



FUTURE ARMAMENT SYSTEMS TECHNOLOGY



Project Manager for Tank Main Armaments

Advanced Tank Cannon (ATAC) System

The ATAC System consists of the XM291 Gun the XM91 Autoloader and autoloader controller, and an improved Fire Control and Stabilization System.

XM291 GUN

XM291 Gun fires both 120mm and 140mm ammunition by way of a simple tube change

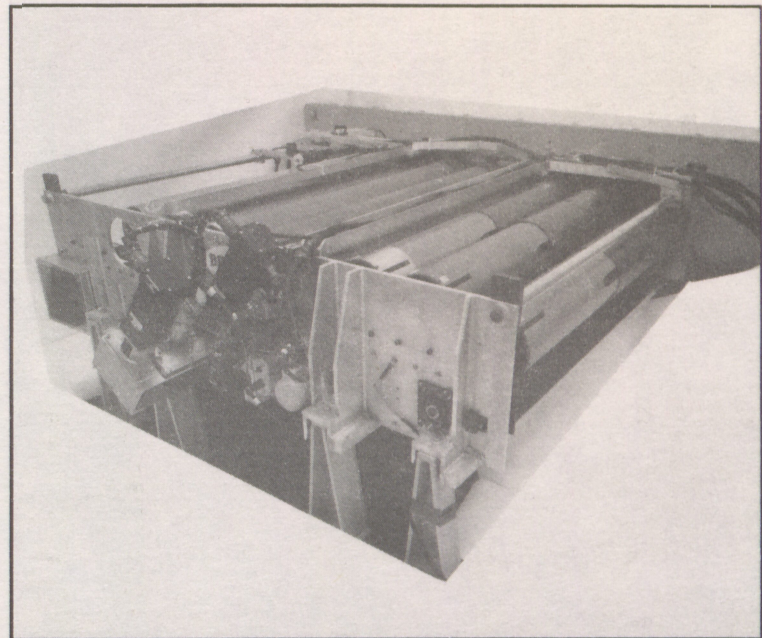


The XM291 Gun is a solid propellant tank cannon with an integral mount and recoil mechanism. The 120mm tube has the same chamber volume as the M256 but the additional 5 ft length results in increased performance. The 140mm tube is identical in length to the 120mm version but has twice the chamber volume. This increased chamber volume generates twice the muzzle energy as the standard 120mm M256 tube.

XM91 Bustle Autoloader

XM91

The XM91 offers automatic loading, inventory management, downloading and rearming functions

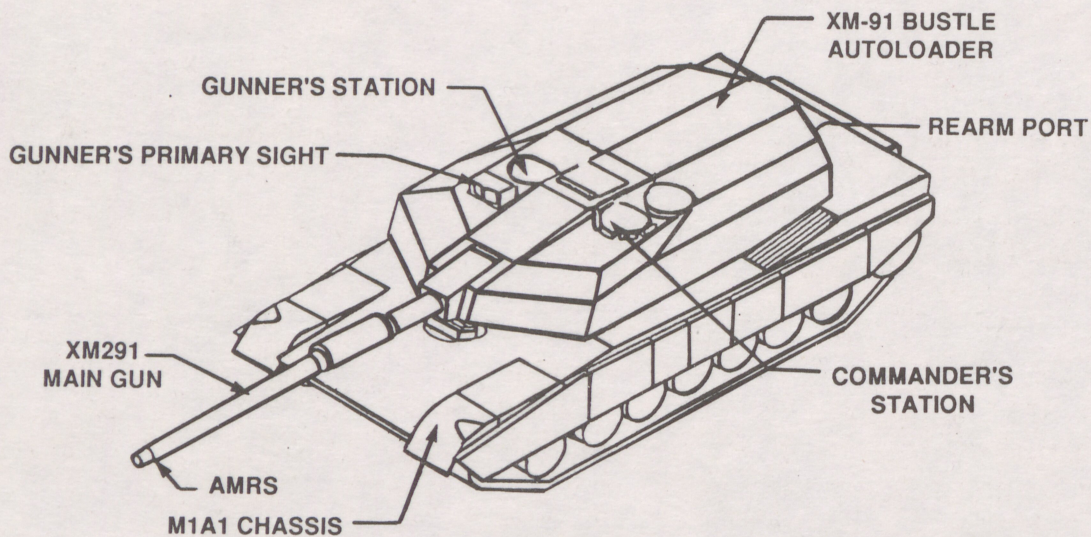


The autoloader controller controls all XM91 autoloader system functions. During loading, the selected ammunition type is identified and the telescoping cell containing that cartridge is rotated to the ram port. The gun goes to load angle and is locked in place. The blast door opens and the inner cell of the autoloader extends to the breech of the gun. The rammer mechanism grips the round by the rim of the stub base, moves through the cell and seats the round in the chamber. The inner cell and rammer retract, the blast door and breech mechanism close and the gun is ready to fire. Unloading of the gun is accomplished in the reverse order. The bustle also contains a rearm port to permit external loading of the autoloader. This is accomplished by means of the rearm switch panel located at the rear of the turret.

The Advanced Tank Cannon (ATAC)
System Demonstrator Vehicle

ATAC System Demonstrator

GENERAL VEHICLE LAYOUT



A modified M1A1 Turret was designed, fabricated and mated to an M1A1 chassis at Anmiston Army Depot. The turret contains an XM91 Gun installed through the front, an XM91 Bustle Autoloader, an autoloader controller, and a modified fire control system which includes an automatic muzzle reference system and an improved stabilization system. The weapon system is operated by a touch screen panel called the Commanders Display Panel. After turret integration was completed, the vehicle was shipped to Aberdeen Proving Ground for testing. The proof of Principle Demonstration included static firing (120mm manned and 140mm remote) and dynamic manned firing of 120mm ammunition, all autoloader. Approximately three hundred rounds were fired during this test phase. Results are compatible to M1A1 performance for hit probability, but with greater penetration.

Penetration performance was demonstrated during FTMA Armor Testing. The 140mm XM964 APFSDS cartridge defeated all SNR targets representing FST III. Increased 120mm lethal range was also demonstrated simply by firing the M829A1 APFSDS Cartridge from the XM291 Gun.

Future Plans

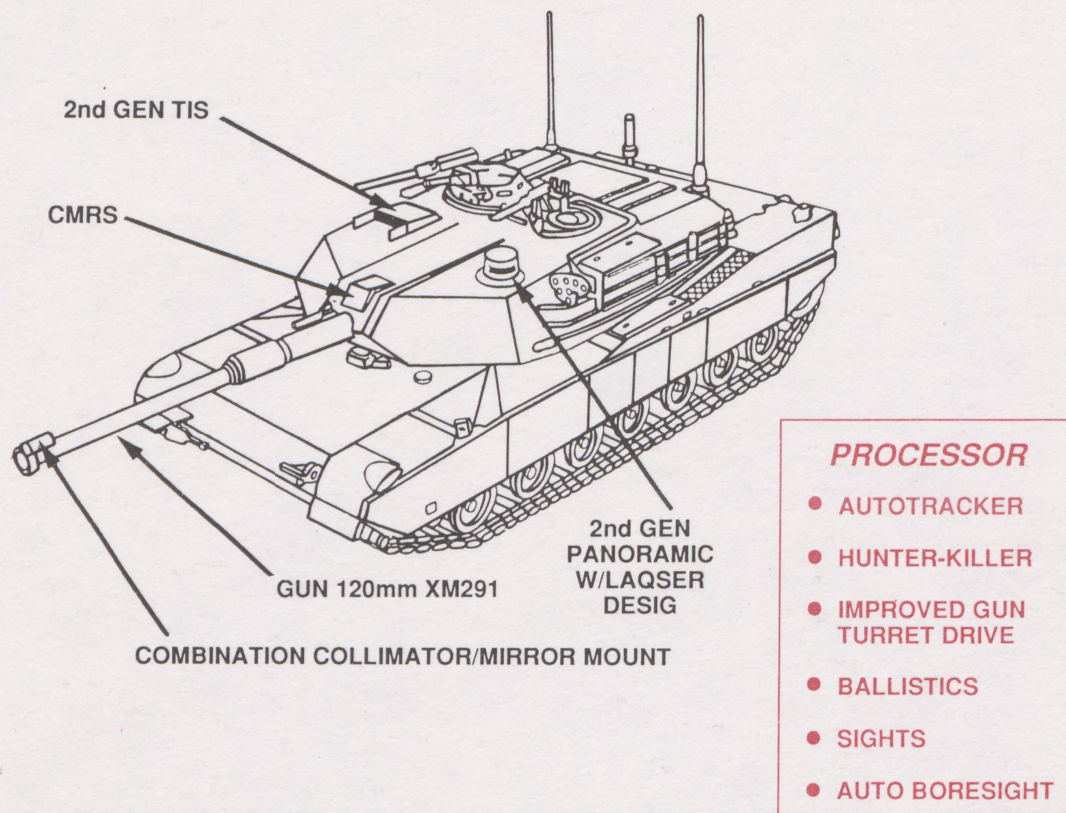
XM291 Gun: Continue activities leading to a Safety Certified 120mm Gun in 4Q FY96. Two electro thermal cannon (ETC) compatible XM291 Guns are available for test. The objective in this area is to increase target defeat ranges and to demonstrate ETC compatibility. Firing demonstrations with M829A2 and M830A1 are also planned.

ATAC Ammunition: EM&D activities for the 140mm cartridges were precluded by Congress in FY91. Work in this area is limited to characterization of ammunition technologies for potential application to the 120 system. The objective of this effort is to increase the range/lethality of solid propellant ammunition and maintain our technological advantage.

Advanced Tank Armament System (ATAS)

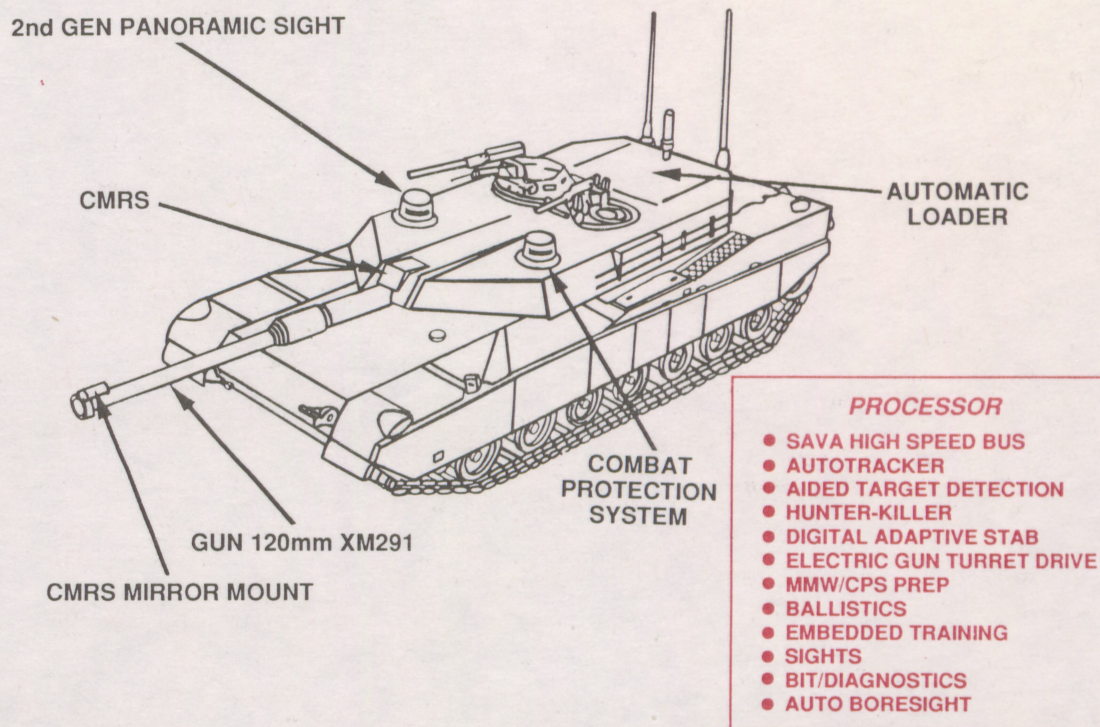
General: During FY91 the ATAS Program was structured to support the 6.3B and 6.4 Phases of the Block III Tank Program. With the deferral of that program, the ATAC program was restructured to continue critical armament system technology development with increased tank firepower effectiveness at extended ranges. The program addresses this problem by attacking its three components: acquiring the target, hitting the target and defeating the target, all at extended ranges. The program is structured to incorporate emerging technologies for evaluation through demonstrations on advanced technology demonstrators (ATDs). Given successful demonstration such technologies are available for insertion into the development stream for application to either the current or future Tank Fleet.

Abrams Improvement Program (ATD)



ATAS ATD I: This program initiated in October 1992 will demonstrate the integration of maturing technologies within current Abrams physical constraints and demonstrate increased acquisition, lethality and hit probabilities. Components to be included on an M1A2 Vehicle include the 120mm XM291 Gun, 2nd generation FLIR Technology for both commander's and gunner's sights with an integrated laser designator, autotracking and hunter-killer capability. Demonstration is planned for 4Q FY94.

Extended Range Gunnery Fire Control (ATD)



ATAS ATD II: This program was initiated in FY91 as the Extended Range Gunnery (ERG) Fire Control Demonstration System. Its goal is the acquisition of targets and control of the weapon to extend ATD I hit probabilities. It is the only Army Technology Program that will develop fire control solutions for extended ranges for direct fire ground combat vehicles. This system is the first demonstration of the Standard Army Vetrionics Architecture (SAVA) and serves as a stepping stone to increased target acquisition and hit probability. ERG components are available for laboratory integration. A full ATD demonstration is planned for 3Q FY95.



*Readers are invited to direct any
questions or comments on this brochure to:*

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