

The Soldier: America's Most Deployed Combat System



# PM Crew Served Weapons Overview

**2005 Small Arms Symposium & Exhibition**  
***National Defense Industrial Association***

**18 May 2005**

**LTC Kevin P. Stoddard**  
**PM Crew Served Weapons**



# PM Soldier Weapons Programs List



## DEVELOPMENT

### **WEAPONS**

Objective Individual Combat Weapon (OICW)

1. OICW Increment I
2. OICW Increment II - XM25 Air Burst Weapon

Advanced Crew Served Weapons (ACSW)

3. XM307 (25mm)
4. XM312 .50 Cal Machine Gun Variant
5. XM101, CROWS, Remote Mount

### **SOLDIER ENHANCEMENT PROGRAMS**

6. XM26 - 12 Gauge Modular Accessory Shotgun System (MASS)
7. M9 Pistol Rails
8. Future Handgun
9. Small Arms Suppressors
10. M68 Close Combat Optics (Dual Source Qualification)
11. 12 Gauge Non-Lethal Extended Range Round
12. M107 Sniper Ammunition
13. XM110 - 7.62 Semi-Automatic Sniper System (SASS)
14. Close Quarters Battle Kit
15. XM1041/XM1042 - Close Combat Mission Capability Kit
16. XM102 - Reloadable Stun Practice Hand Grenade (RSPHG)
17. XM320 - Grenade Launcher Module (GLM)

### **BLOCK MOD PROGRAMS**

18. CROWS-Light Remote Weapons Station
19. Advanced Combat Optical Gunsight
20. Enhanced 50 Cal
21. Platform Integrated Swing Arm Mount
22. Medium Machine Gun Weight Reduction Program
23. M240H, 7.62mm MG High Capacity Feed System
24. M249 SAW 200 Round Soft Pack

### **AMMO BLOCK MOD PROGRAMS**

25. XM1037, Short Range Training Round For M249
26. XM1060 40mm Multipurpose Cartridge
27. Lightweight Small Caliber Ammunition
28. Air Burst Ammunition

## RFI FY05 ITEMS

- |   |                               |
|---|-------------------------------|
| 29. TA31F - 4X ACOG                     | ▪ Back Up Iron Sight          |
| 30. Weapon Light                        | ▪ M249 Rail                   |
| 31. M24 Small Binoculars                | ▪ M240B Rail                  |
| 32. M122/A1 Tripods                     | ▪ M249 Ammo Soft Pack         |
| 33. M249/M240B Spare Barrel Bag         | ▪ M240B Combat Ammo Pack      |
| 34. Three Point Sling                   | ▪ M192 Lightweight Tripod     |
| 35. Improved Spotting Scope With Tripod | ▪ M249 Short Barrel           |
| 36. Improved Cleaning Kit               | ▪ M249 Collapsible Buttstock  |
| 37. Improved Buttstock For M4 Carbine   | ▪ M4/M5 Modular Weapon System |
| 38. Forward Grip Bipod                  | ▪ M145 Machinegun Optic       |
| 39. M203 Day/Night Sight                | ▪ M68 Close Combat Optic      |

## PROCUREMENT

40. MK19
41. Mod Kit
42. Lightweight Adjustable Sight Bracket
43. Tactical Engagement Simulator (TES)
44. M107 Semi Automatic Long Range Sniper Rifle
45. M107 Suppressor
46. M240B, 7.62mm Medium MG
47. M240H, 7.62mm Medium MG (Aviation Version)
48. M192, Light Weight Ground Mount For MG
49. Improved Bipod
50. Improved Flash Suppressor
51. Combat Ammunition Pack
52. M249, 5.56mm Squad Automatic Weapon
53. M249 Short Barrels
54. MG Front Rails
55. Improved Bipod
56. Collapsible Buttstock
57. M192, Lightweight Ground Mount For MG
58. Sling Assembly For M249
59. M16A4 5.56mm Rifle
60. M5 Adapter Rail
61. M4, 5.56mm Carbine
62. M4 Adapter Rails
63. Advanced Combat Optical Gunsight
64. Back Up Iron Sight
65. M68 Close Combat Optic
66. M203A1 MWO Kit
67. M203 Rail System
68. Sniper Accessory Kit
69. M145 Machine Gun Optics
70. M25 Stabilized Binoculars

## AMMO PRODUCTION PROGRAMS\*

- M995, 5.56mm Armor Piercing
- M993, 7.62mm Armor Piercing
- M903/M962 Cal .50 SLAP/SLAPT
- M1012/M1013, 12 Gauge Non-Lethal Point & Crowd Control
- M1006, Non-Lethal 40mm Round
- M1001, 40mm Canister Round
- M1029, 40mm Crowd Dispersal Cartridge
- M100, Grenade Rifle Entry Munition (GREM)
- MK243 MOD 0 9mm Jacketed Hollow-Point
- M862 5.56mm Short Range Training Ammunition
- M1030 12 Gauge Breaching Round
- MK281 Target Practice Cartridge

\* Programs Managed By PM Soldier Weapons  
For PEO Ammunition In Accordance With MOA

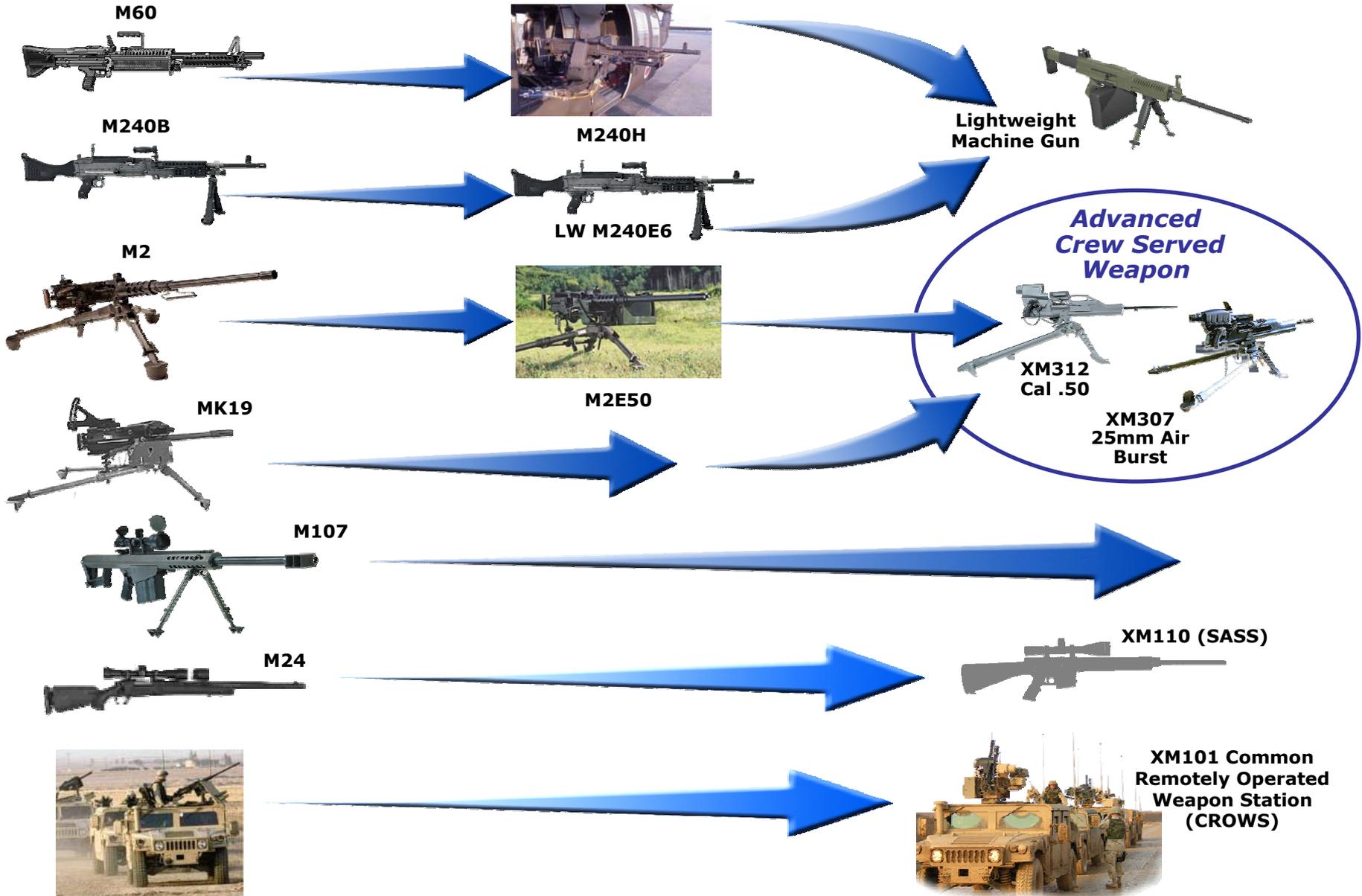


# Crew Served Weapons





# Crew Served Small Arms Path To The Future

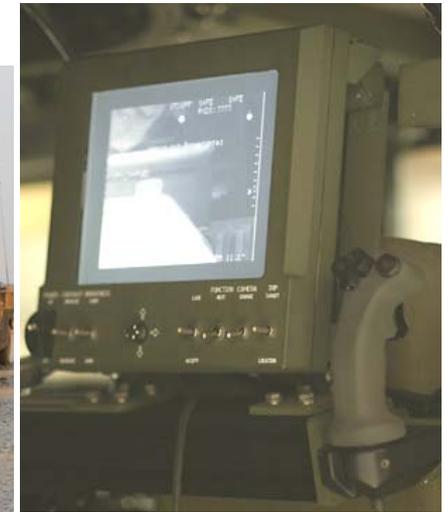




# Common Remotely Operated Weapon Station (CROWS)



- Provide Soldiers With Capability to Acquire and Engage Targets at Maximum Effective Range While Protected by Vehicle Armor
- Supported Weapons
  - MK19 GMG, Cal .50 M2 MG, M249 SAW, M240B MG
  - Growth to M230 & XM307
  - Weapons Can be Quickly Interchanged by Soldier
- Sensor Suite Supports Day/Night Engagements
- Can Zoom Optics on Target Independent of Gun Super Elevation
- Two-Axis Stabilized Mount, Laser Rangefinder & Fire Control Software Support On-The-Move Target Acquisition & First Burst Target Engagements



**Provides Extended Range Surveillance And Detection Of IED Emplacements**



# CROWS Description (Cont.)



- **Maximum Weight (M2 Configuration)**
  - Above Roofline Weight 395 lbs
  - Plus Weapon, Ammo, Pintle, & Ballistic Protection
- **CROWS Ballistic Protection**
  - Weight 114 lbs
  - 7.62mm AP
- **CROWS Pedestal Design**
  - Allows Simple Attachment
- **Environmentally Hardened**
- **Video Gun Fire Stabilization**
- **Sector Scan & Target Reference Points S/W**
- **Lead Compensation**
- **Folds To 18"**





# CROWS System Capabilities



- Ammo Ready Round Capacity:
  - MK19: 96 Rounds
  - M2: 500 Rounds
  - M249: 1400 Rounds
  - M240B: 800 Rounds
- Traverse: Continuous 360°
- Range Of Elevation: +60° to -20°
- Traverse Rate (Proportional to Field of View): 80°/s (max)
- Elevation Rate (Proportional to Field of View): 60°/s (max)
- Two Interchangeable Cradles:
  - Heavy Cradle: MK19/M2
  - Light Cradle: M240/M249
- Height To Top Of Weapon: <28 " ; <18" Folded
- Total System Weight (Less Weapon, Ammo, Ballistic Protection, Integration Kit): 430 lbs
- Safety Features:
  - Programmable Stops in Traverse
  - Manual/Emergency Back-Up Operation of Weapons Through Top Hatch
- Sensor Suite Supports Day/Night Conditions to Maximum Effective Weapons Range:
  - Elevates Independent of Weapon
  - Continuous Optical Zoom Day (1.2° To 26° Field of View)
  - 4 Fields Of View 2<sup>nd</sup> Gen FLIR w/ 3° & 9° Optical Field of View w/Digital Zoom
  - 5 Km Laser Rangefinder

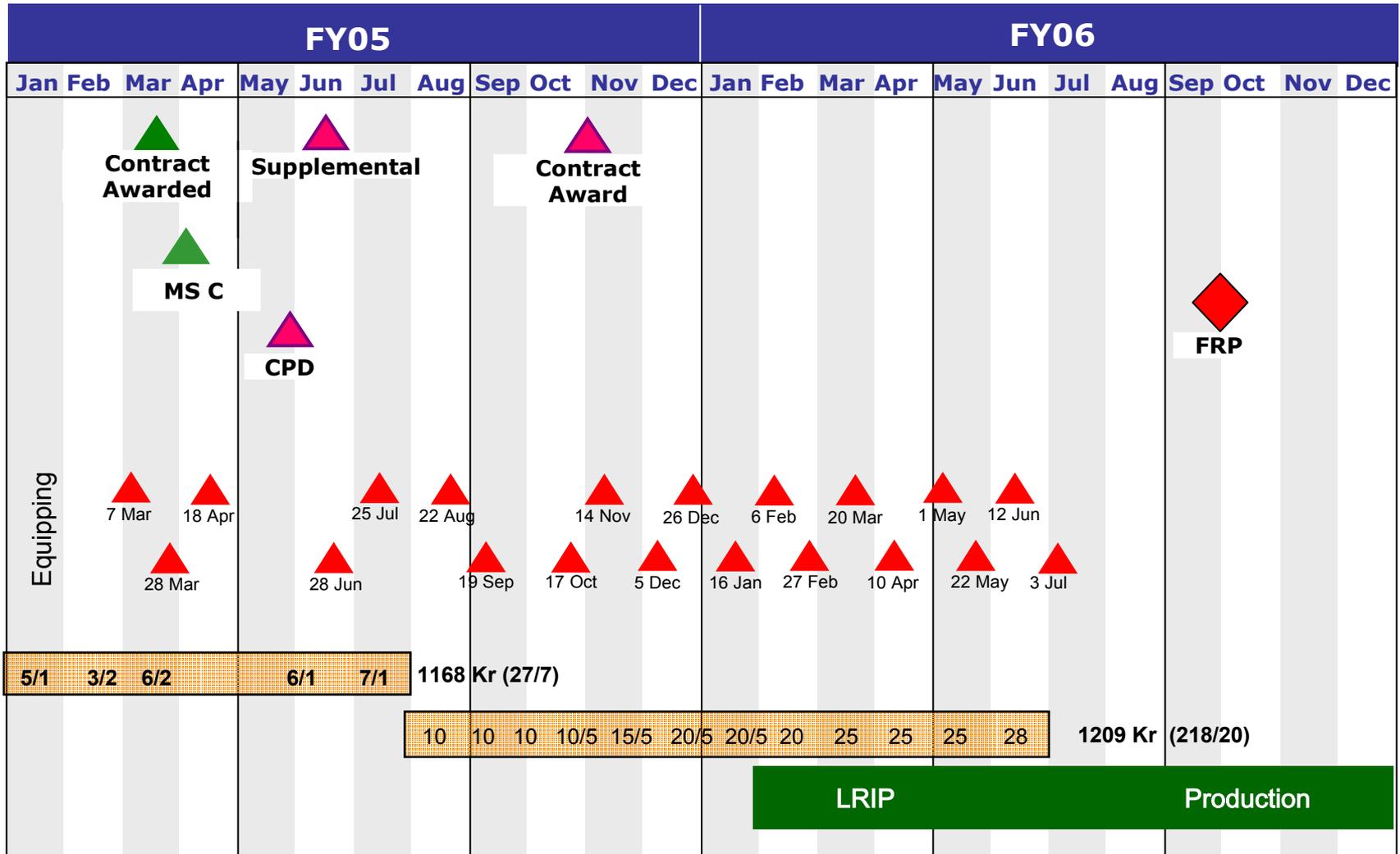


# CROWS Operations Video





# Program Schedule





# CROWS Operator Graduates In OIF





# CROWS - Lightning



## PM Soldier Weapons & Rapid Equipping Force Initiative



# CROWS-Lightning Objectives



- Deploy Three Lightweight Remote Weapon Stations To OIF For Operational Assessment And Requirement Development.
- Execute Follow-On Program To Type Classify & Field Lightweight Remote Weapon Stations Capable Of Mounting Current Weapons (M240 & M249) With Growth To Advanced Crew Served Weapon (XM307).



# CROWS-Lightning System Capabilities



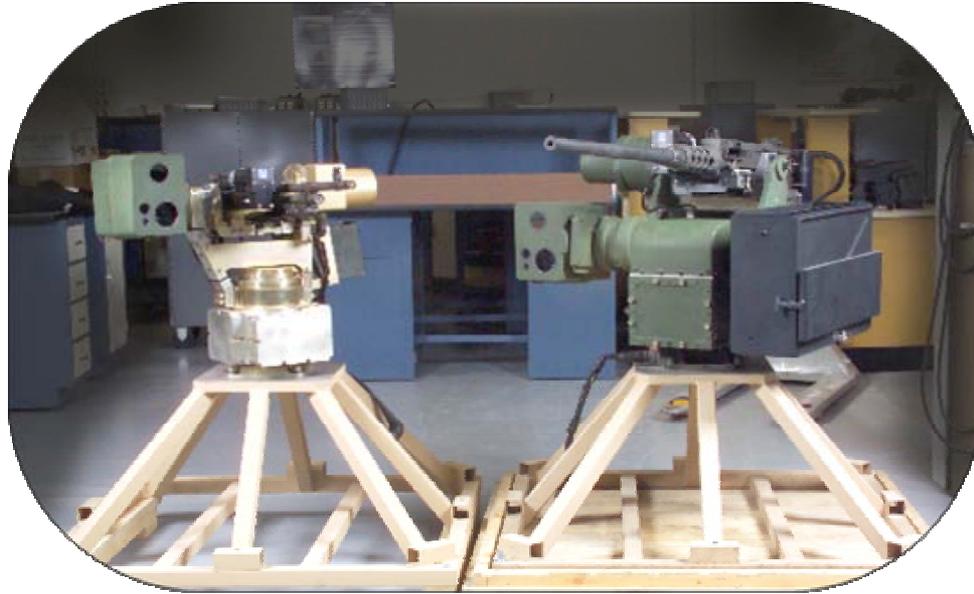
- Lightweight Application for Various Wheeled & Tracked Vehicles (From HMMWVs & Heavy Trucks To Armored Personnel Carriers)
  - 200 lbs Above Roof Including Weapon & Ammo (200 rds)
- Moves Unprotected Gunners Into Vehicle Interiors
- Day/Night Capability to Identify & Defeat Targets Out To Max Effective Range of Weapons While On-the-Move
- M240 Or M249 Machine Guns w/Growth To Advanced Crew Served Weapon (XM307)



- Powered by Current Vehicle Capability
- 2-Axis Stabilization
- Traverse: 360° Continuous
- Range of Elevation: -15° to +45° (Objective: -20° to +60°)
- Slew Rate: >30°/sec
- Safety Features:
  - Programmable Stops In Traverse
  - Manual/Emergency Back-Up Operation Of Weapons Through Top Hatch



# Commonality w/CROWS



- Same Mounting Interface
- Major Components: Slip Rings, Fiber Optic Gyros, User Interface, Cables, Vehicle Adapter Kit, Operator & Maintainer Training, Remote Chargers
- Can Share Sensors
- Leverages Existing Field Support & Spares

**75% Commonality w/CROWS**



# Semi-Automatic Sniper System (SASS)



## Objective:

To Acquire, Qualify & Field a Commercial & Non-Developmental Item (CaNDI) Semi-Automatic 7.62 x 51mm Caliber Weapon System To Address M24 Sniper Weapon System (SWS) Deficiencies

## Description/Characteristics:

- Effective Against Personnel Targets & Possible Light Materiel Targets
- Supplements Sniper's Role To Support Combat Operations
- Greater Firepower & Standoff Ranges To Improve Sniper Survivability
- Rapid Fire/Rapid Reload, Suppressed Sniper Rifle
- Exceeds Rate-of-Fire & Lethality of M24 Sniper Weapon System (SWS)
- Primarily Anti-Personnel Ranges Equal to or Greater Than M24
- Includes Enhanced Sniper Spotting Scope
- Life Cycle Contractor Logistic Support



## Components

- Semi-Automatic 7.62mm Rifle
- Integrated MIL-STD-1913 Rail
- Back Up Iron Sights
- Collapsible Bipod
- Weapon Ammunition Magazines
  - Four (4) Twenty-Round Magazines
  - Two (2) Ten-Round Magazines
  - Two (2) Five-Round Magazines)
- Sling
- Day Optic Scope
- Operator & Maintenance Manuals
- Muzzle Flash Hider (When Suppressor Not Used)
- Hard Carrying Cases (For Rifle & Day Optic Scope)
- Soft Carrying Case (For Rifle & Day Optic Scope)
- Deployment Kit
- Cleaning Kit
- Blank Firing Adapter (If Available)
- Suppressor (Combination Acoustic, Flash, & Blast)



# M240 Variants



## ***M240B 7.62mm Machine Gun***

**Description:** A 7.62mm M240 Series Machine Gun Configured For Ground And Vehicle Mounted Application With Buttstock, Bipod, Iron Sights And Full Trigger Assembly

### **Capabilities:**

- Delivers A High Volume Of Accurate Fire
- Demonstrates 83,000 Mean Rounds Between Operational Mission Failures (15,000 Req'd)
- Demonstrates 41,667 Mean Rounds Between Stoppages (1,800 Req'd)



## ***M240E6 7.62mm Machine Gun (Light Weight)***

**Description:** A Light Weight M240B 7.62mm Machine Gun Utilizing High Performance, Lightweight Materials And Alternate Manufacturing Methods To Reduce The Weapon Weight By 4-7 lbs Without Compromising Reliability

### **Capabilities:**

- Deliver The Same Operational Performance Characteristics As The M240B
- Reduce The Soldier's Combat Load By 4-7 lbs
- Allow Easier Handling And Movement When Employing The Weapon





# M240H Aviation Machine Gun





# M240H Aviation Machine Gun



## System Description

7.62mm Aviation Machine Gun which improves the Self Protection capabilities of the UH-60 and CH-47 Helicopters.

Replaces the aging and unreliable M60D Machine Gun.

## Capabilities

- Demonstrate Reliability Equal To The M240B
- Deliver 2 Minutes Of Suppressive Fire
- Removable/Employable In A Ground Role



- Type Classification: 13 August 2004
- Full Material Release: 25 April 2005
- First Unit Equipped: 29 April 2005
- Production: FY04-07, 3914 units
- Contractor: FN Manufacturing LLC  
Columbia, SC

Initial Operational  
Capability  
5 May 2005,  
Operation Iraqi  
Freedom!



# M240H Aviation Machine Gun (continued)



## MAJOR SUBSYSTEM COMPONENTS

### ■ M240H Mount

- Solid Mount / Cradle
- Pintle with Associated stops and locking devices
- Link/case collection system
- Ammunition container and Mounting Bracket
- Ammunition Box Magazine

### ■ M240H 7.62mm Machine Gun

- Spade grip / Butterfly Trigger
- Charging Handle Return Spring
- Improved M240B Bipod
- Top Cover Rail
- Forward rail assemblies
- Extended Charging Handle
- Single Port Gas Plug
- Improved M240H Flash Suppressor
- Spare Barrel Assembly
- Carrying Case, Spare barrel
- Egress kit
  - M240B Buttstock with hydraulic buffer
  - M240B Trigger Assembly
  - M240B Sling Assembly





# M2 Heavy Barrel (M2HB) Machine Gun, Enhanced (E50)



## Objective:

Limit the Soldier's exposure time to enemy fire while changing the barrel and setting headspace and timing of the M2H2 machine gun.

## Capabilities of Enhanced M2HB:

- Fixed headspace (changing hot barrels requires adjusting headspace—doing it wrong can destroy weapon and injure user)
- Vortex flash hider to reduce signature
- Improved carrying handle
- Rails to mount optics
- Safety Switch



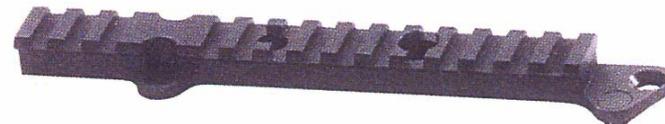
QCB



Safety



Flash Suppressor



Picatinny Rail Sight Mount



## **Advanced Crew Served Weapon (ACSW)**

***LTC Kevin Stoddard, PM***  
***Brian Kenney, PM***

***PM Crew Served Weapons***  
***GDATP***



# ACSW Program Overview



- Currently in SDD with PEO Soldier
- Developing a remotely operated variant (ROV) for FCS manned and unmanned vehicles
- Potential to accelerate 25mm crew served variant and ammunition for Stryker Brigades and ground force units
  - ICD approved by TRADOC
- Potential to accelerate type classification of .50 caliber variant



# ACSW Weapon System



- Lightweight and flexible design to defeat variable threats
- Low recoil results in lightweight design and stable system for enhanced accuracy & dispersion
- Low system weight reduces vehicle mount size and allows for easy dismount and portability
- Full solution fire control provides first burst lethal fires with 25mm airburst and armor piercing effectiveness to 2000m
- Modular design allows quick operator level conversion from 25mm to .50 cal with four parts and no special tools
- XM312 provides mission versatility and a low cost, live fire training device



# XM307 Vehicle Integration Common Weapon, Common Solution



## ■ FCS Manned Ground Vehicles

C2V  
Primary Armament



FRMV  
Primary Armament



RSV  
Primary Armament



NLOS-C  
Secondary Armament



MCS  
Secondary Armament



NLOS-M  
Secondary Armament



## ■ FCS Unmanned Ground Vehicles

ARV-A(L)  
Primary Armament



ARV-RSTA  
Primary Armament



***The XM307 has been selected as the Common Close Support Weapon for the Future Combat System Program***



# Portability



System	40mm Mk-19 ModB	Cal .50 M2HB	7.62mm M240	25mm XM307
Weapon Weight (lb)	75.6	84.0	24.2	<b>28.0</b>
Tripod Weight (lb)	65.4	46.1	19.2	<b>13.0</b>
Fire Control (lb)	N/A	N/A	N/A	<b>6.5</b>
Unloaded System Weight (lb)	141.0	130.1	43.4	<b>47.5</b>
Peak Recoil (lbs)	800	1000	80	<b>250</b>
Relative Lethality (lbs Ammo / Kill)	37	39	8	<b>1</b>
Max Effective Range (m)	1500	1830	1200	<b>2000</b>

- Low recoil burden on Remote Weapon Station
- Quickly dismountable from platform
  - Portable over rough terrain
- Light & compact
  - 80-90 lb weight savings for most platforms

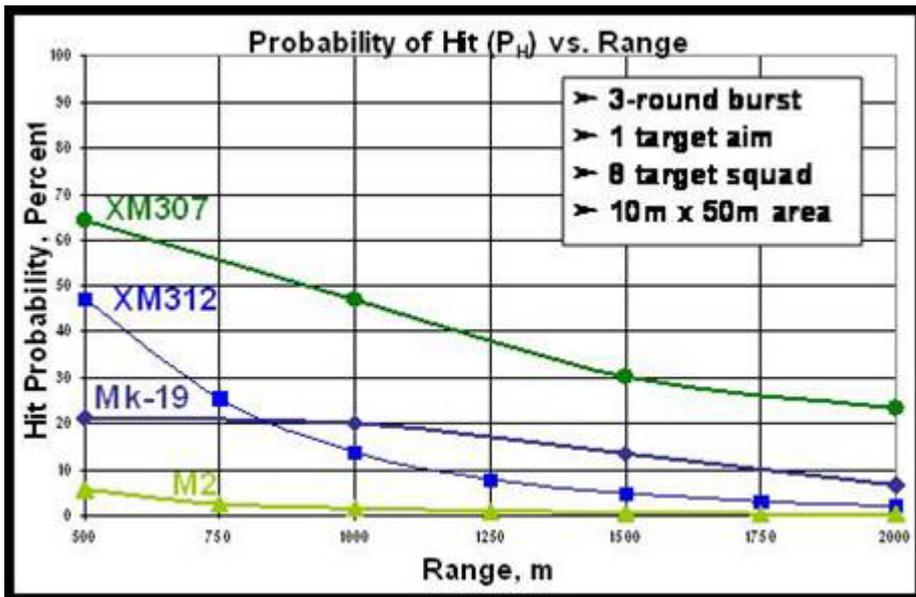
**Enhances Close Combat Employment Flexibility**



# Enhanced Lethality



- **25mm HEAB Round** 
  - Fuze accurate to +/- 3 meters at ranges up to 2000 meters
  - **Front and rear warheads** increase fragmentation pattern for greater lethality
- **25mm AP Round** 
  - Defeats light armor (2" RHA)
  - Shape charge - armor effects are not velocity/range dependent
- **Standard .50 Cal** 
  - .50 Cal Ball, .50 Cal API
  - Sniper rifle accuracy and time of flight against point targets



***Improved Accuracy and HEAB Fragmentation = Enhanced Lethality***



# ACSW Target Acquisition/ Fire Control



- **Full Solution Fire Control**
  - 5X Direct view optics with ballistically corrected aim point
  - Integrated laser rangefinder
  - Night operation with add-on thermal sensor
- **Extends the effective keep out range of the weapon**
- **Target detection of man targets out to 1000 meters with min 0.9 probability of recognition**
- **Display features support range cards and “no-fire” zones**

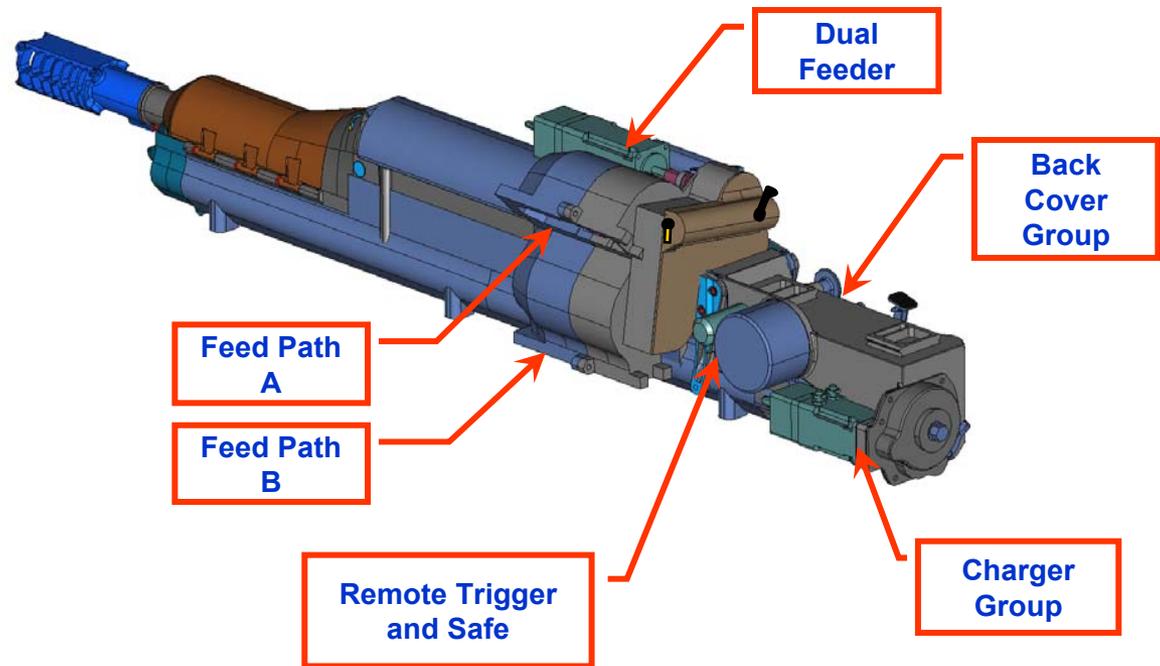
**- Rounds on target first shot, every shot**



# XM307 ROV - Remote, Lightweight, Compact Design



- Optimized design for mounted applications
- Integrated weapon, feed, sensors, and actuators
- Common interfaces for all FCS platforms
- Significant decrease to weight, volume, and integration effort
- Increased efficiency, reliability, and horizontal integration
- Self-powered dual feed
- HEAB capable either path
- First round selectable



(Preliminary views of in-process concept design)



# XM307 Weapon Integration Accomplishments



- CROWS Mount
  - Successful XM307 Integration, Operation, & Firing
- Stryker Remote Weapon Station
  - 4Q04
  - Kongsberg RWS
  - Successful XM307K50 Integration, Operation, & Firing
- TDP#1 First Shot 13 May



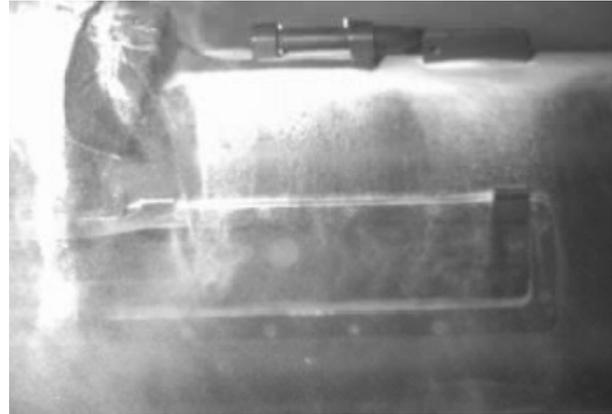


# Reliability Testing

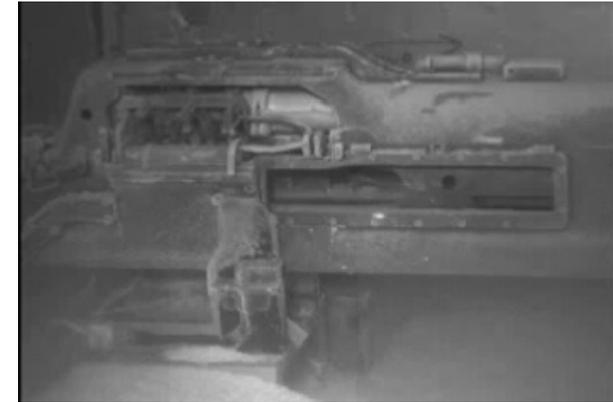


- 25mm & 0.50 caliber
- Environmental & performance testing

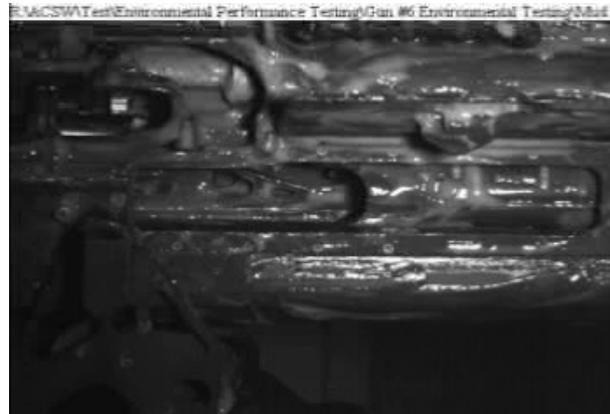
- Mud
- Rain
- Icing
- Attitude
- Vibration
- Sustained Fire
- Sand and Dust
- Unrestrained Bolt
- Low Temperature
- High Temperature



**Sand & Dust**



**-35°F Thermal**



**Mud**



**Sustained Fire**

- Reliability Testing
  - 30,000 rounds fired



# The Soldier "America's Most Deployed Weapon System"



**"Every Soldier  
Is A Rifleman First"**

**GEN Schoomaker**