

LW155 Howitzer

Towed Artillery Digitization



Presented by:

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DPM Towed Artillery Digitization

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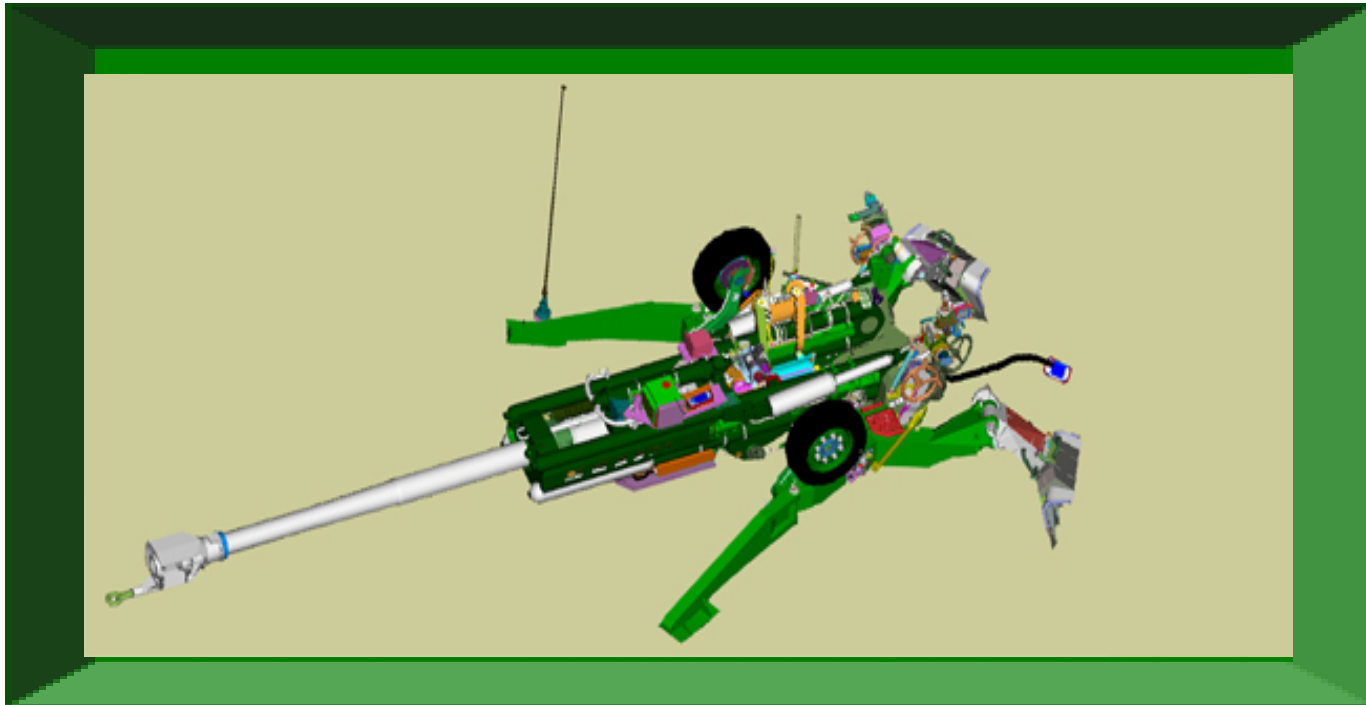
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What is **Towed Artillery Digitization (TAD)**

*An Evolutionary Acquisition Program to develop and integrate a **Digital Fire Control System (DFCS)** onto the new M777 Lightweight 155mm Howitzer*



Program Overview (1 of 2)

- **The Lightweight 155mm Howitzer (LW155) Is A Joint Program With The Marine Corps And The Army**
 - The Marine Corps Developed the Basic Howitzer
 - The Army Developed the Towed Artillery Digitization (TAD) Digital Fire Control System

- **The Marine Corps Is The Lead Service But All Milestones And Documents Are Joint**
 - ASN(RDA) is Milestone Decision Authority (MDA) for Basic Gun
 - PEO Ground Combat Systems is The MDA for TAD
 - USADTC Lead for Basic Gun and TAD Developmental Testing
 - MCOTEA Lead for Basic Gun and TAD Operational Testing

- **TAD Major Contractors**
 - Lead System Integrator – **BAE, Barrow, UK**
 - Major Subcontractor for DFCS – **GDATEP, Burlington, VT**



Program Overview (2 of 2)

- **Operation Desert Storm AAR: M198 Too Heavy, Too Slow, Aging**
- **LW155 Program Was Initiated by USMC and Army in 1996**
- **M777 Low Rate Initial Production (LRIP) Decision in Nov 2002**
 - Authorized production of 94 M777 Howitzers with Optical Fire Control for Marine Corps
 - Currently Fielded to USMC (IOC – Oct 05) and Canada (Afghanistan)
- **M777A1 used for Multi-Service Operational Test and Evaluation**
- **M777A1 Full Rate Production (FRP) Decision February 2005**
 - Authorized 495 M777A1 Howitzers with Digital Fire Control System (DFCS) for Marine Corps and Army
 - Authorized production of additional 94 DFCS for retrofit onto the 94 LRIP Marine Corps Howitzers
- **Joint Service Multiyear FRP Contract Awarded March 2005**



TAD Evolutionary Acquisition Strategy

M777

With Optical Fire Control

94 Produced for USMC

Retrofitting to M777A2



**Towed Artillery Digitization
M777A1 (Hardware & Software)**

**Aiming &
Pointing,
Navigation**

On-Board Power Supply, Radio,
Computer, GPS, INU, VMS

**GDU Protocol
Messaging**



Chief Of
Section Display



Gunner & AG
Displays

**Towed Artillery Digitization
M777A2 – Software Upgrade**

- **Limited Two-Way Joint Variable Message Format Messaging**
- Howitzer Status Message
- Becomes **Excalibur Capable** With Installation of EPIAFS Platform Integration Kit & Fuze Setter

**Towed Artillery Digitization
Objective Capability**

- **On-Board Ballistic Computation**
- Integrated Muzzle Velocimeter
- Ammo Inventory
- Full Joint Variable Message Format Messaging

The Future of Towed Cannon Artillery



M777A2 Howitzer... The Operational Benefit

M777A2 is More Mobile, Rapidly Deployable, Survivable and Accurate than the current heavy and aging M198

	<u>M777A2</u>	<u>M198</u>	<u>Improvement</u>
Weight	9,800 lbs.	16,000 lbs	39%
Emplaces	2:10 min	6:35 min	304%¹
Displaces	2:23 min	10:40 min	448%^{1 & 2}
Terrain Trafficable	83%	63%	32%
C-130 Load	2	1	100%
Digitized	Yes	No	70%²
Excalibur Ready	Yes	No	One Round Kill

¹ **Contributes to 5 Times the Kills**

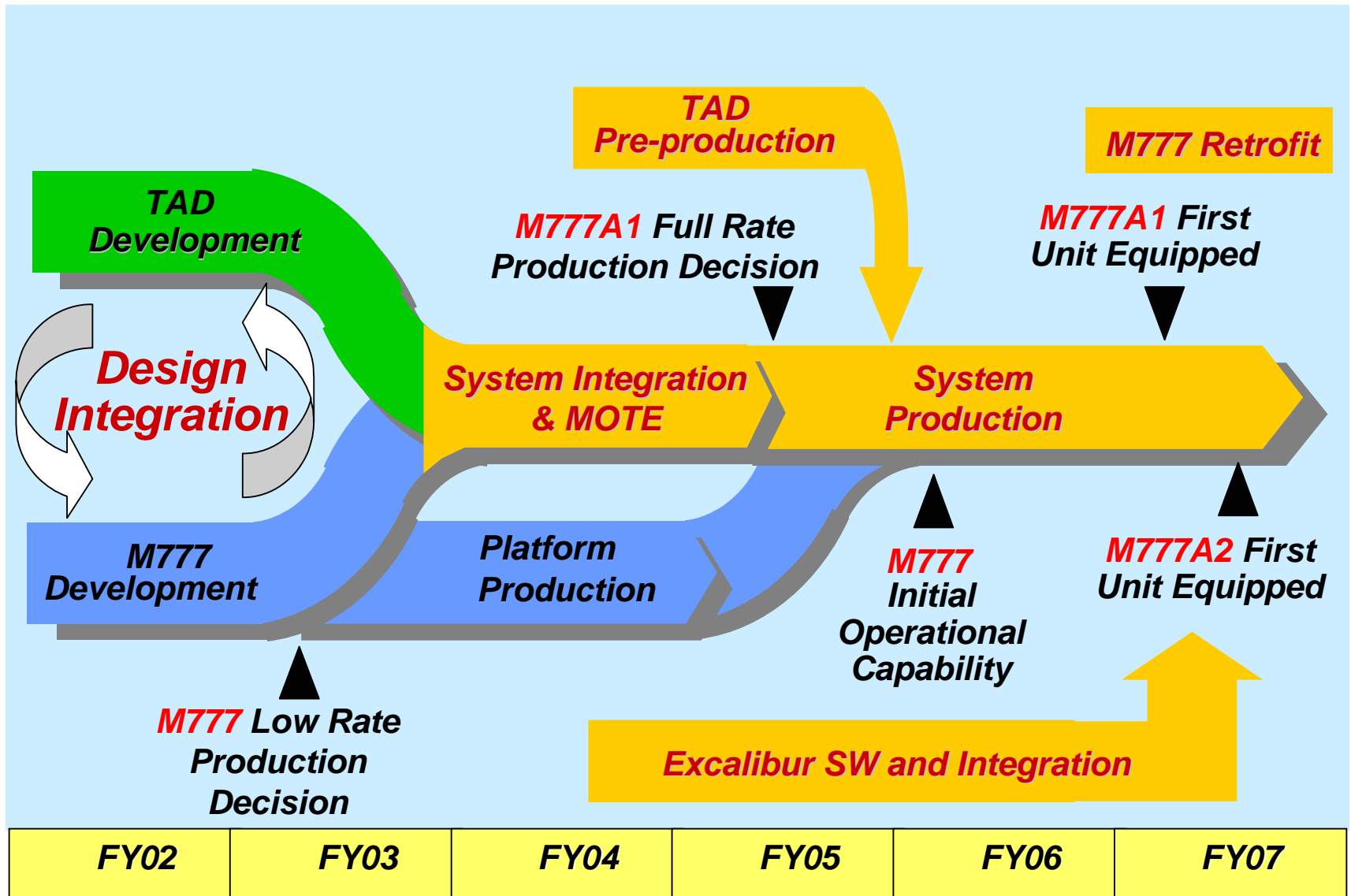
² **Contributes to 70% Increase in Survivability**



MERGING OF Multiple DEVELOPMENT PATHS

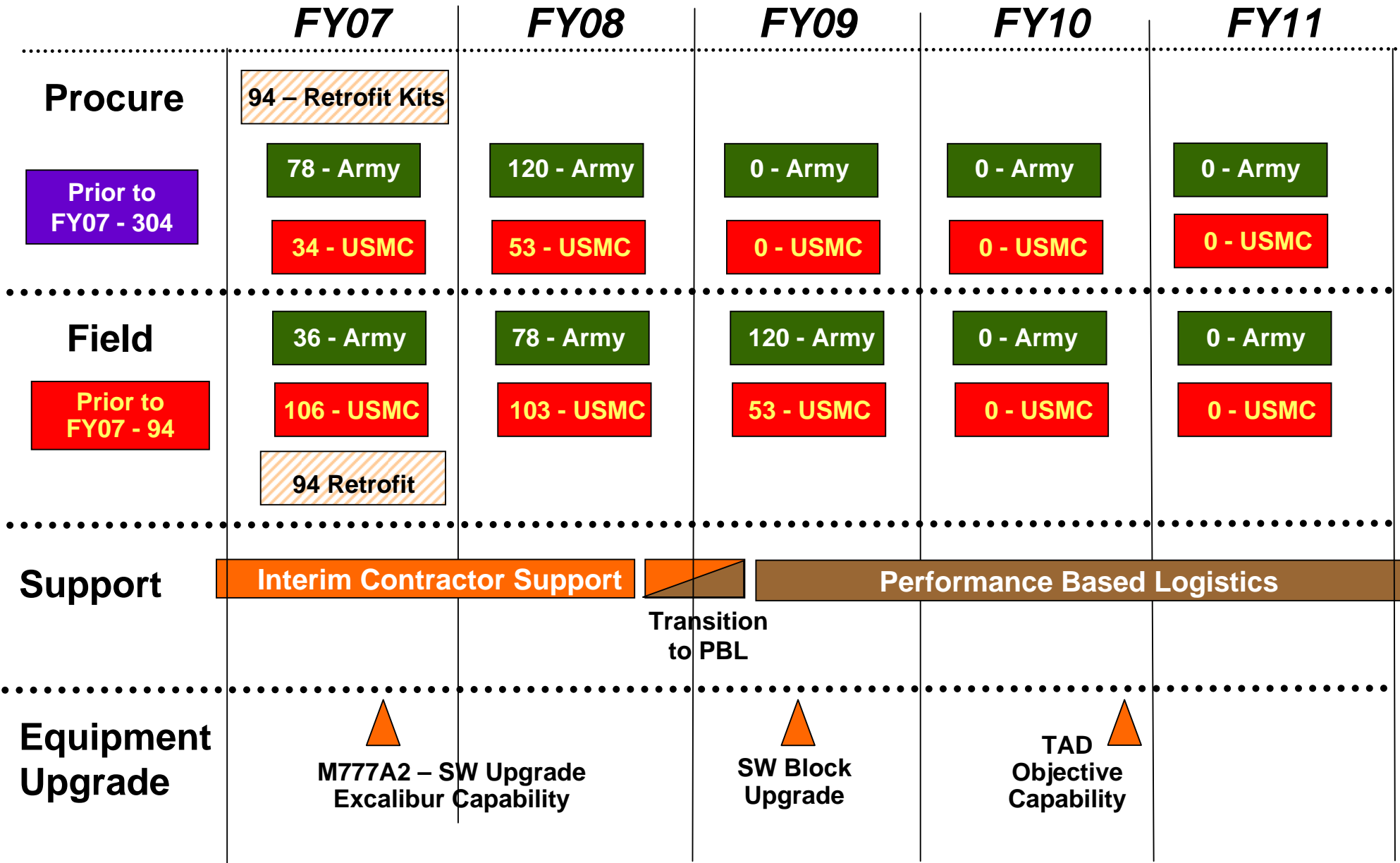
M777A1 = M777 Howitzer + Towed Artillery Digitization

M777A2 = M777A1 + Software Upgrade



LW155 Howitzer Program

**Total Procured : USMC – 356
Army -- 233**



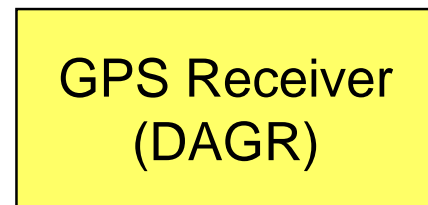
Prior to
FY07 - 304

Prior to
FY07 - 94

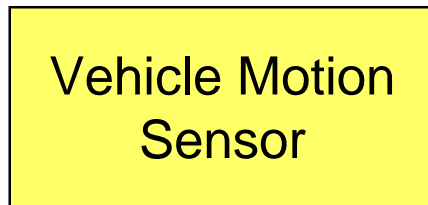


The “Heart” of TAD Position Navigation System

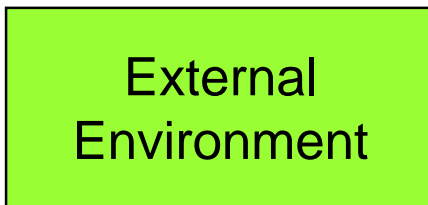
INPUTS



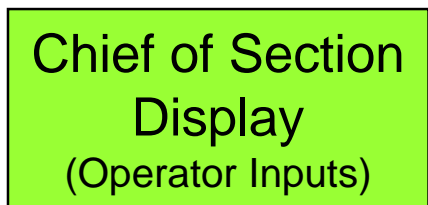
Position
(Lat, Long, Alt)



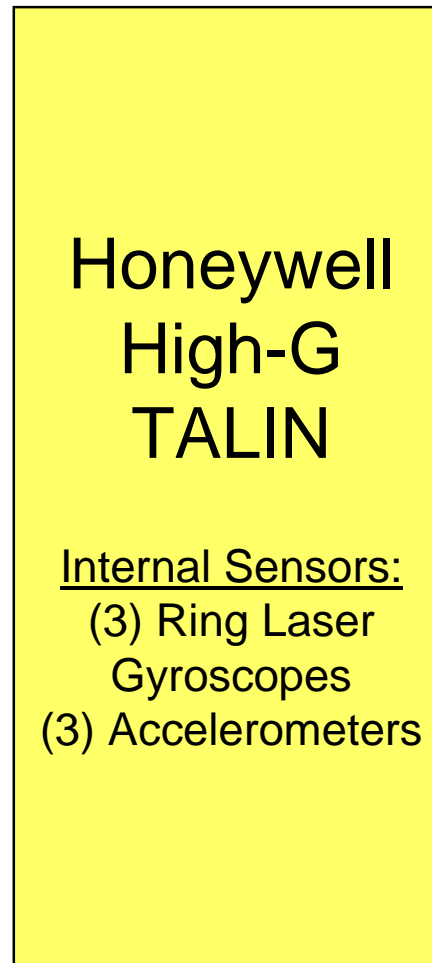
Velocity
(Vehicle Speed)



Inertia Measurement
(Earth Rotation,
Gravity, Gun Rotation)



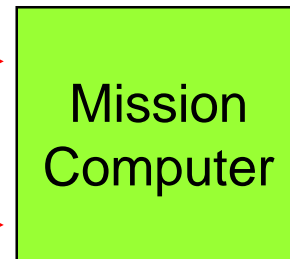
Position
(Lat, Long, Alt)



OUTPUTS

Position
(Lat, Long, Alt)

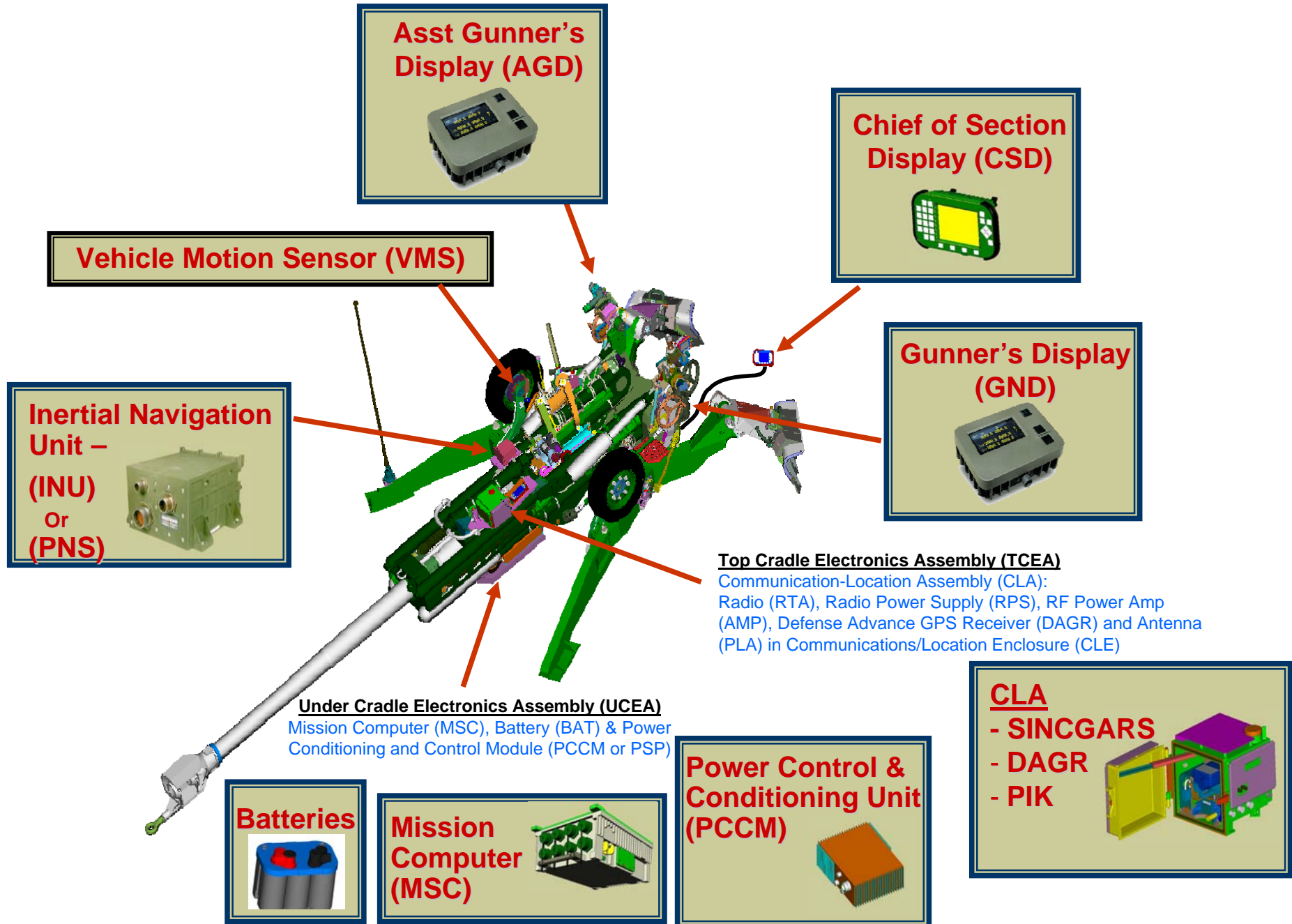
Orientation
(Az, QE, Cant)



Indicates PNS Component



M777A2 Towed Artillery Digitization (TAD)



LW155 Howitzer Prime Mover Integration

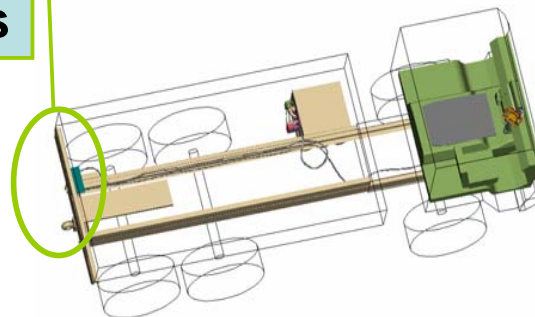
Applicable Prime Mover Families

FMTV

M1083
M1083A1
M1093

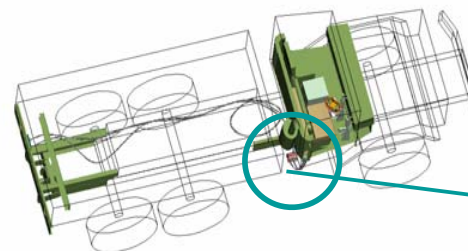


Rear
Connectors



M939

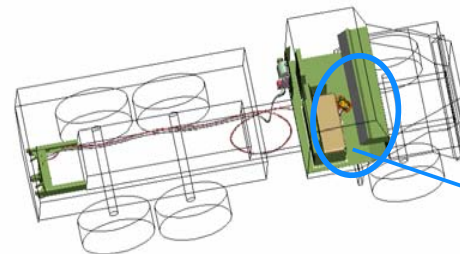
M925
M925A1
M925A2



Power
Hookup

MTVR

MK 23



CAB Mount
for CSD



LW155 & TAD – “The Challenges”

- **Joint Program** – *2 MDA’s...ASN(RDA) & Army PEO*
- **Decision to Merge TAD & M777** - *Risk to execution*
- **Consolidation of 2 Prime Contractors** – *BAE and GD*
- **Multi-Service Operational Test** – *2 Independent Evaluators*
- **Joint Full Rate Production Milestone** – *Tailoring the Process*
- **Transitioning Development to Full Rate Production**
 - *Pre-production in parallel with Production Planning*
 - *Incorporating Lessons Learned from MultiService Oper Test*
 - *Obsolescence Management*
 - *Integrating Excalibur Capability in mid-stream*
- **Planned Retrofit of TAD Concurrent with Initial Fielding**
- **Moving from M777A1 to M777A2 with Initial Fielding**
- **Managing the Changing Interfaces**



LW155 Howitzer Bottom Line

- ✓ RDTE and LRIP Complete...Program is in Full Rate Production
- ✓ M777 Initial Operational Capability (IOC) Dec 05 with USMC
- ✓ Initial fielding of Digitized M777A1 Howitzers to Army Jan 07
- ✓ Retrofit program to digitize LRIP Guns Almost Complete
- ✓ M777A2 (Excalibur Capable) Howitzers issued Apr 07

***Fielding of Digitized LW155 Underway...
Time to Start Thinking about Refresh***

