

LIGHTWEIGHT 155MM HOWITZER



Program Background

A cornerstone of the PM Towed Artillery Systems (PM TAS) portfolio is the “Triple Seven,” or the M777A2 Lightweight 155mm Howitzer. Assembled by BAE Systems in Hattiesburg, MS, the Lightweight 155 is a Marine Corps led joint program with the Army. The M777A2 replaced the Marine Corps’ outdated M198 155mm weapons.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 1,090 M777A2 howitzers: 481 for the Marine Corps and 518 for the Army, with the balance for foreign military sales customers

Canada and Australia. To date, more than 1050 of these systems have been fielded, with the remaining quantity supporting ongoing Army fielding. The final USMC M777A2 was fielded in April 2014 with Full Operational Capability achieved in June 2011.

The M777 Program has commenced activities 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. As part of the refresh effort, a new Gunners and Assistant Gunners Display (GD/AGD) commenced fielding in 2014. Using recent advances in display technology, the display has greater reliability along with greatly improved sunlight readability at a lower overall cost. Other ongoing refresh initiatives include a new Mission System Computer, Chief of Section Display, and power supply.

LW 155’s Top Technical Issues:

1. Safe and Transportable Battery High Capacity Technology

The M777A2 howitzer powers its electronics with onboard (rechargeable) batteries. The current platforms have power requirements in excess of 2 KWH. Current High Capacity Battery technologies are mainly Lithium Ion based, which requires extensive regulatory qualification testing when the power pack exceeds 1 KWH. As a result, towed artillery Program Managers seeking improved battery performance are required to execute significant development efforts (at significant expense) to design and qualify “system specific” power packs. To mitigate this, PMs request that industry invest in safe and transportable battery technology that could be implemented into weapons systems in a modular fashion, without the need for “system specific” power packs and the extensive regulatory qualification requirements that come with them.



2. Secure Wireless: Ruggedized/Low Energy

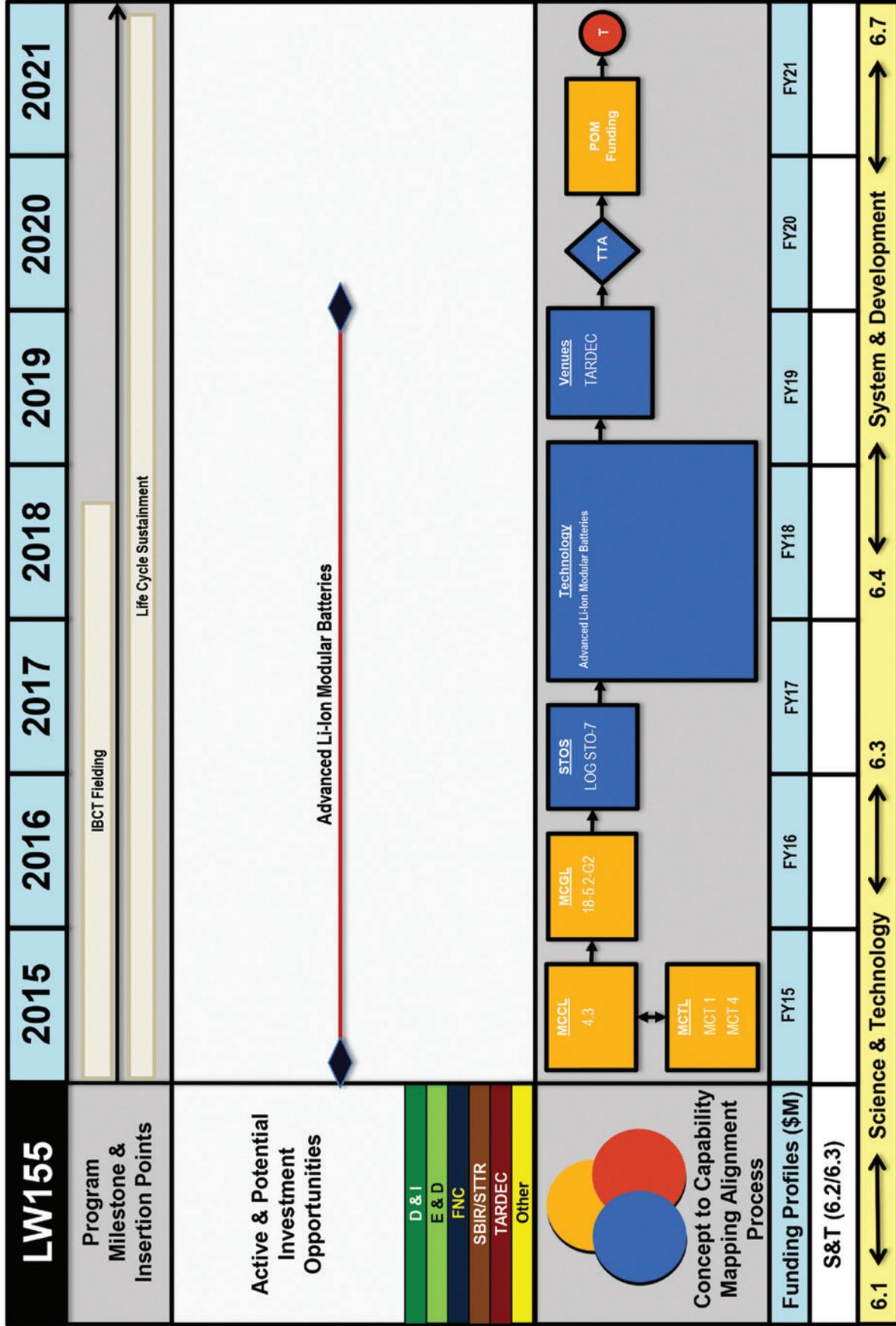
Communications between interfacing components of the M777A2 digital fire-control systems is accomplished over physical wires. The required cabling constrains the solution space and introduces points of failure, particularly for cables that need to flex or be moved as part of normal operations. A short-haul, low-energy wireless data transmission can eliminate use of physical wires. Although commercial standards exist, a ruggedized solution using a dongle-like device is required. The solution should be adaptable to enable either serial or Ethernet wireless communications between components. This technology may be incorporated into future devices such as wearable devices and onboard sensors.

3. Navigation in a GPS Denied Environment

The navigation systems for the digitized howitzers are dependent on GPS assistance to maintain full operational capability. GPS denial would degrade howitzer operational tempo and adversely impact delivery of timely fire in support of maneuver. Innovative approaches to counter or mitigate GPS denial at minimum SWaP are required. The technologies could be items such as anti-jam antennas, sensor fusion schemes to leverage other available sensors, or other technologies to establish howitzer location to better than 4m accuracy in a GPS-denied environment.



LW155 Technical Issue #1 Safe and Transportable Battery High Capacity Technology





LW155 Technical Issue #3 Navigation in a GPS Denied Environment

