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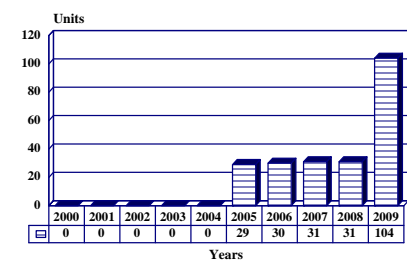
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UK Medium Surface-to-Air Missile - Archived 5/2001

Outlook

- The UK Could meet its MSAM requirements by purchasing MEADS
- London is interested in a theater missile defense capability and could procure the Patriot PAC 3 to meet this need
- The UK has been talking to the United States about becoming involved in its national missile defense program, but has yet to publicly commit itself to this effort

10 Year Unit Production Forecast
2000 - 2009



Orientation

Description. Medium-range surface-to-air missile system.

Sponsor. The United Kingdom Ministry of Defence (MoD), London, through the Royal Air Force (RAF).

Contractors. No specific MSAM contractor was selected prior to the program's cancellation. The competitive UK MSAM teams were led by: British Aerospace Dynamics, Stevenage, England, UK, and Raytheon Company, Lexington, Massachusetts (MA), USA; Hughes Aircraft Company, Canoga Park, California (CA), USA, Siemens-Plessey, Chessington, England, UK, and Kongsberg, Kongsberg, Norway; and GEC-Marconi Dynamics Ltd, Stanmore, England, and Eurosam GIE, Chatillon, France. The winner of this competition will also be required to integrate it with the Improved UK Air Defence Ground Environment (IUKADGE) command and control system.

Status. Bidders were being examined when the United Kingdom decided to defer the MSAM program. The MSAM was expected to enter service before the end of the decade, although the UK MoD did say that it could be deployed anytime between 1995 and 2000. The Bloodhound has been phased out of active service with the Royal Armed Forces. A formal study into ballistic missile defense was conducted by the UK Ministry of Defence. A contract was awarded in November 1994.

Total Produced. Production has not commenced. The UK planned to procure and equip six MSAM units. Initial deliveries were to commence in 1998. A naval ballistic missile defense system is not expected to be fielded until after 2010.

Application. For medium-range air defense against tactical and strategic aircraft, possibly incorporating an anti-tactical ballistic missile capability.

Price Range. The overall cost of the proposed missiles varies from \$300,000 to \$800,000.

Technical Data

Design Features. No specific technical information is available on the UK MSAM missile, since a selection from among the competitors has not been made.

Variants/Upgrades

No specific variants or upgrades are known, since the final system selection has not been made. For additional information, please see the pertinent entries in the **Program Review** section of this report.

Program Review

Background. The NATO alliance has depended on the MIM-23 HAWK and various other missile systems for over three decades to fulfill its medium-range air defense needs. However, as the 1970s progressed, it became apparent that a replacement for these older generation medium-range air defense systems was required. A tentative NATO MSAM (Medium-range Surface-to-Air Missile) project was initiated in 1979, aimed at development of a successor system. At first, this program was a trilateral study involving the United Kingdom, France and Germany. The United States was not initially interested in this study effort since it wished to market the Patriot for the potential MSAM requirement. The study was completed in 1981 with an agreement on a basic concept proposal. However, at this point the United Kingdom withdrew its participation because of a different priority being assigned to the requirement for a successor to the Bloodhound air defense system. France and Germany briefly continued joint studies, but in 1983 Germany withdrew from the program on financial grounds, resulting in the collapse of the program. Each country commenced individual national MSAM programs: Germany, the Taktisches Luftverteidigungs System (TLVS); France, the Famille de Systems Anti-aeriens Futurs (FSAF); and the United Kingdom, the MSAM.

UK MSAM. The UK Ministry of Defence issued an Invitation to Tender for the RAF MSAM in July 1991. Responding companies offered the following system bids:

- The team of British Aerospace and Raytheon offered a combination system consisting of the Rapier 2000 and the MIM-104 Patriot PAC-2. In its bid, the Patriot would cover the medium- and high-level defense, with the Rapier 2000 providing low-level coverage. The latter system's fire units would be fully linked with the Patriot network. Rapier procurement for this requirement would be in addition to those already ordered for the air force and army. The inclusion of the Rapier 2000 in the response reduced significantly the number of Patriot missiles needed to meet the threat range.
- GEC-Marconi Dynamics teamed with Eurosam to offer a version of the SAMP/T (Systeme Anti-aerien a Moyenne Portee/Terrestres) outfitted with the ASTER 30 missile. The system, with 48

missiles to every battery, could engage supersonic aircraft at ranges of up to 30 kilometers and missiles at 10 kilometers. The consortium explored growth options to include an anti-tactical ballistic missile engagement capability. This system would require three C-130 transports to move a minimum MSAM detachment consisting of: one ARABEL radar, power supply unit (PSU) and vehicle; one engagement module, PSU and vehicle; one launcher with eight missiles and vehicle; and a container of 24 spare missiles.

- Hughes and Kongsberg Gruppen of Norway proposed the Advanced Surface-to-Air Missile System (AdvSAMS), a variant of the Norwegian NASAMS which uses the AIM-120 AMRAAM missile. The bid offered the Hughes TPQ-36A radar, a further development of the TPQ-36 Firefinder artillery locating radar. Typically, each truck-based launcher would carry six missiles connected via a datalink to the fire direction center (FDC) to receive information from the radars. Information would also come from higher level sensors such as E-3A AWACS and RAF Rapier air defense units. A typical fire unit would consist of an FDC, TPQ-36A radar and three launchers capable of simultaneously engaging up to six targets. For increased battlefield survivability, the launchers could be positioned up to 25 kilometers from the FDC. Siemens-Plessey Radar, a participant in the AdvSAMS effort, cooperated with Hughes on the development of a high-performance radar (HPR) option. The HPR, an active phased-array ground-based radar, would be developed from the MESAR (multi-function electronically scanned adaptive radar) demonstrator program sponsored by Siemens, the UK Defence Research Agency and the US Army Strategic Defense Command. The system had growth potential in that more advanced versions of the MESAR and AMRAAM, the latter being the ASAM-1 missile equipped with a larger motor, could be incorporated at a later date. Other Hughes subcontractors included Cossor Electronics (identification friend or foe), Marshalls of Cambridge (shelters), Clark Masts (communication masts), Howden Air Control (NBC/air subsystems), Lucas Industries (missile actuators), G&M Power Plant

(generators), Pari Air Electronics and Rockwell Collins (radios), RTS International (trailers) and Roke Manor Research (HPR design).

These studies were part of the Future Medium Surface-to-Air Missile project which is to meet Staff Target (Air) 1235. The United Kingdom is considering joining the multinational MEADS (Medium Extended Air Defense System) program. The MEADS program involves the United States, Italy and Germany (see separate MEADS report).

UK ABM Study. The United Kingdom issued an Invitation to Tender for a prefeasibility study on an anti-ballistic missile defense system in early 1994. The UK ballistic missile defense move was a departure from the canceled MSAM since it focused mainly on defending against aircraft. The United Kingdom turned its attention to ballistic missile defense (BMD), despite the fall of the Soviet Union, due to the growing threat posed by the unstable North African and Middle Eastern countries which possess expanding inventories of long-range ballistic missiles capable of carrying nuclear or chemical warheads. This decision was supported by a Western European Union symposium's recommendation that an anti-missile defense program be initiated to provide the continent with a defensive system capable of intercepting a target at a range of up to 3,000 kilometers.

Bidders for the UK contract included: British Aerospace Dynamics (now Matra BAe Dynamics); GEC-Marconi; Data Sciences; EDS Scicon Defense; Logica Defense; Smith System Engineering; and the Vega Group. BAe was selected to perform this BMD study in November 1994. The 18-month study, worth £3 million (\$4.62 million), called for BAe to carry out a review of existing and maturing technologies needed to defeat a ballistic missile threat to the United Kingdom. The work was to be undertaken on the basis that North African, Middle Eastern and southern CIS republics would be able to target the United Kingdom with ballistic missiles from 2010. The studies could be widened to incorporate concurrent European programs.

The BAe Dynamics team included: Siemens-Plessey Electronic Systems (organic sensors), Chessington; Hunting Engineering Ltd (threat definition and battle modeling), Bedford; Thorn EMI Electronics (command and control), Hayes; and GEC-Marconi (representing all parts of the group and looking at early warning, ground and space based sensors), Stanmore. BAe Dynamics will represent the whole of BAe Defense, including Military Aircraft and Royal Ordnance divisions. Other contributing firms were Lockheed, TRW, Matra and CoSyDe (made up of Thomson and Aerospatiale) of France. An agreement had been reached with Martin Marietta, Raytheon and then Daimler-Benz (now DaimlerChrysler) for information exchange.

Funding

Defense budget shortfalls resulted in further delays in the UK MSAM program. In 1991, the UK MoD said that it may not place a contract as a result of the Invitation to Tender bids. However, the House of Commons Select Committee, speaking about the Bloodhound replacement in June 1991, said, "We are dismayed that a significant part of our air defenses should be allowed to become obsolete without a replacement being procured." However, since the demise of the Soviet Union, the high-level massed air attack threat against the UK had almost disappeared and, some argued, so too had the need for a system such as the MSAM. The original MSAM contract was estimated to be worth between \$900 million and \$1.85 billion.

Recent Contracts

No UK MSAM development or procurement contracts have been awarded.

Timetable

<u>Year</u>	<u>Major Development</u>
1979	Tentative NATO MSAM project initiated
1981	Joint MSAM program collapses
1991	UK MSAM Invitation to Tender
1993	MSAM program deferred
1994	UK Ballistic Missile Defense study initiated
2000s ^(a)	Ballistic missile defense system enters UK service

^(a)estimate

Worldwide Distribution

User Country(s). Initial operator will be the **United Kingdom** once a system is procured.

Forecast Rationale

Of NATO’s European members, the United Kingdom is probably the most interested in establishing a comprehensive missile defense capability. Still, London has not publicly pledged its support for any US national missile defense system. Instead, the United Kingdom is much more interested in a theater missile defense system.

The proliferation of ballistic missiles, especially among such volatile nations as North Korea and Iraq, has heightened interest in defensive systems around the world. Some UK officials believe it is essential that the United Kingdom acquire a ballistic missile defense capability if it is to participate in any significant out-of-area military operations.

The United Kingdom is expected to turn to the United States to meet its theater missile defense requirements. London’s options include the Patriot PAC 3 and

THAADs, although the former is believed to be the favored system. As for its medium-range air defense needs, the UK could purchase MEADS, although it may not become involved in the system’s development.

As a complement, or perhaps an alternative, to a land-based system, the UK could acquire a ballistic missile defense capability by incorporating it into the Royal Navy’s Horizon CNGFs. The PAAMS air defense system would provide the basis for this BMD capability. But the Royal Navy has termed its studies to date as “low profile,” and an operational system is unlikely to be fielded until 2010.

The United Kingdom is expected to acquire new air defense missile systems but will do so in its own good time. Actual procurement of such systems will likely be delayed until after the turn of the century, when additional funds may be freed up.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

Missile	(Engine)	ESTIMATED CALENDAR YEAR PRODUCTION												Total 00-09
		thru 99	00	High Confidence Level		Good Confidence Level		Speculative						
				01	02	03	04	05	06	07	08	09		
NOT SELECTED														
UK BMD	UNSPECIFIED	0	0	0	0	0	0	29	30	31	31	27	148	
UK MSAM	UNSPECIFIED	0	0	0	0	0	0	0	0	0	0	77	77	
Total Production		0	0	0	0	0	0	29	30	31	31	104	225	