

ARCHIVED REPORT

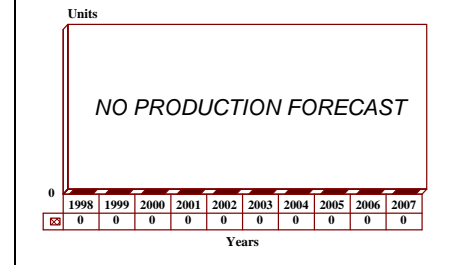
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Apollo -Archived 9/99

Outlook

- No known orders have been placed since the systems operational test debut in 1993
- Apollo has apparently been pushed aside by other, combat proven systems
- **THIS REPORT WILL BE DROPPED IN 1999**

10 Year Unit Production Forecast
1998-2007



Orientation

Description. Internally mounted or pod-mounted air-borne electronic countermeasures system/support measures system.

Sponsor

GEC-Marconi Radar Defence Systems Limited
The Grove
Warren Lane
Stanmore
Middlesex HA7 4LY
United Kingdom
Tel: +44 181 954 2311
Fax: +44 181 954 2018

Contractors

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Middlesex HA7 4LY
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Tel: +44 181 954 2311
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Licensee. No known production licenses have been granted.

Status. Ready for production.

Total Produced. Flight demonstration and preproduction systems only.

Application. An internal or pod-mounted modular ECM system for suitable strike aircraft capable of intercepting, identifying, and jamming a variety of threats including search, fire control, gun control and airborne intercept radar.

Price Range. As no contracts have yet been received, a unit price is not known.

Technical Data

Characteristics

Power requirements:	115 v, 400 Hz 3-phase and 28 v DC
Frequency coverage:	H- to J-bands (others optional)
Spatial coverage:	Fan beams switched fore and aft
Data links:	RS232 or RS422
Environmental:	MIL-A-8591G (pod), MIL-STD-810D (equipment)

Dimensions

	<u>Metric</u>	<u>US</u>
Diameter:	280 mm	11 in
Length:	2650 mm	105 in
Pod weight:	130 kg	286 lb
Pod weight (with RAT)	160 kg	352 lb
Inboard weight;	40 kg	88 lb

Design Features. The Apollo system was developed using modules from proven and in-service Marconi systems. These include warning receivers, jammers and digital processors combined in a lightweight package. The only fitting required in the cockpit is a simple off/standby/on switch. Apollo operates automatically so that jamming management does not add to the pilot's workload. The podded versions of Apollo fit on a standard hardpoint and can be quickly installed or removed. A conformal configuration optimized to customer requirements is also available.

Apollo is designed to be as self-sufficient as possible. If the aircraft's own electrical system cannot generate the power needed, the pod can be equipped with a ram air turbine (RAT) to supply the unit. The Apollo system is designed to interface with the GEC-MDS Merlin emitter library management system, permitting the equipment to be programmed on the flightline with the latest threat intelligence data.

Operational Characteristics. Apollo is capable of initiating passive and active countermeasures against threat radar emitters. The system has been developed for strike and light strike aircraft. The system is compact and can be integrated with the Marconi Sky Guardian receiver to carry out radar intercept. A processing and management module is employed to analyze and depict threats, while controlling a range of defensive measures ranging from the system's integral transmitter to chaff or IR flares. Chief threats against which the system is orientated include AD gun and AAM/SAM missile fire control radar.

When used with aircraft equipped with a radar warning system, Apollo momentarily blanks out its jamming signal so that the RWR can sample the threat environment. This updated threat information is then passed back to the jammer. The operation is synchronized to maintain peak jamming performance.

Variants/Upgrades

Apollo 1. This is the basic system that incorporates a repeater jammer.

Apollo 2. Similar to Apollo 1 but adds a frequency set-on repeater and noise deception capability for countering coherent and non-coherent threats.

Program Review

Background. The Apollo system started development in the early 1980s in response to a stated requirement from a Far Eastern country (probably Malaysia). The system design was recast in 1988 to make use of tried and tested components from the UK Royal Air Force's Zeus system. Effectively, Apollo has become a pod-mounted

version of Zeus and the current system bears no resemblance to that developed earlier. Development of Apollo in this new form was completed during 1988 with the system first being officially announced in August 1990.

By July 1991, work on optimizing the Sky Guardian/Apollo combination for the Hawk 100 and Hawk 200 aircraft had been undertaken in anticipation of orders from two customers, one in the Middle East, the other in the Far East. Aerodynamic testing of the Apollo pod was undertaken using an FR Aviation Falcon 20. The program utilized two representative pods and was concluded in September 1992.

Once the aerodynamic performance of the pod had been verified, an extensive program of active flight trials was undertaken using a Flight Operations Learjet 35 electronic aggressor aircraft. These trials involved a number of flights over the UK EW test range at RAF Spadeadam. The Apollo pod used was configured to

detect and identify various radar emitters and to execute the required jamming sequences stored in its onboard library.

These trials were concluded in May 1993 and were reportedly extremely successful. The Apollo pod performed precisely as planned in both its jamming and receiving modes and the monitored performance in the air verified that predicted from tests on the ground. As a result the Apollo system gained considerable additional credibility.

Since these tests there have been no known orders at all for this system through 1998. While GEC-Marconi still lists the Apollo as available it is doubtful that any orders will be generated in the future due to the system's age.

Funding

The development of Apollo remains a fully company-funded project.

Recent Contracts

No contractual activity at present.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1988	Development completed
Aug	1989	Apollo first shown to public
Jul	1991	Flight demonstration trials commenced
Sep	1992	Aerodynamic testing successfully concluded
May	1993	Active flight trials completed

Worldwide Distribution

No countries currently use the Apollo system.

Forecast Rationale

The Apollo system was designed as an airborne ECM system for use on combat aircraft/armed trainer families. The system came in two different versions (Apollo 1 and Apollo 2) and in two different configurations (podded and internal). The unit had accomplished all testing in 1993 and eagerly awaited orders.

Unfortunately, no known orders were ever placed for this system. While GEC-Marconi apparently continues to offer Apollo it is doubtful that a country would procure a system designed and built in the late 1980s when more modern systems are available.

The EW jammer market is highly competitive, and Apollo faced stiff competition from numerous US, French, German and Israeli systems. It seems apparent that this system was sluffed aside by many nations in favor of the other systems (especially the US and Israeli systems) potential interfacing problems, and the fact that Apollo has its ancestry in a Malaysian requirement.

The ten-year forecast continues to indicate that no potential orders for this system exist either currently or in the future.

Ten-Year Outlook

No production forecast. **THIS REPORT WILL BE DROPPED IN 1999 BARRING AN INCREASE IN CONTRACT ACTIVITY.**

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