

ARCHIVED REPORT

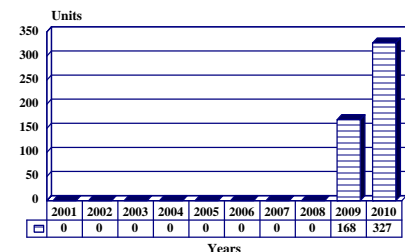
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FMTI - Archived 5/2002

Outlook

- Research continuing
- The Future Missile Technology Integration (FMTI) program is structured as a technology base effort
- Items developed under FMTI could help in the design of a future dual-mission missile
- Program that could benefit from FMTI include the Modernized HELLFIRE and JAWS programs

10 Year Unit Production Forecast
2001 - 2010



Orientation

Description. Multipurpose next-generation combined arms missile system.

Sponsor. The US Department of Defense through the US Army Aviation & Missile Command (AMCOM), Redstone Arsenal, Huntsville, AL, in cooperation with the US Marine Corps.

Contractors. No specific contractor has been selected, although US and overseas firms have expressed an interest in this program. The US Army Aviation & Missile Command's Research, Development and Engineering Center, Redstone Arsenal, is involved in this effort. Major contractors include: Raytheon; TRW; and Lockheed Martin.

Status. Concept development and component testing. TACAWS was restructured as the technology base program and is designated Future Missile Technology Integration (FMTI) effort. If a system is developed, it will be under another program title.

The FMTI project provides for the demonstration of an advanced tactical missile and systems technology, including seekers, propulsion, airframes, warheads, and guidance and control.

Total Produced. No full-up unit production is anticipated.

Application. To provide the US Army with a next-generation missile system for air-to-air, air-to-ground, ground-to-air, and ground-to-ground missions. The missile is expected to have a capability against non-line-of-sight and masked targets, and will offer a top-attack option.

Price Range. No specific price can be provided since this program is in the earliest stages of concept development.

Technical Data

Design Features. No technical data are available. Multiple seeker options are being examined, but a man-in-the-loop guidance capability will be included through the use of a radio frequency datalink. The missile may use a liquid fueled propulsion system designed to provide variable thrust to fly at supersonic

(for targets at 5 kilometers) and subsonic (for targets at 10 kilometers+) speeds. TRW is developing the engine under a three-year, \$4.4 million contract. The engine will use a gelled fuel that will provide a lower signature and enhanced safety. Weight has varied from 60 kilograms to a low of 28 kilograms. A 15- to 18-second

(10 seconds desired) time-of-flight to 5 kilometers and an off-axis launch capability of plus or minus 30 to 60 degrees have also been mentioned. The system will supposedly make use of composite materials, unusual wing designs and tail control. Warhead technology is being examined under an Armament Research, Development and Engineer Center (ARDEC), Picatinny Arsenal, effort known as Project Reliance. The system

would be compatible with the BGM-71 TOW and AGM-114 HELLFIRE launchers. Proposed launch platforms for an FMTI-type missile include the RAH-66 Comanche, AH-64 Apache and AH-1 Cobra attack helicopters, the M2/M3 Bradley fighting vehicle, the M998 High Mobility Multi-purpose Wheeled Vehicle (HMMWV) and the Light Armored Vehicle (LAV).

Variants/Upgrades

There are no specific FMTI variants or upgrades, since the aim of this program is not to develop a specific missile system. If a true multirole missile system is

developed by the United States, the FMTI program will feed information into it but the missile will carry an entirely different designation.

Program Review

Background. The Army Combined Arms Weapon System (also known as TACAWS) was an outgrowth of an earlier Missile Technology Project A214. Originally, the US Army envisioned TACAWS, then standing for The Air Counter-Air Weapon System, as a possible next-generation replacement for the FIM-92 Stinger in all its mission roles except manportable air defense. TACAWS would provide a common system (or possibly baseline system) for the US Army's helicopter and mobile air defense vehicles in the 21st century. Eventually, the TACAWS mission requirements were expanded to include ground-to-air, air-to-air, air-to-ground and ground-to-ground roles.

The TACAWS project was later structured as a technology base effort for the US Army/Marine Corps' Joint Advanced Weapon System (JAWS – see separate report) program, under which any actual missile system would be developed if the program moved forward. JAWS is a proposed joint service program which will fulfill US Army and Marine Corps Mission requirements. Most recently, TACAWS became the Future Missile Technology Integration (FMTI) effort which is to demonstrate "Leap Ahead" missile technologies for the 21st century.

FMTI. The FMTI effort has assumed much of the work formerly assigned to TACAWS. This project provides for the demonstration of advanced tactical missile technologies including seekers, propulsion, airframes, and guidance and control. FMTI will also demonstrate lightweight multirole missile technology in support of ground-to-ground, ground-to-air, air-to-air and air-to-ground missions. The program aims to demonstrate the feasibility of a multirole/multitarget/multiplatform system in one missile.

Particular attention will be paid to the development of infrared (IR) seeker technology capable of long range

lock, variable thrust propulsion allowing system range extension, innovative use of radio frequency (RF) data links for identification friend or foe (IFF), and the attack of targets masked from the launch platform. The missile system demonstration includes the integration of guidance, control, propulsion, and airframe technologies capable of performing in high clutter/obscured, adverse weather environments and under countermeasure conditions.

Missile control and guidance system technology will explore capabilities such as lock-on before/lock-on after launch, fire and forget, command guidance, imaging IR signal and image processing, and wide band secure data links. Seeker technology will address imaging infrared, millimeter wave, and laser radar (LADAR) seeker technologies combined with the existing semi-active laser, in order to provide precision strike and fire-and-forget guidance modes without major modifications to the host platform.

Affordable, controllable thrust rocket motors, such as gelled bipropellants or pintle-controlled solids, will be demonstrated to provide longer ranges and shorter flight times while increasing system robustness in the air-to-ground and ground-to-ground roles. Automatic target recognition will be demonstrated permitting true fire-and-forget at targets beyond visual range.

Finally, the secure wide-band datalink hardware that allows for target position updates during missile flight will be demonstrated.

These efforts are a risk mitigation effort in support of the FY03 engineering and manufacturing development start for Modernized HELLFIRE. The objective of the Modernized HELLFIRE technology effort is the demonstration and integration of dual or multi-mode seeker concepts, controllable thrust rocket motors (gels

or pintle-controlled solids), automatic target recognition (ATR), and wide-band secure datalinks.

Modernized HELLFIRE will leverage technologies developed and demonstrated under the Future Missile Technology Integration effort as well as the ongoing DARPA Advanced Fire Support System (AFSS) program and will be executed in two phases. The first

phase will conduct detailed analysis of the above technologies for maturity, packaging, risk, and cost.

The second phase will design, fabricate, integrate and test a prototype Modernized Hellfire missile through live-fire demonstrations as part of the AFSS program.

Flight tests of selected seeker and propulsion system are scheduled to take place during FY01.

Funding

Funding for both FMTI and Modernized HELLFIRE is included in the FY01 budget requests. FMTI funding is included under the PE#0603313A Missile and Rocket Advanced Technology.

	<u>US FUNDING</u>											
	<u>FY98</u>		<u>FY99</u>		<u>FY00</u>		<u>FY01</u>					
	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>		
US Army												
<u>RDT&E</u>												
Proj - 1	-	-	-	-	-	-	-	-	-	-	5.0	
Proj - 2	-	3.9	-	7.1	-	19.8	-		-		13.4	

All \$ are in millions.

Proj - 1 PE#0604329A Modernized HELLFIRE.
 Proj - 2 PE#0602303A Missile Technology. Project D263 FMTI.

Recent Contracts

No information has been released concerning FMTI contract awards. Work is performed by the US Army Aviation & Missile Command (AMCOM), Research, Development, and Engineering Center, Redstone Arsenal, AL. Major contractors are: Raytheon; TRW; and Lockheed Martin.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Early	1990s	US Army begins consideration of TACAWS development
	2000-2003 ^(a)	Research work under way
	2003 ^(a)	Program technology transitioned to other missile development efforts

^(a) estimate

Worldwide Distribution

FMTI is a technology base effort that is not expected to produce a complete missile system.

Forecast Rationale

No specific weapon system will be developed under the Future Missile Technology Integration (FMTI) effort. Instead, this program aims to develop advanced technologies applicable to next-generation US weaponry. Among the key technologies that FMTI will test are sophisticated clutter rejection, countermeasures

hardening, multi-mission seekers and enhanced propulsion systems and fuels. This will enable the US to commit to demonstration and validation programs for only the most promising items.

Although this program could help in the eventual development of a multi-mission missile, FMTI's near-term accomplishments will probably be more modest. One program that FMTI could feed directly into is the Modernized HELLFIRE, also called HELLFIRE III, the proposed follow-on to the existing HELLFIRE anti-armor missile. The Modernized HELLFIRE is seen as necessary since many of the missiles in the existing US inventory will begin to reach their maximum shelf life by 2010.

The Modernized HELLFIRE program could be folded into a new effort aimed at developing a Common Missile System. The CMS would provide a

replacement for not only the HELLFIRE but the BGM-71 TOW anti-armor missile as well. Whether the United States develops a single missile, a single guidance system for installation on two different airframes, or two distinct missiles remains to be seen.

No matter what, the United States will have to do something to meet its anticipated anti-armor needs. The US Army plans to begin development of the Modernized HELLFIRE in 2003, and have the missile available for service by the 2008-2010 time frame. Should the US develop a Modernized HELLFIRE, the appearance of a multirole missile could be pushed back to the 2020s.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

Missile	(Engine)	thru 00	High Confidence Level				Good Confidence Level				Speculative		Total 01-10	
			01	02	03	04	05	06	07	08	09	10		
NOT SELECTED														
US MULTI-MISSION	UNSPECIFIED	0	0	0	0	0	0	0	0	0	168	327	495	
Total Production		0	0	0	0	0	0	0	0	0	168	327	495	