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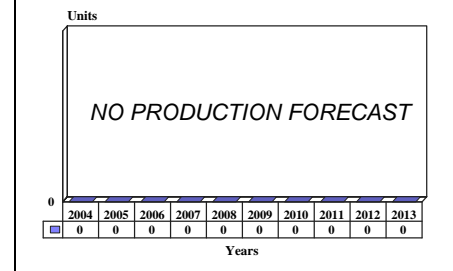
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Monarch - Archived 7/2005

Outlook

- With Monarch's only platform, the Phoenix UAV, due to retire in 2008 with no additional production, the Monarch production line is believed to have ended

10 Year Unit Production Forecast
2004 - 2013



Orientation

Description. Electronic warfare system for deployment on battlefield reconnaissance drones.

Status. In service.

Sponsor

United Kingdom Ministry of Defence
Procurement Executive
Room 614 St. Georges Court
14 New Oxford Street
London WC1A 1EJ
United Kingdom

Total Produced. An estimated 156 Monarch units were produced through 2002 (preproduction units not included).

Application. Unmanned air vehicle used for battlefield surveillance, reconnaissance, and electronic warfare/intelligence.

Licensee. No known production licenses have been granted.

Price Range. Based on the known price ranges of comparable systems, a Monarch system could cost approximately \$1.2 million.

Contractors

BAE Systems plc, <http://www.baesystems.com>, 6 Carlton Gardens, London, SW1Y 5AD United Kingdom, Tel: + 44 1252 373232, Fax: + 44 1252 383991, Prime

Technical Data

	<u>Metric</u>	<u>U.S.</u>
Dimensions		
High-band ESM		
Length	500 mm	19.8 in
Width	500 mm	19.8 in
Height	220 mm	8.7 in
Weight	18 kg	39.6 lb
High/Low-band ESM		
Length	500 mm	19.8 in
Width	560 mm	22.2 in

	<u>Metric</u>	<u>U.S.</u>
Height	220 mm	8.7 in
Weight	24 kg	52.8 lb
Dimensions (continued)		
Radar jammer		
Length	350 mm	13.9 in
Width	150 mm	5.9 in
Height	180 mm	7.1 in
Weight	4 kg	8.8 lb
Communications jammer		
Length	350 mm	13.9 in
Width	150 mm	5.9 in
Height	180 mm	7.1 in
Weight	4 kg	8.8 lb

Characteristics

Power

High-band ESM	110 W
High/Low-band ESM	150 W
Radar jammer	50 W
Communications jammer	50 W

Design Features. Monarch consists of a communications jammer and radar jammer, and electronic support measures (ESM) units designed to fit into the payload pod of a remotely piloted vehicle, as well as visual display units and tabular displays. It offers microprocessor-based technology and real-time operation.

Operational Characteristics. Monarch is a passive ESM system capable of acquiring electronic intelligence (ELINT) information, and initiating a series of countermeasures. Both communications and radar jamming are possible, with effective radiated power output equal to most battlefield tasks. Although the system can be preprogrammed to acquire ELINT and

record data, it can also be given mission commands by direct datalinks. Information can also be transmitted to a ground control station by the same means.

Monarch has been closely linked to the British Army's Phoenix battlefield surveillance and target acquisition unmanned air vehicles (UAVs). Phoenix is a long-range, high-endurance vehicle with low radar and infrared images for battlefield surveillance and target acquisition in support of long-range artillery at corps and division level. Operating in remotely piloted vehicles, Monarch allows access to dangerous or inaccessible terrain, or areas beyond the field of view, without jeopardizing human lives.

Variants/Upgrades

There are no known variants or upgrades to this system.

Program Review

The Monarch was developed in the mid-1980s based on two perceptions: that a market for electronic warfare equipment for installation on remotely piloted vehicles was growing, and that the British government had a requirement for such equipment on its Phoenix UAV. The Monarch was displayed at the British Army Equipment Exhibition in June 1988. At that time, its relationship to the Phoenix program was made apparent.

However, the Phoenix UAV's path to production has been plagued by obstacles. During 1990, Phoenix procurement was delayed by a combination of technical and financial pressures. The UAV received final

service acceptance late in 1993, only to encounter further problems, this time with system performance, in early 1995. These problems were reportedly related to the recovery method rather than the actual performance of the recon system; remedial action was undertaken by the contractor. The U.K. government seriously considered canceling Phoenix in 1996, but gave the program one more chance. Confident that it had solved the UAV's technical problems, GEC-Marconi (now BAE Systems) resumed production in mid-1997. The Phoenix was introduced for service with the U.K. military in 1998.

Initial Operational Capability for the Phoenix was achieved in 1998, some nine years behind the original schedule. The U.K. Ministry of Defence (MoD) has moved ahead with Phoenix procurement, at least on a limited basis. The procurement objective was originally 200 air vehicles with about 40 for reserves and training. Approximately 62 Phoenix systems had been produced by that date.

Successful deployment in Kosovo during 1998's Operation Allied Force significantly boosted British interest in UAVs. The MoD was interested in expanding the Army's UAV capability to include as many as 400 units, and considered upgrading the Phoenix.

The end of production for current Phoenix UAV orders for the United Kingdom appears to have held at 2002. With limited public source information regarding this highly sensitive system, it is difficult to accurately determine the amount of likely production for the Monarch beyond that year, and beyond the requirements for the newer UAVs as mentioned above.

In the spring of 2001, it was reported that the Phoenix UAV was expected to stay in service longer than had been previously anticipated. A re-engaged program was seen as making the vehicles operational until 2008 or longer.

The war on terrorism, begun after the September 11 attacks, provided an even more crucial testing ground for the value of UAV systems than had Kosovo. As a result, scores of U.S. systems were used in the difficult tasks of identifying targets in the mountains of Afghanistan. Aside from possible technology sharing with European UAV developers, it is not immediately certain how this increased interest will affect the Phoenix in general and the Monarch in particular.

Production of the Monarch for current Phoenix UAV requirements most likely ended in 2002. It is believed that the system will remain in service for the next several years.

Funding

Monarch was a company-funded development project. Dollar figures have not been identified.

Recent Contracts

No contractual information has been made publicly available.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1986	Monarch unveiled
	1988	Monarch shown at British Army Equipment Exhibition
	1996	GEC-Marconi given one last chance to fix Phoenix problems or face cancellation
Mid	1997	Phoenix entered production
	1998	Initial Operational Capability of Phoenix achieved
	2001	Spectator and Sender programs merged/renamed Watchmaker
Early	2002	War on terrorism increases interest in UAVs
Late	2002	End of current Phoenix production run
	2006-2008	Watchmaker UAVs likely to enter service
	2008	Retirement of Phoenix

Worldwide Distribution

The only known platform to date for the Monarch is the Phoenix UAV, which entered **United Kingdom** service in 1998. With the likely introduction of an upgraded Phoenix and/or Spectator and Sender (since merged and renamed Watchkeeper) UAVs in the next few years, there could be further U.K. procurement of Monarch.

Forecast Rationale

With new production for its primary platform (the U.K.'s Phoenix Unmanned Air Vehicle (UAV)) now ended, the prospects for continued production of the Monarch EW system have been dealt a death blow. While the Phoenix is expected to remain operational through 2008, and the Monarch system will be in service aboard it, newer platforms and electronic technology have taken over. The replacement for

Phoenix, the Watchkeeper system, is due to start production around the 2006-2008 timeframe.

As the Monarch's production cycle comes to a close, after seeing the production of 156 systems, the forecast production line for the Ten-Year outlook has been zeroed out. Consequently, this report has been archived.

Ten-Year Outlook

No further production is expected.

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