

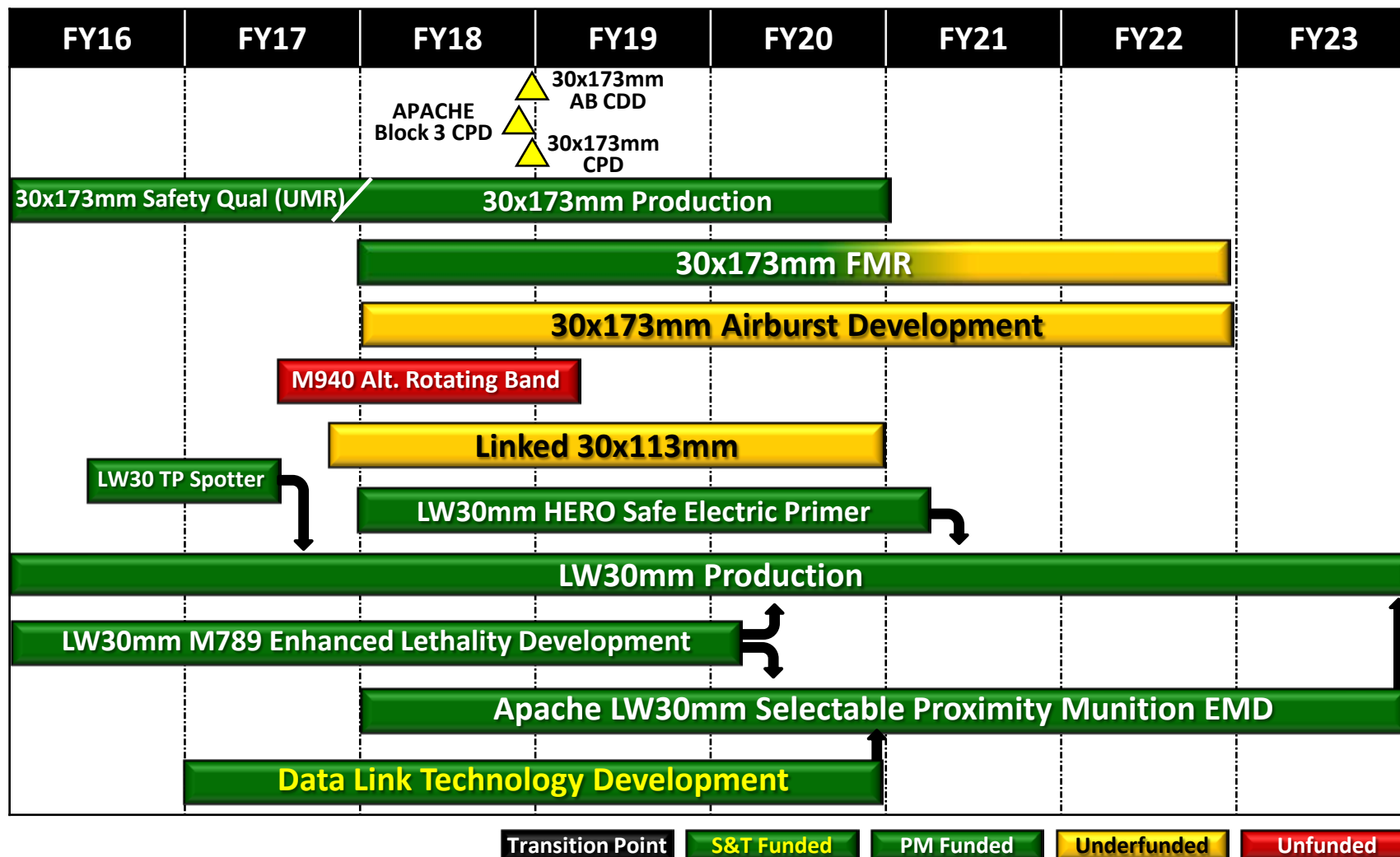
## 2017 NDIA Armament Systems Forum Firing Demonstrations (Session III Panel)

Mr. Christopher R. Seacord, Product Director  
Medium Caliber Ammunition

1-4 MAY 2017



# Cannon Caliber Ammunition Roadmap





# 30x173mm Full Material Release for Stryker



## Description

- Follow-on program from Stryker 2CR urgent materiel release
- Qualify two different contractors' versions of HEI-T, TP-T, APFSDS-T, and TPDS-T ctgs.

## Capabilities

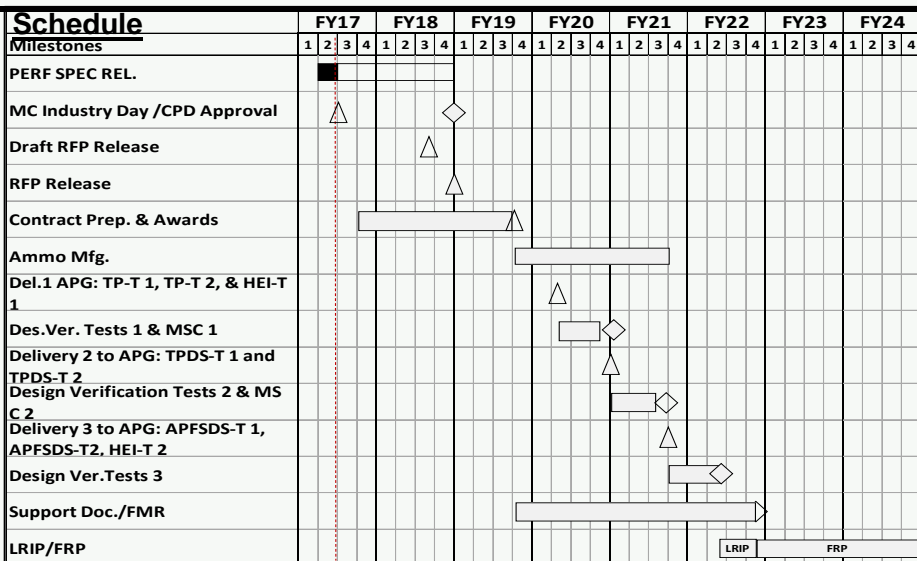
- Provide Stryker ICV Vehicle increased lethality against personnel and materiel targets
- Develop two suppliers for competitive procurement

## Recent Milestones or Events

- JAN 17 – Initiated preparation of performance specifications
- MAR 17 – Medium Caliber Ammunition RDT&E Industry Day

## Near Term Milestones or Events

- MAY 17 – Release Market Survey
- JUN 17 – Complete Cost Benefit Analysis



## Challenges/Opportunities

- Working with HQDA to fix FY21-22 Unfunded Requirements

**FY18 DOTC Initiative: AMM-18-37**



# 30x173mm Programmable Airburst



## ■ Description

- Conduct competitive Engineering, Manufacturing, and Development (EMD) to field airburst capable ctg. and programming unit which interfaces with Stryker Infantry Carrier Vehicle (ICV) and XM813 weapon system

## ■ Capabilities

- Provide Stryker ICV Vehicle with new capability against personnel in defilade and increased lethality against personnel targets in the open

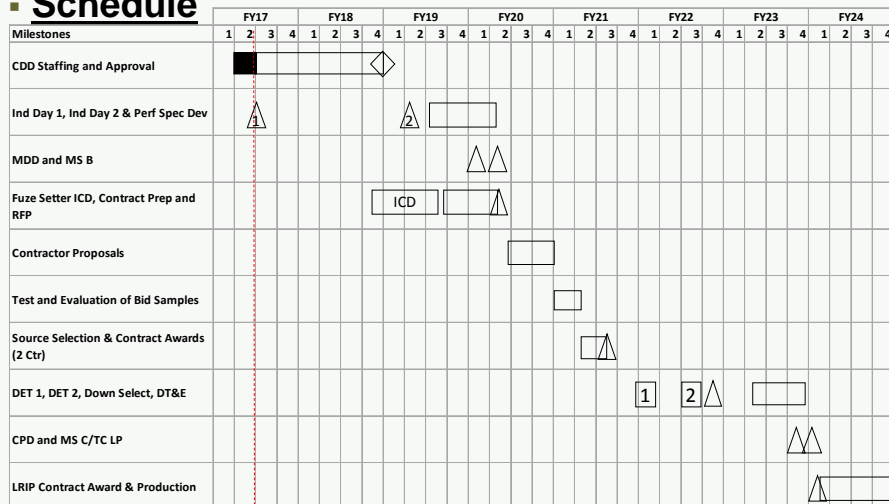
## ■ Recent Milestones or Events

- JAN 17 – Draft Capability Development Document (CDD)
- MAR 17 - Medium Caliber Ammunition RDT&E Industry Day

## ■ Near Term Milestones or Events

- JUN 17 – Release Market Survey
- JUL 17 – Complete Cost Benefit Analysis

## ■ Schedule



## ■ Challenges/Opportunities

- XM813 weapon integration of potential proprietary data associated with airburst fuze programming/communication protocol software
- POM 19: Funding for EMD and production

**FY18 DOTC Initiative: AMM-18-23**





# HERO Safe Electric Primers



## Description

- HERO safe electric primers are electro-optical ignition devices that utilize Commercial Off The Shelf (COTS) sub-miniature laser diodes as ignition mechanism to initiate modified energetic train to fire munition
- Laser electronics are small enough to fit within volume of a normal primer while being competitive in cost to existing systems
- Laser electronics assemblies are designed to utilize firing pulse of host weapon system while withstanding RF and ESD environments found on battlefield

## Capabilities

- Design layout and size enable assemblies to withstand exposure to MIL-STD-464C specified electromagnetic fields and personnel borne electro static discharge and remain functional
- Designs have additional safety in removing any energetics from contact with electronics

## Recent Milestones or Events

- FEB 16 – Prototype assemblies passed RF & ESD exposure testing
- MAR 16 – Patent US 9,273,942 B1 issued for basic technology concept
- OCT 16 – 30mm ctgs. successfully fired at temperature extremes with all items meeting production action time requirements

## Near Term Milestones or Events

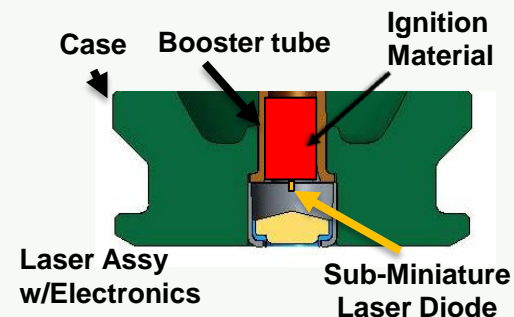
- 4QFY17 – Maturation contract award for 30mm application
- Exploration of other applications planned for FY17 but are dependent upon ARDEC budget release

## Schedule

	FY17				FY18				FY19				FY20				FY21				FY22			
Milestones	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
30mm Maturation																								
RFP Release																								
Task Award																								
Electronics Assembly																								
Energetics																								
Production Integration																								
Verification																								
ECP																								
Other Applications																								

## Challenges/Opportunities

- High volume production of laser electronic assemblies
- High volume production of light sensitive energetic materials
- Adaptation to other existing electric ignition devices or to new applications where electric ignition system is desirable





# LW30mm Enhanced Lethality



## ▪ Description

- Incorporate advanced projectile technologies to deliver greater lethality with controlled fragmentation, optimized fragmentation dispersal and various projectile lengths balanced with aerodynamics on existing M789

## ▪ Capabilities

- Provide Apache Gunship greater lethality against personnel targets with higher probability of defeat

## ▪ Recent Milestones or Events

- Shear liner integration, arena test and analysis
- Shape charge integration and analysis
- Delivery of embossed projectile bodies



## ▪ Near Term Milestones or Events

- 4QFY17 – Design/Build/Test 1
- 2QFY18 – Design/Build/Test 2
- 4QFY18 – Design/Build/Test 3
- 4QFY18 – TRL6 Ballistic Test & Lethality Analysis

## Schedule

	FY17				FY18				FY19			
	1	2	3	4	1	2	3	4	1	2	3	4
Milestones												
Engineering & Analysis												
Test Events												
TRL 6												

## ▪ Challenges/Opportunities

- Increasing projectile size and/or optimizing fragmentation can increase lethal area and effective range
- Higher projectile weight can provide increased range effectiveness but could trade-off short range performance



**Goal: Enhance lethality of LW30mm projectile, analyze and test several HEDP configurations**



# LW30mm Airburst



## Description

- Develop, integrate, and demonstrate a selectable proximity airburst munition for the Apache Gunship to increase lethal effects against personnel while maintaining material effects of the existing munition

## Capabilities

- Provide Apache Gunships increased precision and lethality against personnel and material targets at greater range than the existing munition
- Set round through data-link (DL) for specific target

## Recent Milestones or Events

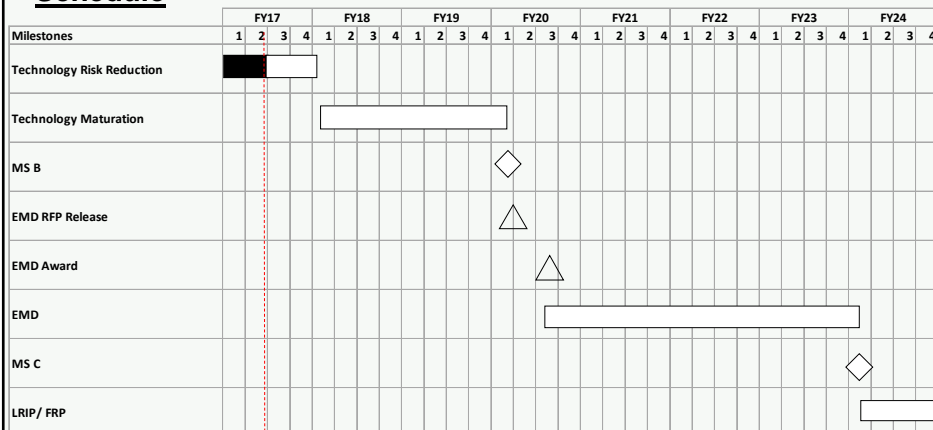
- 1QFY17 – Risk reduction fuze/selectable proximity electronics form factor
- Apache Ammunition Trade Study



## Near Term Milestones or Events

- 1QFY18 - Competitive Prototyping TRL 6 DOTC Award
- 4QFY19 – TRL6 Demonstration (Ammo/ DL/ Weapon)
- 1QFY20 – MS B
- 1QFY20 – EMD RFP Release
- 3QFY20 – EMD Contract Award

## Schedule



## Challenges/Opportunities

- Form factoring proximity sensor, safe & arm
- Data-link integration, reliability at high rate of fire
- Reduce integration/ fire-control upgrade burden through “fuze replacement”
- In-house efforts provided to industry



Goal: Integrate selectable proximity fuze within available space claim, no other changes

**FY18 DOTC Initiative: AMM-18-14**



# 30x113mm M788 TP/M789HEDP (Linked)

## Joint Light Tactical Vehicle-Recon Vehicle (JLTV-RV)

### Directed Requirement



#### ■ Description

- Conduct urgent material release of M788 TP and M789 HEDP in linked configuration (M29) use in a ground application with XM914
- Provide ammunition to support ammunition, weapon and system integration testing

#### ■ Capabilities

- Increase JLTV lethality against personnel and material targets at greater range than .50 Cal and MK19

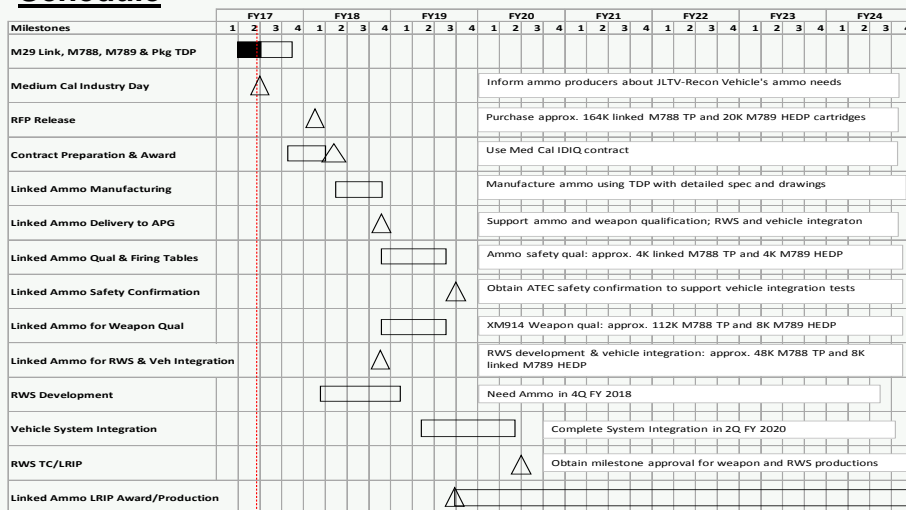
#### ■ Recent Milestones or Events

- DEC 16 – Developed lethality requirements against personnel and material targets
- JAN 17 – Developed draft program cost and schedule
- FEB 17 – Drafted CRADA w/OATK for engineering test and evaluation of XM914

#### ■ Near Term Milestones or Events

- Assist JPO-JLTV in acquisition strategy briefing with AAE
- Test and evaluation strategy and safety confirmation meeting with ATEC

#### Schedule



#### ■ Challenges/Opportunities

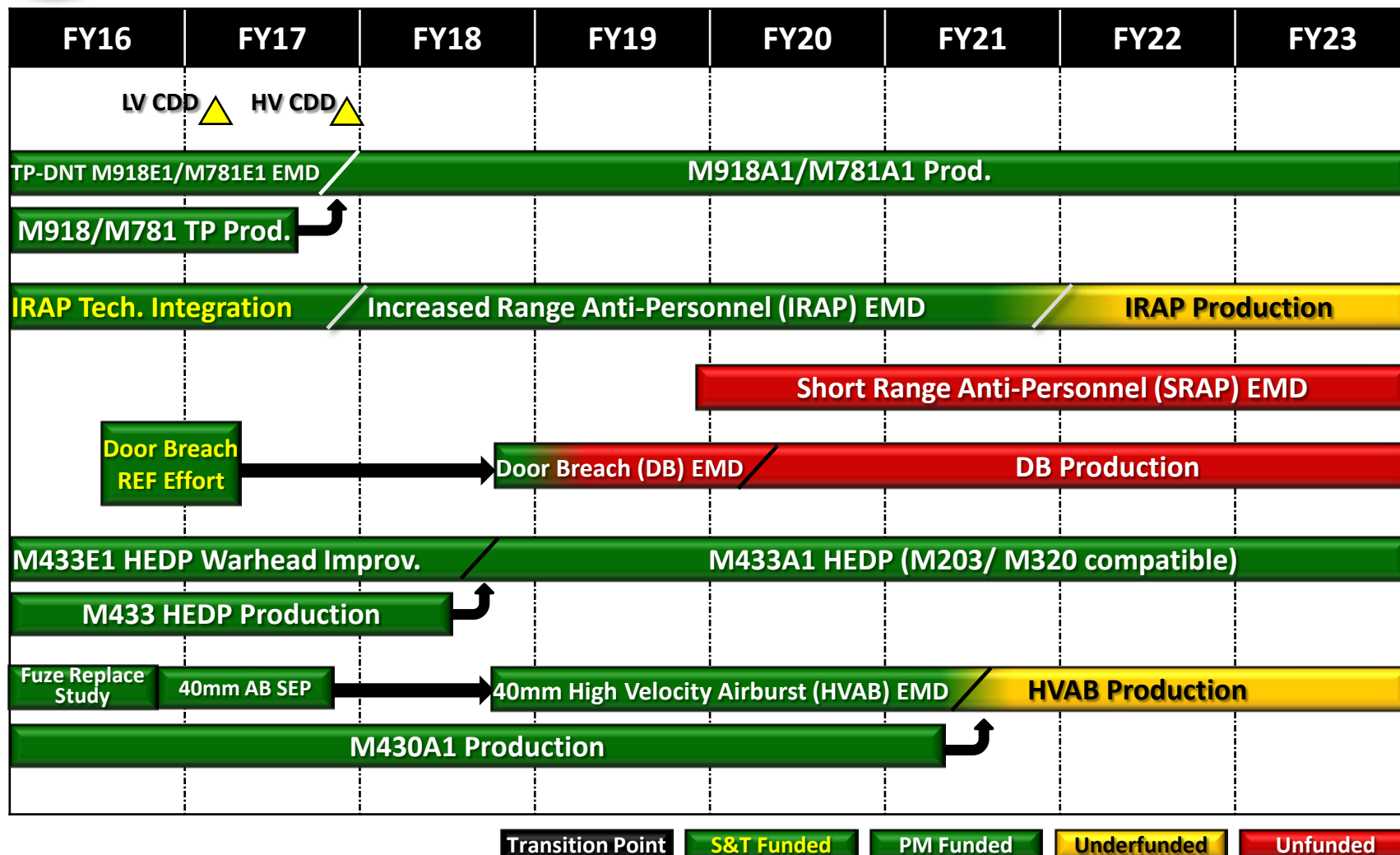
- Update/optimize M29 Link and Packaging technical data package from early 1980's
- Develop link producer(s) - domestic and/or foreign source(s)
- Potential long-term opportunity - qualify steel case

**FY18 DOTC Initiative: AMM-18-17**





# 40mm Ammunition Roadmap





# 40mm LV Grenade XM1166 High Explosive Air Burst (HEAB)



## ■ Description

- 40mm XM1166 HEAB program will provide grenadier with increased precision, lethality and range to engage personnel and material targets through incorporation of programmable/proximity fuzing, optimized fragmentation, and fire control

## ■ Capabilities

- When deployed against point and area targets, XM1166 grenade will enable grenadier to inflict incapacitating effects at increased ranges beyond current M433 High Explosive Dual Purpose (HEDP) ctg.

## ■ Recent Milestones or Events

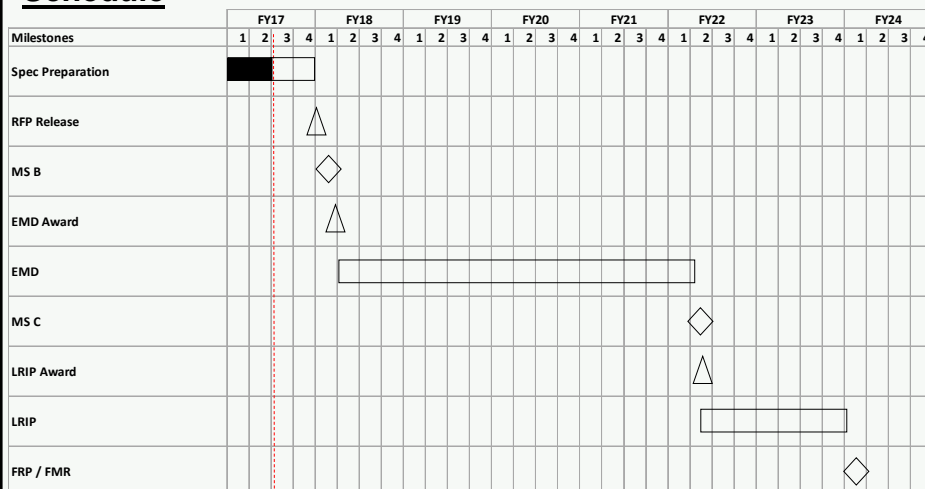
- DEC 16 - 40mm Low Velocity Family of Ammunition Capability Development Document (CDD) approved
- DEC 16 - HQDA G8 requested Materiel Development Decision

## ■ Near Term Milestones or Events

- 3QFY17 – MDD Decision
- 4QFY17 – Draft RFP Release
- 1QFY18 – RFP Release
- 2QFY18 – Milestone B



## Schedule



## ■ Challenges/Opportunities

- Weapon integration (Programing Unit)
- Balancing requirements / Managing trade space
- Resistance to jamming or Counter Radio Electronic Warfare
- Spectrum supportability
- Accurate delivery and timing of airburst
- Ruggedization of Programing Unit (if applicable)



# 40mm LV Grenade XM1168 Short Range Anti-Personnel (SRAP)



## ■ Description

- 40mm XM1168 SRAP program will provide grenadier with ability to quickly engage close range personnel threats, within 50m in an urban or open environment

## ■ Capabilities

- When deployed against enemy personnel, XM1168 grenade enables grenadier to render an enemy incapable of performing their assigned combat functions of shoot, move and communicate within one second after being impacted

## ■ Recent Milestones or Events

- DEC 16 - 40mm Low Velocity Family of Ammunition Capability Development Document (CDD) approved
- DEC 16 - HQDA G8 requested Materiel Development Decision

## ■ Near Term Milestones or Events

- 2QFY18 – Materiel Development Decision
- 2QFY19 – Milestone B
- 2QFY19 – Draft RFP Release

## Schedule

	FY17				FY18				FY19				FY20				FY21				FY22				FY23				FY24			
Milestones	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MDD					△																											
MS B									◇																							
RFP Release									△																							
EMD Award										△																						
EMD																																
MS C																		◇														
LRIP Award																			△													
LRIP																																
FRP / FMR																																

## ■ Challenges/Opportunities

- Current HEDP ammunition presents safety hazard from arming distance and fragmentation that can injure gunner
- Risk that lethality requirements against targets with body armor are new to 40mm and may require substantial projectile development
- Program funding request for POM19
- Future Market Survey for existing solutions



# 40mm LV Grenade XM1167 Door Breach (DB)



## ■ Description

- 40mm XM1167 DB program will provide small unit with ability to conduct ballistic breach of an existing door creating an entry point into a building or other urban structure

## ■ Capabilities

- XM1167 allows units to conduct a ballistic breach at ranges of up to 50m, with a single shot and without pause between breach and entry while reducing collateral damage and friendly casualties

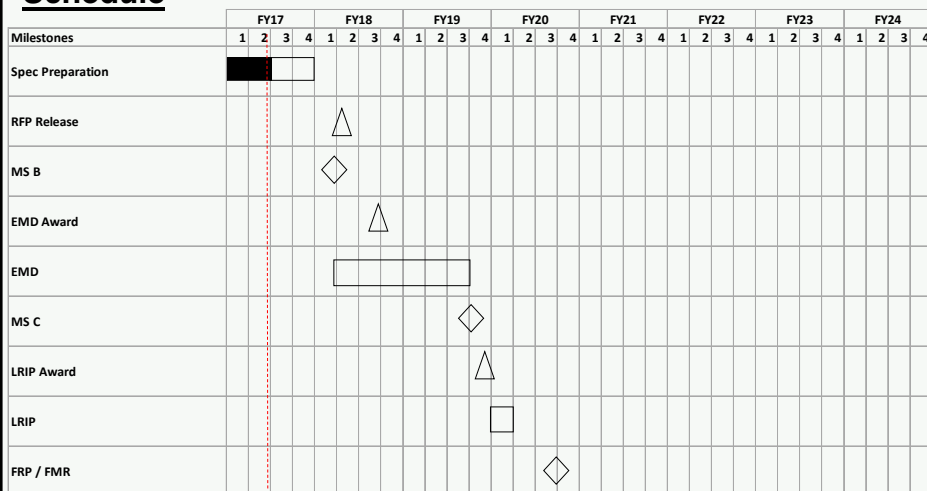
## ■ Recent Milestones or Events

- DEC 16 - 40mm Low Velocity Family of Ammunition Capability Development Document (CDD) approved
- DEC 16 - HQDA G8 requested Materiel Development Decision

## ■ Near Term Milestones or Events

- 3QFY17 – MDD Decision
- 4QFY17 – Draft RFP Release
- 1QFY18 – Milestone B

## Schedule



## ■ Challenges/Opportunities

- Hazardous fragment requirement
- Weapon compatibility
- Difficulty breaching metal out swinging doors
- Low procurement quantity in the out years
- Achieving objective requirements





# 40mm HV Grenade Improved High Explosive Dual Purpose (I-HEDP)



## ■ Description

- I-HEDP is high explosive munition that will enable gunners to effectively engage targets in the open and defilade while maintaining material effects of M430A1 HEDP and that requires no modifications to MK19 weapon system

## ■ Capabilities

- I-HEDP will provide gunners with ability of achieving increased lethal effects against enemy personnel in open and defilade and defeat of unarmored and lightly armored vehicles

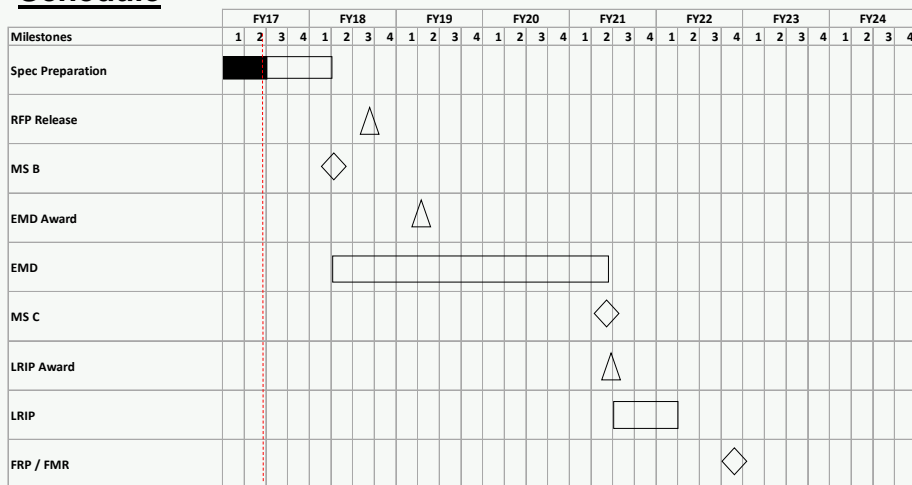
## ■ Recent Milestones or Events

- 1QFY17 - Ft. Benning HV AB contractor demonstrations
- Ongoing - Requirements development and staffing
- Ongoing - Pre-EMD Activities

## ■ Near Term Milestones or Events

- 2QFY17-3QFY17 – Release Market Survey
- 4QFY17 - 40mm High Velocity I-HEDP Capability Development Document (CDD) approval
- 4QFY17 – Material Development Decision

## Schedule



## ■ Challenges/Opportunities

- Space Claim on MK19 platform
- System resistant to jammer
- Spectrum Supportability
- Ruggedization of Programming Unit
- Integration with other Mk19 enablers



# Questions?

Following is link to Medium Caliber Industry Day:

[https://www.fbo.gov/index?s=opportunity&mode=form&id=fa8814841491f0ba10bee80f927c00dc&tab=core&\\_cview=1](https://www.fbo.gov/index?s=opportunity&mode=form&id=fa8814841491f0ba10bee80f927c00dc&tab=core&_cview=1)