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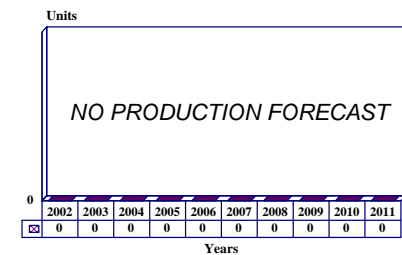
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SS.12M - AS.12/AS.15TT/MM.15 - Archived 2/2003

Outlook

- No longer in production
- Final AS.15TTs have been delivered to clients
- No further procurement contracts are anticipated
- Kuwait selected the Sea Skua over the MM.15 to arm its new warships
- Production of the SS.12 and AS.12 missiles was terminated in 1989

10 Year Unit Production Forecast
2002 - 2011



Orientation

Description. Lightweight tactical anti-ship missiles launched from seaborne or aerial platforms.

Sponsor. The French Ministry of Defense sponsors the SS.12M and the AS.12 for the French Navy and Naval Air Force. The development of the AS.15TT is in-house, with some funding provided by Saudi Arabia.

Contractors. The missiles were developed and produced by Societe Nationale Industrielle Aerospatiale (SNIA), Division Engins Tactiques. However, the company has been renamed and is known as Aerospatiale SNI, with the Tactical Missile Division redesignated Aerospatiale Missiles, Chatillon, France. Aerospatiale is program prime contractor, with Thomson-CSF as the major subcontractor for the supply and integration of the Agrion 15 radar components.

Major Subcontractors. Artus SA, Forgeal, SFENA Societe Nationale des Poudres et Explosifs, TRT, and Thomson-CSF.

Status. Production of the SS.12M/AS.12 and the AS.15TT has been completed. Deliveries of the initial Saudi Arabian order for 221 AS.15TT missiles were completed in 1988. It is thought that firm orders are held for a further 75 missiles, but whether these are against anticipated requirements for Bahrain, Saudi Arabia, the United Arab Emirates, the Indian Navy, or

an undisclosed customer is not certain. The MM.15 is being offered on the export market.

Total Produced. As of 2001, 11 MM.15 and 429 AS.15TT missiles (including all RDT&E units) had been completed. Production of the SS.12 and AS.12 was concluded after the production of 10,461 missiles. Prior to the UAE buy, total orders for the AS.15TT were reported to stand at 294 missiles, although it has not been possible to confirm any further orders beyond the 221 units for Saudi Arabia. The Saudi Navy operates 24 AS 365F Dauphin 2s from frigates and shore bases, 20 of which are armed with AS.15TTs. The Indian Navy may yet select the AS.15TT to arm 26 Do 228s, but no firm order has been announced.

Application. Originally developed from the tactical anti-armor SS.12 missile, the SS.12M is mounted aboard ships of various sizes as a weapon to disable or sink enemy shipping. The AS.12 and AS.15TT are air-launched anti-ship missiles able to be deployed aboard a variety of fixed- and rotary-wing aircraft. The MM.15 is designed for coastal defense.

Price Range. Approximately \$294,600 in Fiscal 1992 dollars; this figure is for the AS.15TT, which is to compete in the market with Sea Skua (see separate report). The last information available in 1987 dollars

for the SS.12M/AS.12 was approximately \$76,000 per system.

Technical Data

	<u>Metric</u> SS.12M	<u>Metric</u> AS.12	<u>Metric</u> AS.15TT	<u>US</u> SS.12M	<u>US</u> AS.12	<u>US</u> AS.15TT
Dimensions						
Missile Length	187 cm	187 cm	230 cm	6.14 ft	6.14 ft	7.55 ft
Missile Diameter	21 cm	21 cm	18 cm	8.27 in	8.27 in	7.09 in
Missile Weight	75 kg	75 kg	96 kg	165.01 lb	165.01 lb	211.20 lb
Missile Wingspan	65 cm	65 cm	53 cm	25.59 in	25.59 in	20.87 in
Performance						
Speed	260 m/s	260 m/s	280 m/s	505 kt	505 kt	543.92 kt
Range (Max)	6-8 km	6-8 km	15+ km	3.24 nm	3.24-4.32 nm	8.10 nm

Propulsion. The SS.12M and AS.12 use solid-fuel rockets produced by Societe Nationale des Poudres et Explosifs. The AS.15TT and MM.15 both use the Anubis solid-fuel sustainer motor and Acis booster rocket manufactured by the same firm.

Control & Guidance. The SS.12M/AS.12 utilizes command-to-line-of-sight wire guidance. A stabilized sight is used with the AS.12 that allows the aircraft to maneuver after launch. Spin stabilization is employed. The AS.15TT uses a Thomson-CSF Agrion 15-frequency agile search radar to acquire and automatically track the target. A sea-skimming flight path is followed. The missile's command-to-line-of-sight guidance system is automatically slaved to the radar, and a coded radio datalink is employed in order to neutralize countermeasures.

Launcher Mode. The SS.12M missile is launched from eight forward-facing, fixed-position launchers aboard

ships and fast attack craft. The AS.12 is deployed in two or four launchers aboard helicopters or four launchers aboard fixed- and rotary-wing aircraft. The AS.15TT is deployed in four launchers aboard the Aerospatiale AS.332 and other helicopters. Land-based, coastal defense mountings are under development for AS.15TT; the new missile is designated MM.15; six launch containers are mounted on a wheeled vehicle that also contains the guidance and control equipment.

Warhead. The weight of the warhead on the SS.12M/AS.12 missiles is 28.4 kilograms (62.6 lb). Three types of warheads are available: a shaped charge, fragmentation, and a highly effective OP.3C warhead that can penetrate four centimeters (1.57 inches) of armor. The AS.15TT warhead is similar but slightly heavier at 29.7 kilograms (65.34 lb).



MM.15

Source: Aerospatiale Matra

Variants/Upgrades

Four missile systems are mentioned in this report: the SS.12 surface-to-surface and AS.12 air-to-surface missiles, the AS.15TT, and the ship-launched MM.15.

For additional information on these missiles, see the pertinent entries in the **Program Review** section.

Program Review

Background. The SS.12M and AS.12 are second-generation missiles that are derived from the technology of the highly successful and widely used SS.12 battlefield missile. The SS.12M and AS.12 are designed to be more versatile missiles, combining the ability to employ several different warheads with more advanced propulsion technology. The range of the SS.12 was doubled, and the standard warhead on the SS.12M/AS.12 is stated to be four times as powerful as the one employed on the SS.12.

The SS.12M and AS.12 have a wide-user acceptance; at least seven navies deploy the SS.12M, while the air-launched AS.12 has found favor with at least 17 naval air arms and air forces aboard seven types of fixed-wing and eight types of rotary-wing aircraft.

The LASSO Project. The LASSO (Light Anti-Surface Semi-automatic Optical) project was announced as a private development effort by Aerospatiale in early 1977. Since then, LASSO has quietly faded from the scene. It seems that the project was a victim of the rapid advances in technology associated with tactical missiles. LASSO was to incorporate wire guidance with a rolling airframe and subsonic performance. Wire-guided air-to-surface missiles have no place in this era of fire-and-forget technology. Aerospatiale, viewing the development of missiles such as Harpoon and Sea Eagle, saw the handwriting on the wall regarding their optically tracked, wire-guided missile and let the project die.

Saudi Arabia and the AS.15. At approximately the same time that LASSO was being revealed at the Paris Air Show in 1977, Saudi Arabia apparently approached Aerospatiale with a request to develop a more advanced anti-ship missile with greater autonomous performance but within the lightweight (approximately 100 kg) class of the AS.12 for use aboard rotary-wing aircraft, small ships, and naval patrol craft. Sources indicate that Saudi Arabia funded a major portion of the research and development work on the missile. The French are Saudi Arabia's largest arms supplier; a similar agreement for Saudi financing has been arranged with France for the

development of other weapon systems, such as the R.460/Shahine missile system. Saudi Arabia also contracted for 24 Aerospatiale AS.365F helicopters at the same time the new missile program was initiated. The AS.15TT is the main armament for 20 of these helicopters.

The AS.15TT was developed to remedy a major shortcoming of the SS.12M/AS.12: the need for the operator to visually track the target and manually control the missile with a joystick. The technologically obsolete wire guidance system was also dispensed with, as was the optical tracking system, which had serious deficiencies in inclement weather. The Agrion 15 radar is employed in the new system to give it all-weather capability; the TT in the systems nomenclature means *tous temps* – all weather.

Combat Experience. While the AS.12 is obsolescent technology, the missile proved its combat effectiveness when it damaged an Argentine vessel in the 1982 Falklands War. The AS.12 also recorded at least eight successes in the Iran-Iraq Gulf War. The AS.15TT was used by Saudi helicopters to destroy some five Iraqi surface vessels.

MM.15. The long-rumored surface-to-surface version of the AS.15TT was confirmed in September 1984 when the MM.15 variant was publicly revealed. Aerospatiale and Thomson-CSF had proposed a land-based light missile battery using AS.15TT as early as 1979. The missile is intended to arm naval fast attack craft, integrated with a ship-based variant of the Agrion 15 radar. The MM.15 missile is essentially the same as the AS.15TT but is protected against corrosion from the saltwater environment. Total missile weight is 103 kilograms. Designed for smaller vessels, a deck-mounted battery contains four missiles sealed against the environment. Normally, two batteries are mounted. No orders have been placed for the MM.15, although Aerospatiale believes that Indonesia, the Philippines, and the Republic of Korea are potential customers.

Funding

No information is available concerning funding allocations by the French or Saudi governments.

Recent Contracts

Contract awards have not been announced.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Mid	1960s	Design of SS.12M/AS.12 conceived
	1965-66 ^(a)	Research and development testing of -12 missile
	1967 ^(a)	Low-rate production, IOC for -12 missiles
	1969-70 ^(a)	Export sales - SS.12M/AS.12
	1975	Design of LASSO conceived
	1976	Design of AS.15TT conceived
	1977	AS.15TT and LASSO projects unveiled at Paris Air Show
	1977-80	Research and development testing of LASSO and AS.15
	1979	Aerospatiale/Thomson proposal for AS.15TT coastal defense role
	Oct	1980
1981		Apparent demise of LASSO
Jun	1981	First flight of AS.15TT
	1982	First helicopter launch
Oct	1982	AS.15TT trials on AS.365 Dauphin 2 helicopter
Sep	1984	MM.15 announced
	1984 ^(a)	Initial low-rate production of AS.15TT for Saudi order
	1985	Completion of operational tests
Mar	1985	Delivery of first AS.365F helicopter to Saudi Arabian Navy
Jun	1985	Last development firing complete with military charge
	1985	Full-scale production of AS.15TT
Aug	1986	Final AS.365F Dauphin delivered to Saudi Arabia
Oct	1986	Dornier Do 228 coastal patrol aircraft exhibited with AS.15TT at Le Bourget Naval Exhibition
	1987-88	Development and production of several variants continued
	1989 ^(a)	MM.15 presented at the Paris Air Show '89
	1991 ^(a)	AS.15TT production suspended awaiting further orders
	1995	UAE ordered unknown number of AS.15TTs for new helicopters

^(a)Estimate

Worldwide Distribution

The AS.15TT has secured export orders from **Abu Dhabi** (UAE), **Iraq**, **Bahrain**, and **Saudi Arabia**. **Saudi Arabia** was the first to purchase the AS.15TT missile. Riyadh contracted for 200 AS.15TT missiles to equip its AS.365 helicopters. Iraq placed the second AS.15TT order to outfit its six new AS.365N Dauphin helicopters. The **Iraqi** deal is worth a total of \$131 million, including an unknown number of AS.15TT missiles (estimated to be 206). These missiles do not appear to have been used during the recent fighting in the Persian Gulf. Furthermore, deliveries may not have been completed before the Iraqi invasion of Kuwait in August 1990. **Bahrain** ordered the missile for its naval helicopters, which are deployed on its Lurssen fast patrol boats. The **United Arab Emirates** (Abu Dhabi) announced its procurement of the AS.15TT in early 1995. After a long competition, Abu Dhabi decided to order seven AS.565 Panther helicopters and have the five AS.552 Cougars already in service retrofitted for naval operations. The prime contractor will be Eurocopter. The Panther helicopters will be equipped with the

AS.15TT, although no specific missile procurement figure has been announced. Deliveries of the helicopters were planned to be completed by mid-1998. The Cougars will be outfitted with the AM.39 Exocet.

The anti-ship missile market is crowded now and expected to become even more so over the next 10 years. The major penetration of the Middle East market with the Saudi sale should aid the sale of the AS.15TT to other countries in this area, where France has traditionally fared well. In 1988, total AS.15TT orders stood at 221 missiles, all of which have been delivered.

Additional customers for the AS.15TT could include **Kuwait** and **India**. Kuwait has selected the Sea Skua to arm its new fast patrol boats, although Aerospatiale is protesting this decision (see "Sea Skua" report for more details). These vessels are to be equipped with surface-to-surface and anti-aircraft missiles.

The AS.15TT, Sea Skua, and Penguin were also competing for the potential buy of helicopter-launched missiles by **Australia** and **New Zealand**. However, Australia chose the Penguin, while New Zealand will procure the AGM-65G Maverick. These missiles will arm helicopters deployed on ANZAC frigates.

French Deployment. The **French Navy** deploys the AS.12 anti-ship missile on 40 Westland Lynx Mk 2(FN) and Mk 4(FN) ASW helicopters and also has in its inventory the SS.12M. The French Army uses a modified SS.12 to fulfill its requirements. However, these helicopters are expected to be replaced in the near future, which could prompt the French Navy to procure the AS.15TT for its new NH-90 helicopters.

User Country(s). The SS.12M/AS.12 have been widely accepted on the export market. Known users include **Abu Dhabi, Argentina, Brunei, Chile, France, Gabon, India, Iran, Iraq, Italy, Ivory Coast, Kuwait, Libya, Madagascar, the Netherlands, Nigeria, Norway, Qatar, Saudi Arabia, South Africa, Spain, Tunisia, the United Kingdom, and Venezuela**. The AS.15TT has been purchased by **Abu Dhabi (UAE), Bahrain, Iraq, and Saudi Arabia**.

Forecast Rationale

Interest in the AS.15TT appears to have evaporated with its defeat in the Kuwaiti missile competition. No further inquiries into the availability of this missile seem to have been made in over a year.

marketing other missiles and looking toward the development of an eventual follow-on. Therefore, no further production of the AS.15TT or MM.15 missiles is anticipated.

Since Aerospatiale Matra's incorporation into MBDA, the new megacorporation is putting its energies into

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

Missile	(Engine)	thru 01	High Confidence Level				Good Confidence Level				Speculative		Total 02-11
			02	03	04	05	06	07	08	09	10	11	
AEROSPATIALE													
AS.15TT	ANUBIS	429	0	0	0	0	0	0	0	0	0	0	0
MM.15	ANUBIS	11	0	0	0	0	0	0	0	0	0	0	0
SS.12M/AS.12	UNSPECIFIED	10461	0	0	0	0	0	0	0	0	0	0	0
Total Production		10901	0	0	0	0	0	0	0	0	0	0	0