LIGHTWEIGHT 155MM HOWITZER (LW 155)

Program Description

A cornerstone of the PM Towed Artillery Systems (PM TAS) portfolio is the "Triple Seven," or the M777A2 Lightweight 155 mm Howitzer. Produced by BAE Systems in the United Kingdom, the Lightweight 155 is a Marine Corps led Joint program with the Army. The M777A2 replaces the Marine Corps' aged M198 155 mm weapons.

The M777A2 is capable of firing standard (unassisted) projectiles to a range of 15 miles (24 kilometers), assisted projectiles to 19 miles (30.5 kilometers), and the Excalibur munitions to ranges in excess of 25 miles (40 kilometers).

The world's first artillery weapon to make widespread use of titanium and aluminum alloys, the lightweight M777A2 can be air-lifted into remote high-altitude locations inaccessible by ground transportation and is capable of being transported by the Marine Corps' V-22 Osprey as well as medium and heavy-lift helicopters.

Program Status

There are currently 1,071 M777 howitzers on contract: 511 for the Marine Corps and 488 for the Army, with the remaining targeted for foreign military sales. To date over 925 of these systems have been fielded. Full Operational Capability for the USMC was achieved in June 2011.

The M777 Program plans to "refresh" the system's digitized fire control system. Described as a leap-ahead, towed artillery technology, the digital fire control has transformed how Marines employ artillery.

LW155's Top Three Program Technology Issues:

1. Modular Artillery Charge Systems (MACS) Compatibility with the M777A2 Howitzer

The Joint PM-TAS has pursued a dual path to address compatibility issues with the M232A1 propelling charge. The primary path was to have Benet Labs redesign the breech and Primer Feed Mechanism (PFM) components to survive MACS loading. The secondary path was to pursue a laser ignition system, which will be designed to handle the MACS load. PM-TAS has down selected and recently qualified the redesigned breech and PFM. Retrofit of these components will commence in 2013.

2. Power Upgrades

The power system of the digital fire control is inadequate to support the type of operations required in Afghanistan. The full combat potential of a digitized M777A2 is not being realized because of the current limitations associated with the power system. PM-TAS is currently qualifying an Improved Power Condition and Control Module, which will be retrofited to all howitzers, which will resolve the majority of these issues. PM-TAS is also working to identify a replacement for the current lead acid batteries. This Enhanced Power Pack will replace lead acid batteries, further enhancing the power system.

3. Thermal Warning Device Reliability

The current mercury thermal warning device used to measure the outside diameter temperature of the gun tube has accuracy and durability issues. After a critical field failure at Ft. Bragg, PM-TAS began looking into replacing the mechanical device with an electronic thermal warning device. PM-TAS and Benet Laboratories have developed an electronic replacement that is currently finishing qualification. Retrofit of all M777A2 howitzers will commence in 2013. A planned improvement will integrate the electronic version with the howitzer's Digital Fire Control System.

Lightweight 155 Howitzer

Mission:

Provide direct, reinforcing, and general support fires to maneuver forces. Direct support artillery for the Stryker Brigade Combat Teams. Replaces the M198 howitzer as the general support artillery for light forces in the Army. Replaces all howitzers in all missions in the USMC.

Capability / Improvements:

Improved lethality & strategic deployment

Increased tactical mobility & reliability

Improved Survivability (decreased emplace/displace time -- shoot and scoot tactics with digital fire control)

Digitizes Army and USMC towed artillery

First artillery platform with Excalibur capability fully embedded

Requirements:

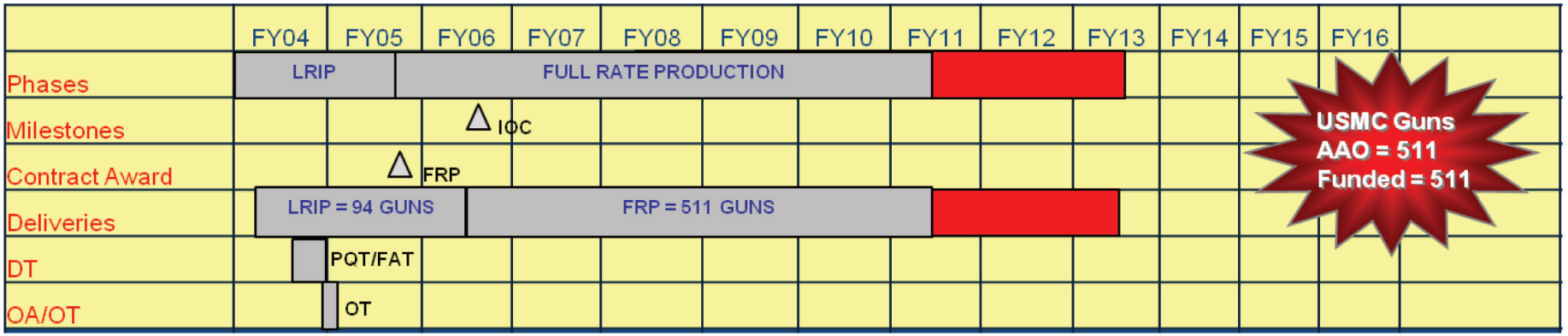
Weight	10,000 pounds or less
Emplace, Displace	<3 min, 2-3 min
Maximum Range	30 km (assisted)
Rate-of-Fire	4/min max, 2/min sustained
Prime Mover	Current 5T truck, FMTV, MTVR
Air Mobility	MV22, CH53D/E, CH47D
Fire Control	Digital & Optical
Precision Fire	Excalibur Capable & PGK Capable

Program Status:

- Nov 04 JORD – All KPP's Met
- Joint USMC/Army Program in Full Rate Production
- >700 Weapons Fielded to USMC and Army
- All Weapons M777A2 (Excalibur Capable)
- Used Very Effectively in OEF & OIF
- FMS Case with Canada & Australia; India FMS Case Expected FY12

	IOC	FOC	AAO	AAO Funded	AAO Unfunded
USMC	Dec 05	Jun 11	511	511	0
Army	Oct 06	Jun 14	542	488	54

Lightweight 155 Howitzer



LW 155 Technical Issue #1
Modular Artillery Charge (MACS) Compatibility

LW155	2012	2013	2014	2015	2016	2017	2018
Program Milestones/ Insertion Points	FRP →						
Active and Potential Investment Opportunities	The JPMO is pursuing an initiative to address Modular Artillery Charge (MACS) Compatibility.						
D&I E&D FNC SBIR Other TARDEC							
Concept to Capability Issue Mapping Alignment Process	MCCL 4.3 → MCGL 15-3.2-G17 → STO'S Fires STO-1 → Technology N/A → Venues → TTA → POM Funding → T MCTL MCT 3						

Funding Profiles ($M)	FY 12	FY 13	FY 14	FY15	FY 16	FY 17	FY 18
S&T (6.2 / 6.3)							

6.1 ← → Science & Technology ← → 6.3 6.4 ← → System Development ← → 6.7

LW 155 Technical Issue #2 Power Upgrades

LW155	2012	2013	2014	2015	2016	2017	2018
Program Milestones/ Insertion Points	FRP →						
Active and Potential Investment Opportunities	The JPMO is pursuing an initiative to replace the power distribution system and the batteries with advanced components that would eliminate this problem.						
D&I E&D FNC SBIR Other TARDEC							
Concept to Capability Issue Mapping Alignment Process	**MCL** F.02 M.01 → **MCGL** 15-3.2-G17 → **STO'S** Fires STO-1 → **Technology** - N/A → **Venues** N/A → **TTA** → **POM Funding** → T **MCTL** MCT 3						
Funding Profiles ($M)	**FY 12**	**FY 13**	**FY 14**	**FY15**	**FY 16**	**FY 17**	**FY 18**
S&T (6.2 / 6.3)							
6.1 ←	**Science & Technology**		→ **6.3**		**6.4** ←	**System Development**	→ **6.7**

LW 155 Technical Issue #3
Thermal Warning Device Reliability

LW155	2012	2013	2014	2015	2016	2017	2018
Program Milestones/ Insertion Points	FRP →						
Active and Potential Investment Opportunities	The JPMO is pursuing an initiative to address Thermal Warning Device Reliability.						
D&I E&D FNC SBIR Other TARDEC							
Concept to Capability Issue Mapping Alignment Process	MCCL 4.3 → MCGL 15-3.2-G17 → STO'S Fires STO-1 → Technology N/A → Venues N/A → TTA → POM Funding → T MCCL 4.3 → MCTL MCT 3						

Funding Profiles ($M)	FY 12	FY 13	FY 14	FY15	FY 16	FY 17	FY 18
S&T (6.2 / 6.3)							

6.1 ← → Science & Technology ← → 6.3 6.4 ← → System Development ← → 6.7