

**Background.** Marconi Defence Systems Ltd. (MDSL) initially began development of the active electronic countermeasures system, Siren, in 1982. Early feasibility studies and concept proving were started in 1983. Work then proceeded steadily, with extensive trials undertaken under both laboratory and field conditions. MDSL worked closely with the Admiralty Research Establishments in proving the effectiveness of offboard active decoys through mathematical analysis, engagement modeling and detailed simulation and use of demonstrator hardware.

In 1988, a pre-production Siren was delivered to the UKRN for evaluation, including the testing of demonstration hardware. Feasibility studies related to this program were completed, and a Project Definition Phase contract was scheduled to follow in 1989, but because of financial constraints, this was delayed until the following year.

The US Navy also expressed an interest in Siren. An extensive three-stage test and evaluation was performed in 1989 under the auspices of the Foreign Weapons Evaluation, now called the Foreign Comparative Test (FCT) program. However, no contract emerged from this testing.

In June 1990, two project definition contracts were awarded for the program that by now was officially designated as Outfit DLH by the UKRN. One of the contracts went to a Thomson-CSF/Thorn EMI consortium, the other to the GEC-Marconi Defence Systems/Dassault Electronique team. The contracts covered an 18-month period, with a competition between the prototypes leading to final development and production. In July 1994, GEC-Marconi Defence Systems then won a deal worth an equivalent of US\$125 million by the UKRN, for the final development and production of the expendable off-board active jammer.

Outfit DLH is intended for deployment on all UK carriers (both fixed- and rotorwing), destroyers, frigates and other surface vessels. It is also expected that the French will purchase a number of the Siren rounds for use in their Sagaie and Dagaie launchers. The above order covers the production of both the expendable munitions and the shipborne FCS systems launcher required to operate the equipment, but NOT necessarily the specialized launch racks.

## Funding

The Siren system was developed by GEC-Marconi Defence Systems using corporate funding. Outfit DLH is a UKRN program funded by UK MoD contract.

## Recent Contracts

<u>Contractor</u>	<u>Award (\$ millions)</u>	<u>Date/Description</u>
GEC-Marconi DS	125.0	<i>July 1994</i> – Development and initial production orders for Outfit DLH decoys and control systems. Initial production is reported at 700 rounds and 21 Fire Control Systems. The first ship to be fitted with Outfit DLH occurred in early 1995. Contract is believed to have been completed in 1998.

## Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1982	Development started
	1985	UKRN starts DLH program
	1988	UKRN DLH Feasibility Study complete
	1989	Project definition contract originally due
Jan	1989	Collaborative agreement between MDS and Dassault Electronique signed
	1989	US Navy completes three-stage test and evaluation program

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Jun	1990	Project definition contracts awarded
Jul	1994	Outfit DLH contract awarded to GEC-Marconi
	1995	HMS Ocean first known ship to be fitted with Outfit DLH

## Worldwide Distribution

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**UK.** The initial contract called for the production of 21 FCS systems and 700 rounds to begin delivery in 1995. Additional contracts have been rumored to supply an additional 40 FCS shipsets and 1500+ rounds sometime after 1998.

**France.** France, which has not advertised what active decoy systems are carried on board their ships, is believed to have or will be procuring as many as 45 FCS shipsets and up to 2880 rounds through the early 2000s.

## Forecast Rationale

The Outfit DLH system, which has also been designated Siren, is an active decoy used to seduce inbound antiship missiles from the target vessel. The system is extremely adaptable and can be integrated with a number of launchers including Seagnat, Sagaie, Dagaie, Super RBOC or any other 130mm launcher. While a specialized launcher has been designed for use with the DLH system, all have preferred to procure the fire control system (FCS) upgrade that would allow DLH to be used from the previously mentioned launchers.

Outfit DLH is intended to counter the latest generations of radar-guided anti-ship missiles. This is accomplished via an active seduction transmitter which aids in protecting the target vessel by shifting the jammer off of the target completely. As an added enhancement the system can be launched with chaff and/or IR decoys to enhance the emulation signature, thereby increasing the chances of a missile locking onto the decoy.

The Outfit DLH/Siren system has been in development since 1982 with the first pre-production units being delivered in 1988. Some of these units were obtained by the US Navy for testing in 1989, but were apparently deemed unsatisfactory for USN purposes as no further procurement occurred. In 1990 the UKRN awarded a new project definition contract to GEC-Marconi and Dassault Electronique for a redesigned DLF system that would take advantage of the various technological leaps in microprocessors, memory and software upgrade capabilities.

This definition phase was transformed into a production contract in 1994 for 21 fire control systems (FCS) shipsets and 700 Outfit DLH rounds for use by the UKRN. The first ship known to have been equipped with this system was the *HMS Ocean* in 1995. The

French Navy has also apparently procured the FCS and rounds from Dassault for use by its vessels.

The only real competition to Outfit DLH/Siren on the international market continues to be the Australian/US Nulka project. Since late 1997 the NULKA system has entered LRIP production with British Aerospace Australia, Ltd. and is being supplied to the Australian, Canadian and US Navies. However, NULKA is still suffering from problems regarding the consistency of its ability to detect inbound cruise missiles. The US Navy feels that this problem can be corrected by mid-1999.

The ten-year forecast is based on a requirement to equip up to 61 UK Royal Navy ships and up to 40 French vessels with Outfit DLH/Siren. The total numbers were derived by multiplying the number of barrels used on a particular nation's preferred launch system (six for the UK and ten for France) by the amount of launchers to be found on any particular ship class. This was then multiplied by three to take into account two full-load out on all launchers employed on a vessel plus an extra full-load out at dockside.

This method has undoubtedly increased the actual number of systems procured by these nations, but neither GEC-Marconi or Dassault Electronique would provide hard numbers. As such all forecasts for units procured by France and the UK should be treated as "Good".

While there has been no known export activity, the ability of the DLH system to be adapted to virtually any 130mm launcher will almost assuredly lead to some sales for the system on the export market. The figures for the export market should be treated as "Speculative" for the entire ten-year forecast due to a lack of confirming information.

## Ten-Year Outlook

### ESTIMATED CALENDAR YEAR PRODUCTION

Designation	Application	High Confidence Level				Good Confidence Level				Speculative			Total 99-08
		thru 98	99	00	01	02	03	04	05	06	07	08	
OUTFIT DLH	CV/DD/FF/PC (UK)	700	300	312	312	310	300	0	0	0	0	0	1534
SIREN	CV/DD/FF/PC (FRANCE)	841	405	409	409	408	408	0	0	0	0	0	2039
SIREN	CV/DD/FF/PC (VARIOUS)	110	120	120	180	180	150	120	120	120	80	80	1300
Total Production		1651	825	841	901	898	858	150	120	120	80	80	4873