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Responsive Accurate Mission Module

(RAMM)

**New Army STO
III.WP.2001.01**

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Report Documentation Page

Report Date 18JUN2001	Report Type N/A	Dates Covered (from... to) -
Title and Subtitle Responsive Accurate Mission Module New Army STO III.WP.2001.01		Contract Number
		Grant Number
		Program Element Number
Author(s)		Project Number
		Task Number
		Work Unit Number
Performing Organization Name(s) and Address(es) US Army ARDEC Artillery and Mortars Division		Performing Organization Report Number
Sponsoring/Monitoring Agency Name(s) and Address(es) NDIA (National Defense Industrial Association 2111 Wilson Blvd., Ste. 400 Arlington, VA 22201-3061		Sponsor/Monitor's Acronym(s)
		Sponsor/Monitor's Report Number(s)
Distribution/Availability Statement Approved for public release, distribution unlimited		
Supplementary Notes Proceedings from Armaments for the Army Transformation Conference, 18-20 June 2001 sponsored by NDIA		
Abstract		
Subject Terms		
Report Classification unclassified	Classification of this page unclassified	
Classification of Abstract unclassified	Limitation of Abstract UU	
Number of Pages 19		



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Responsive Accurate Mission Module (RAMM)

III.WP.2001.01

Definition

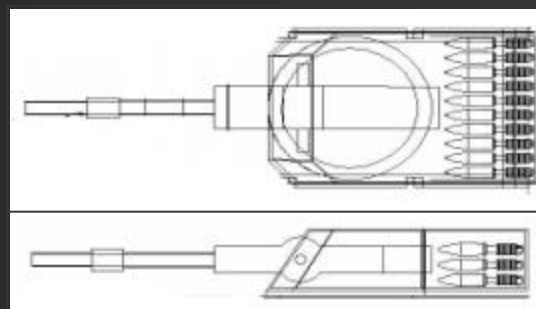
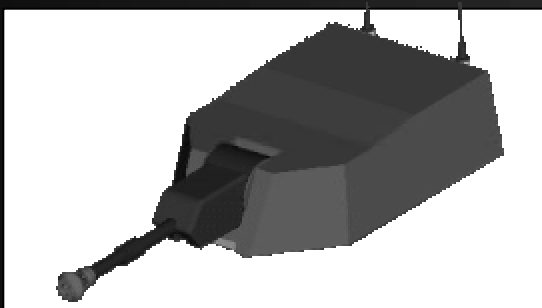


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R A M M

Responsive Accurate Mission Module

- A lightweight responsive mobile unmanned 120mm mortar module that will provide accurate remote (SENSOR-TO-SHOOTER) capability through a digital network to engage Red Zone Targets.*



RAMM

- In 1998 FSAC, ARDEC developed the first unmanned 120mm mortar technology demonstrator called Dragon Fire for the USMC CWL which successfully demonstrated the utility of a remotely controlled indirect fire system. RAMM is a next phase in this development.*

Lethality without Soldier Vulnerability



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Responsive Accurate Mission Module (RAMM) Initial Concept Demonstrator



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• Demonstrator Characteristics:

- Unmanned/remote controlled after emplacement
- Self-orienting/Self-positioning
- Able to receive digital call for fire and MET data
- Capable of internal ballistic computation for firing solutions
- Automatic gun pointing, ammunition loading and firing
- 360 degree traverse firing
- Transportable in V-22 aircraft

- *Dragon Fire was a single shot, towed, remotely controlled Warfighting Technology Demonstrator.*
- *RAMM will leverage Dragon Fire's proven technology with many additional capabilities and enhancements for FCS.*





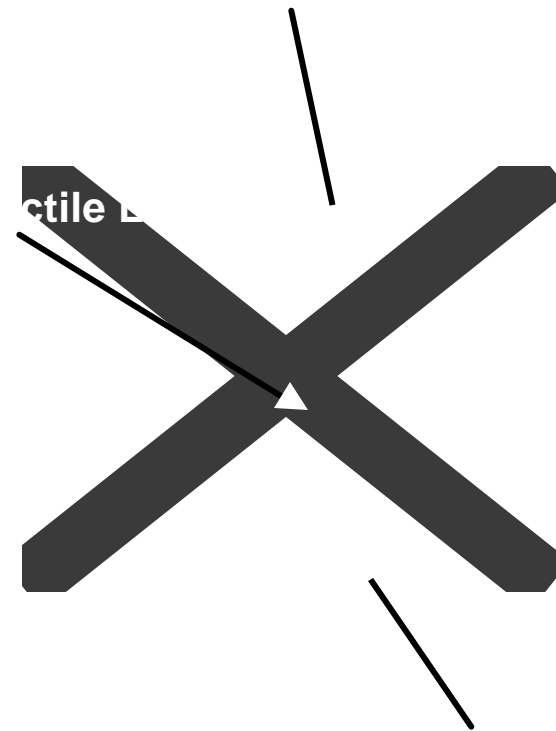
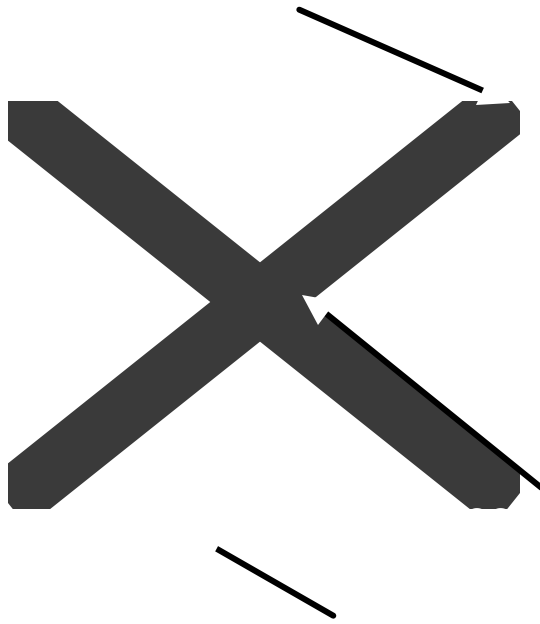


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RAMM Module Concept



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General Performance Objectives:

- **C130 Transportable**
- **Unmanned**
- **Module weight 4000-6000lbs**
- **Universal size and interface to fit on multiple FCS vehicle platforms**
- **Accurate automated gun pointing 0.5 – 1.0 mils, improved Nav and FO accuracies, MV compensation**
- **Responsive 11-15 sec round out from call for fire**

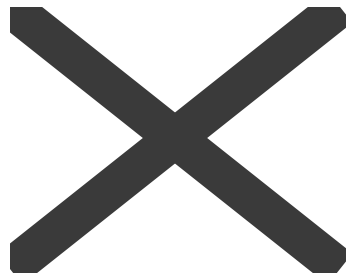


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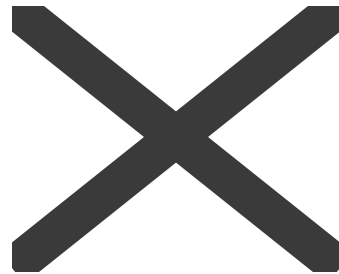
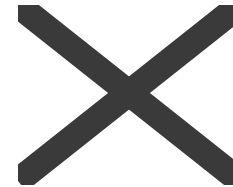
RAMM Module Concept on FCS and BCT Vehicles



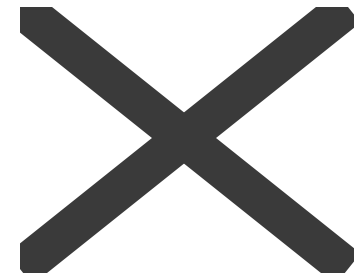
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**GENERIC FCS VEHICLE/RAMM
IN C130 AND RAILWAY
TUNNEL GAGE**



**RAMM MOUNTED ON
GENERIC FCS VEHICLE**



RAMM MOUNTED ON LAV III



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Responsive Accurate Mission Module

Why 120mm Mortar?



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Advantages of 120mm Mortar:

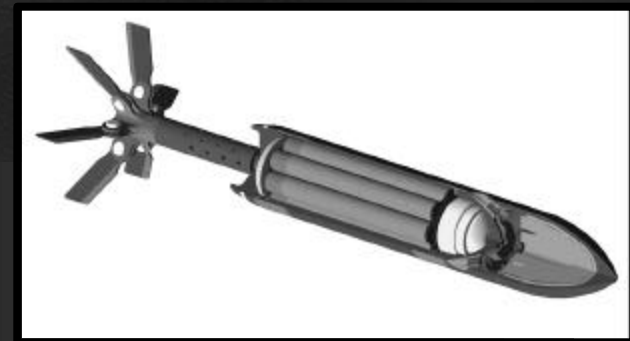
- *Interoperability* many NATO 120mm mortar varieties are available
- *Accuracy* PGMM for pin point accuracy, automated pointing will improve conventional round accuracy
- *Lethality* Size allows for many stowed kills, (120mm, 65-85% lethality of current 155mm Artillery)
- *Range* min-300 m (HE) 200m (Smoke/illumination), max-XM984 and PGMM will provide 15Km
- *Simplicity for Automation* Round contains all components needed for firing (propellant/primer/etc).
- *Relatively Lightweight* Armament envelope/weight/reaction loads are compatible w/ FCS size platforms
- *Economy* advanced rounds are approaching end of development cycle, low conventional round cost



PGMM



Conventional Rounds



XM984



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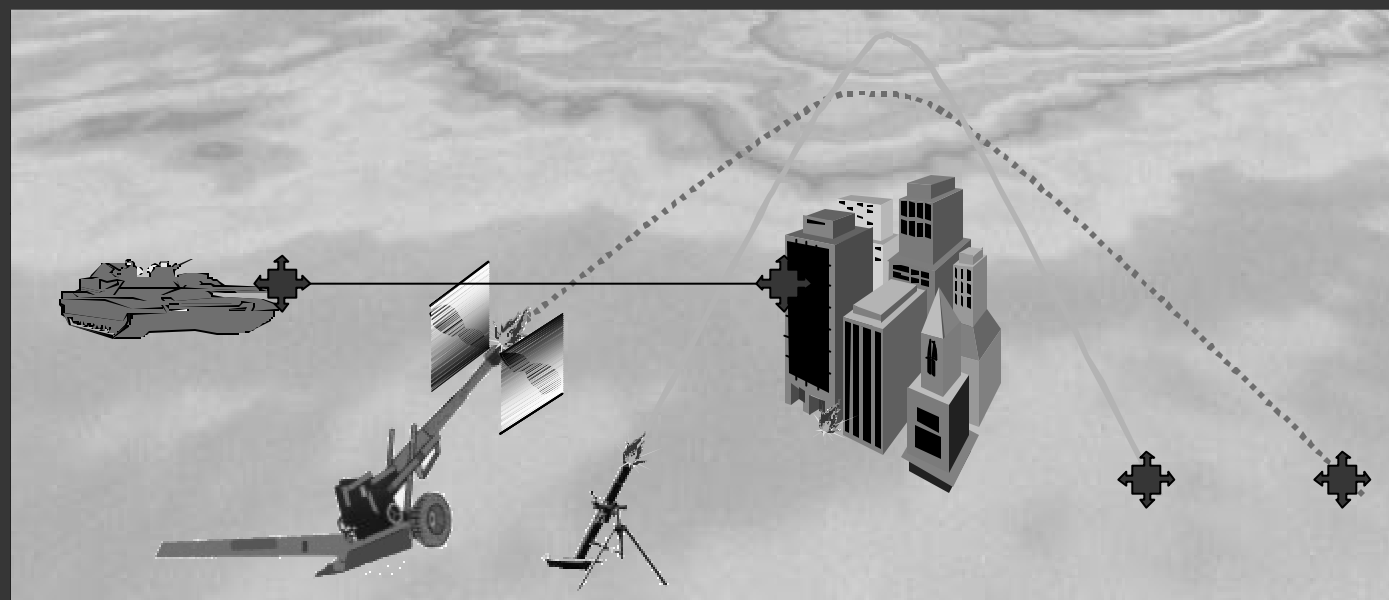
Responsive Accurate Mission Module (RAMM)

Basic Missions Concept



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RAMM is a hybrid indirect fire system that combines select capabilities of traditional mortars, artillery and direct fire systems.



- *Indirect Suppressive Fire*
- *Indirect Target Degradation*
- *Indirect Harassment Fire*
- *Indirect Soft target strikes*
- *Smoke Screen Fire for obscuration*
- *Battlefield/Target Illumination*
- *Very High/Low Angle Fire for MQUT*
- *Limited Direct Fire Capability*
- *Precision Strike against bunkers, wall breaching and stationary hard targets*



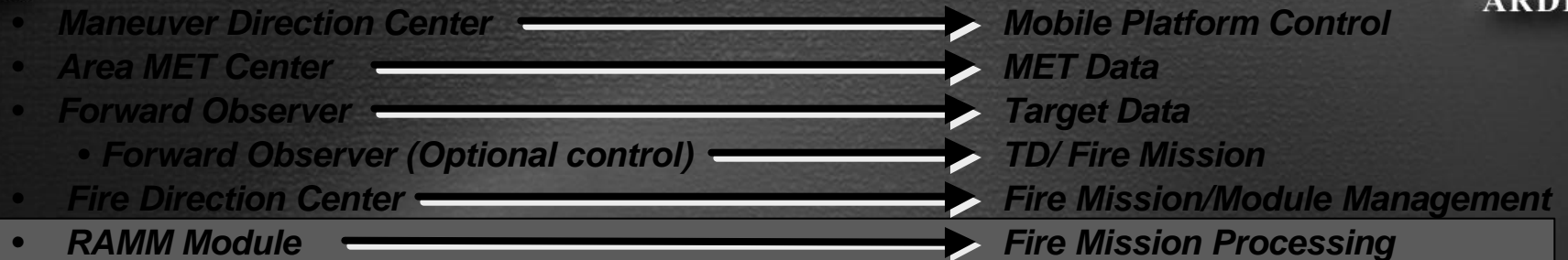
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Responsive Accurate Mission Module

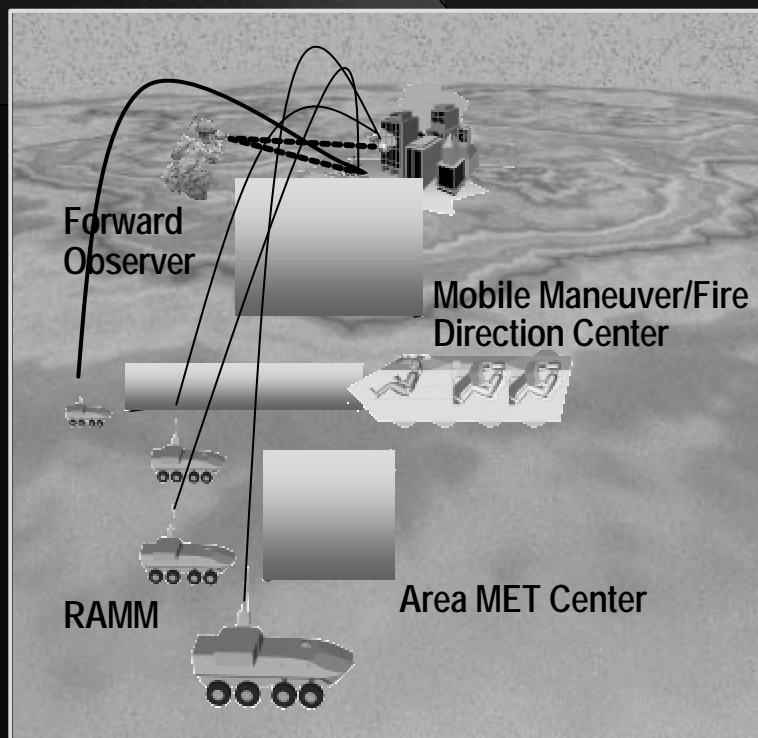
Basic Control Network Architecture



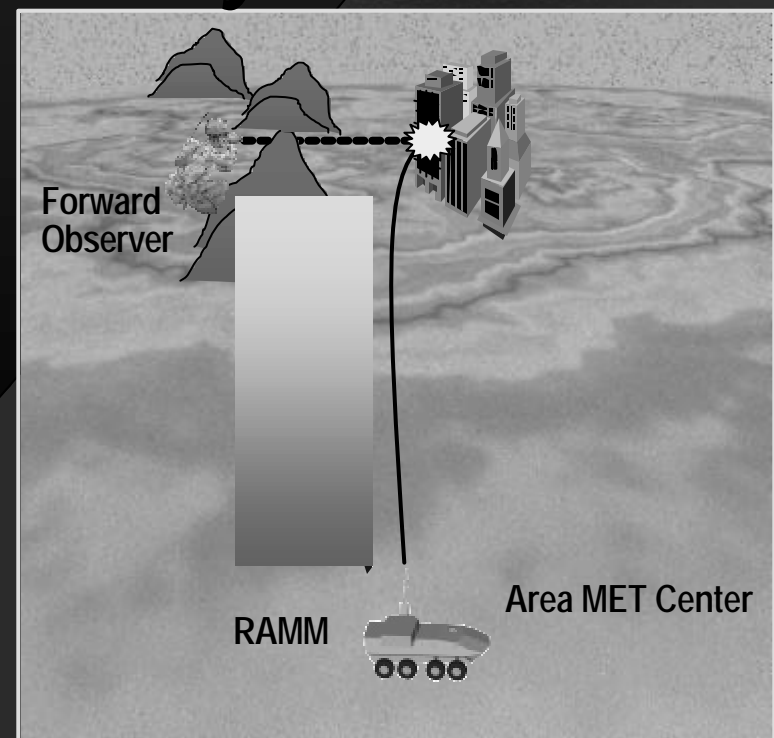
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RAMM is a System of Systems



• *Traditional Control Architecture*



• *Direct Control from FO (Aid in MOUT Combat)*



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Responsive Accurate Mission Module

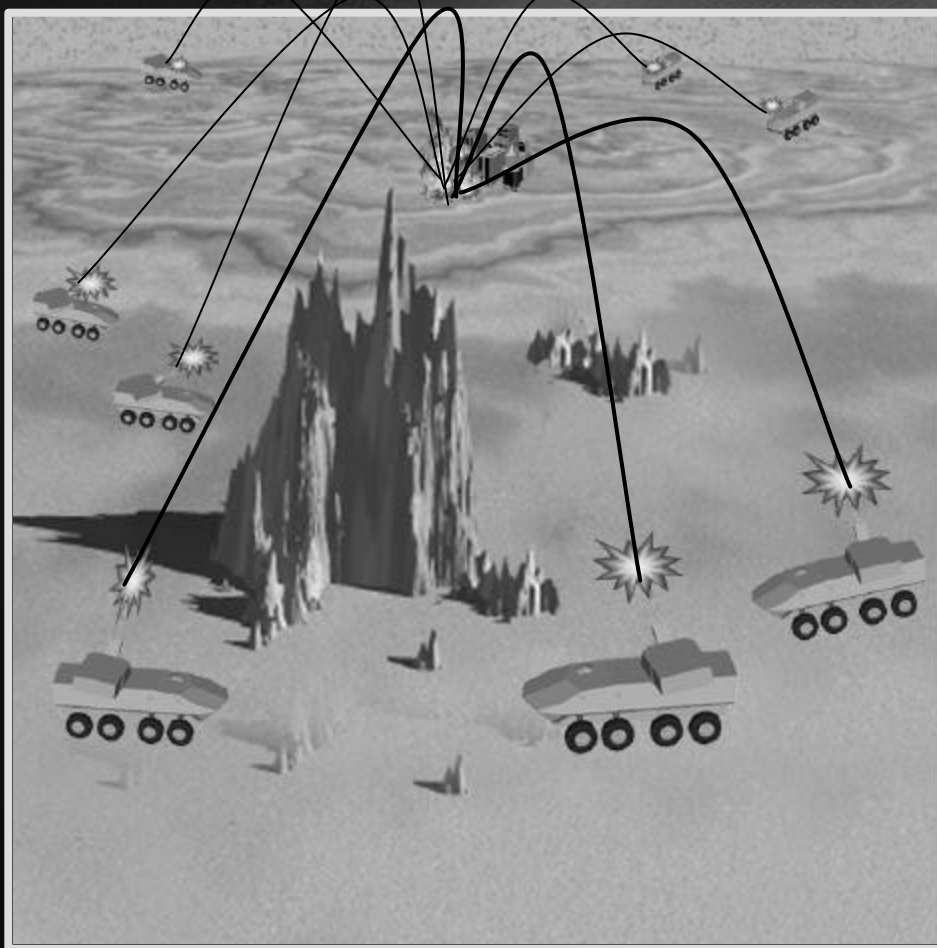
Basic Networked Operation



Widely dispersed RAMM systems can concentrate fire power on single or multiple targets to be used as a FORCE MULTIPLIER

Utilizing decision aids, the Future Warfighter will be able to:

- *Achieve high ROF for effects by closely cycling multiple RAMM units*
- *Confuse position location from counter battery fire through random fire from multiple locations*
- *Optimize individual RAMM magazine inventory by firing select rounds from select RAMM systems*
- *Digital networking will enhance tactics to compensate for systems damaged from battle*



RAMM is a System of Systems



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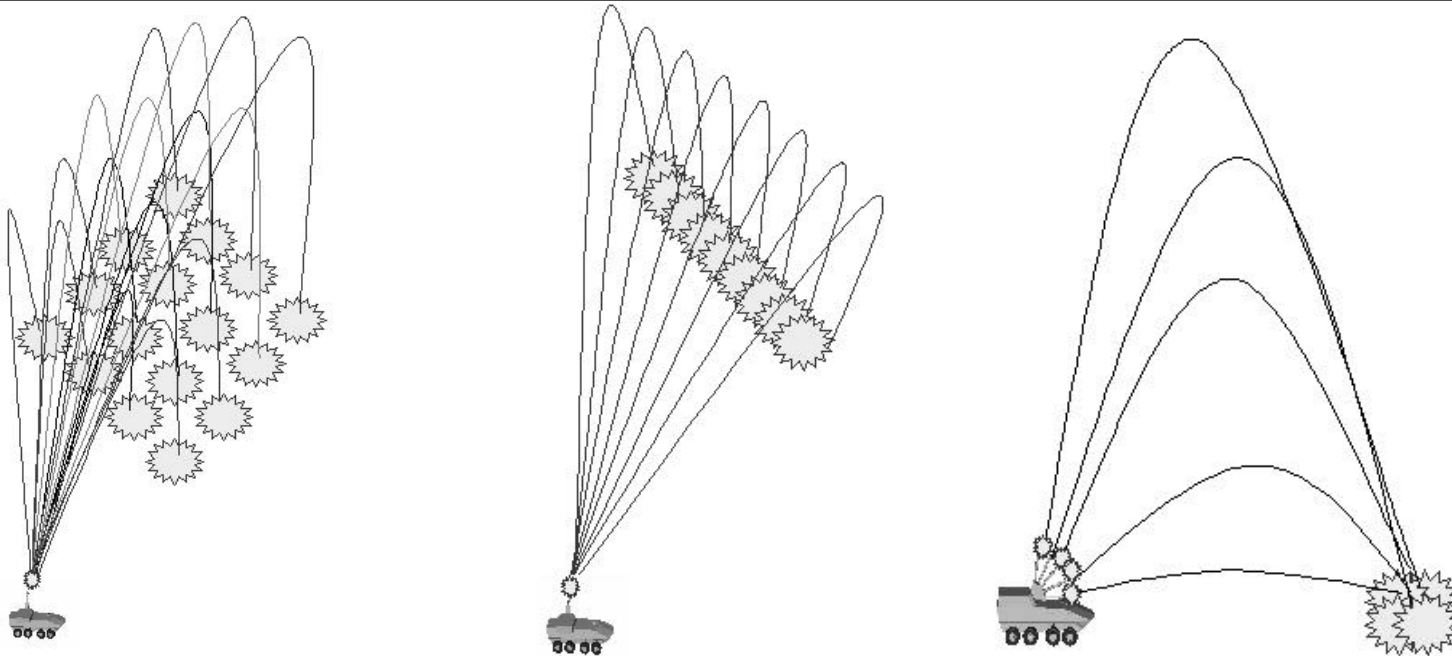
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RAMM is Evolutionary Near term planned capabilities

RAMM is a “building block system” where higher levels of intelligence/capabilities can be accomplished by means of software and tactical development



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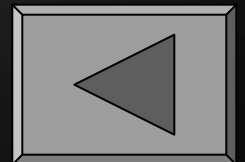
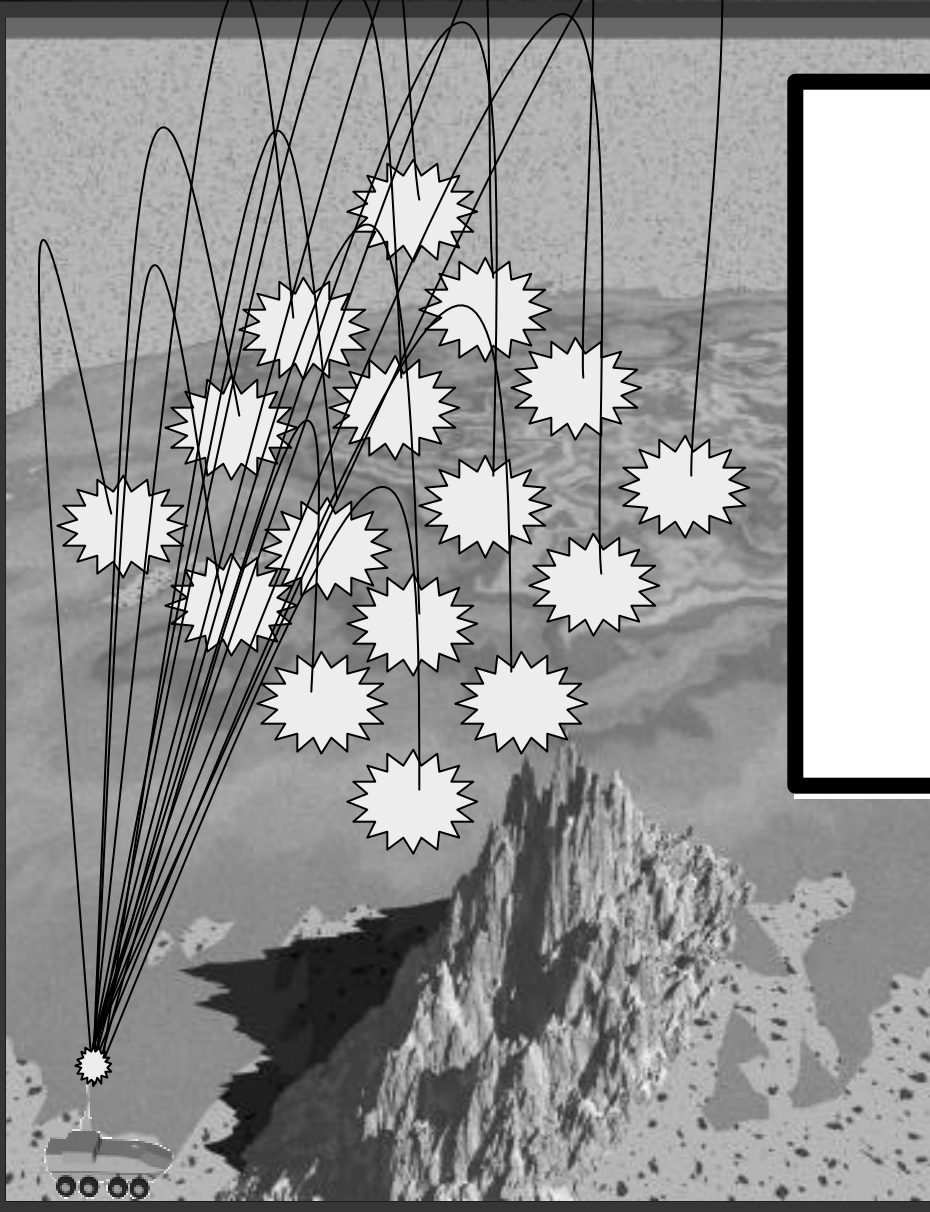
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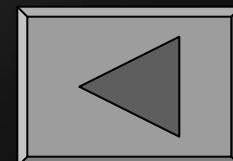
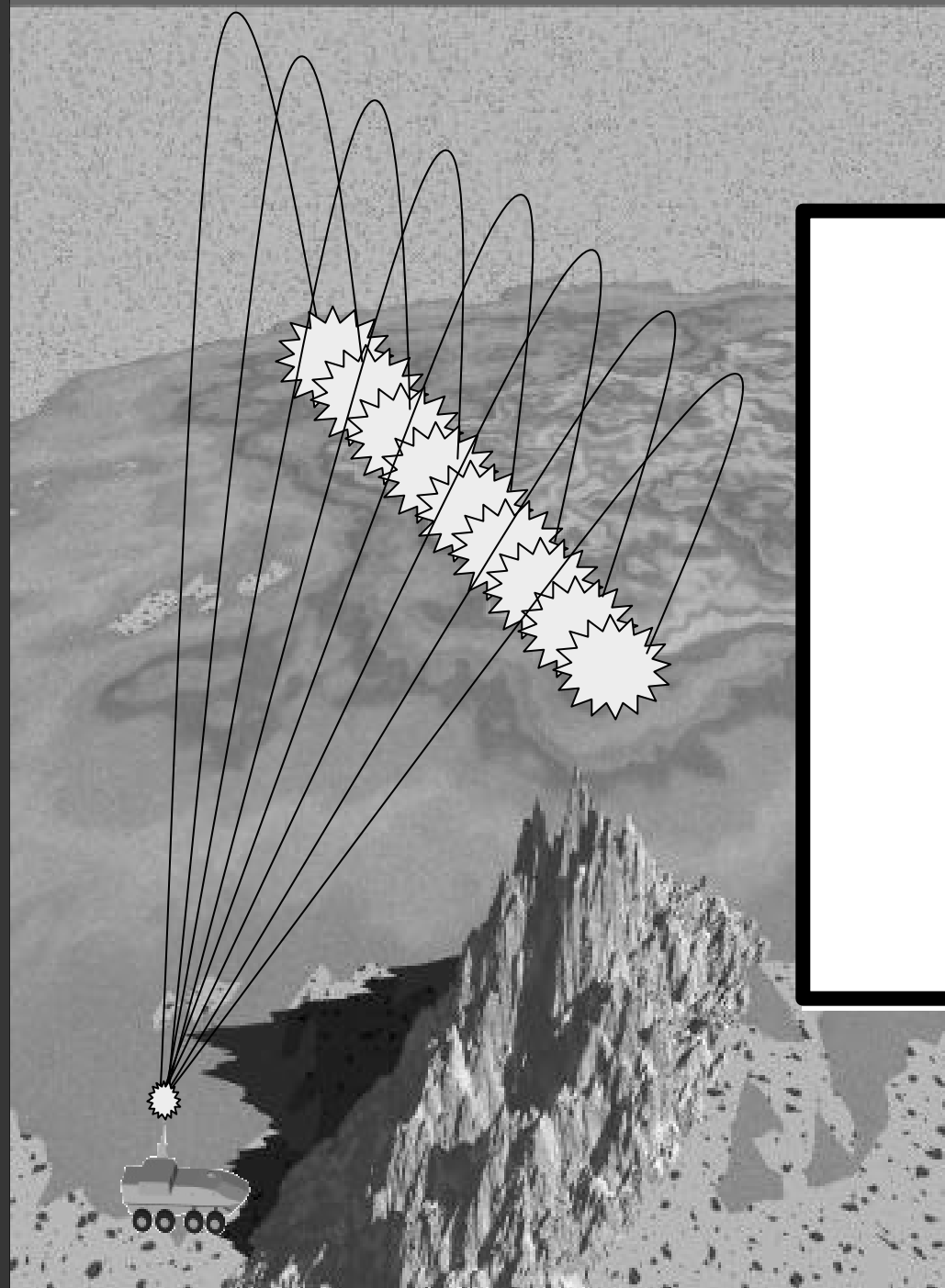
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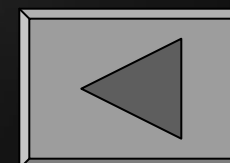
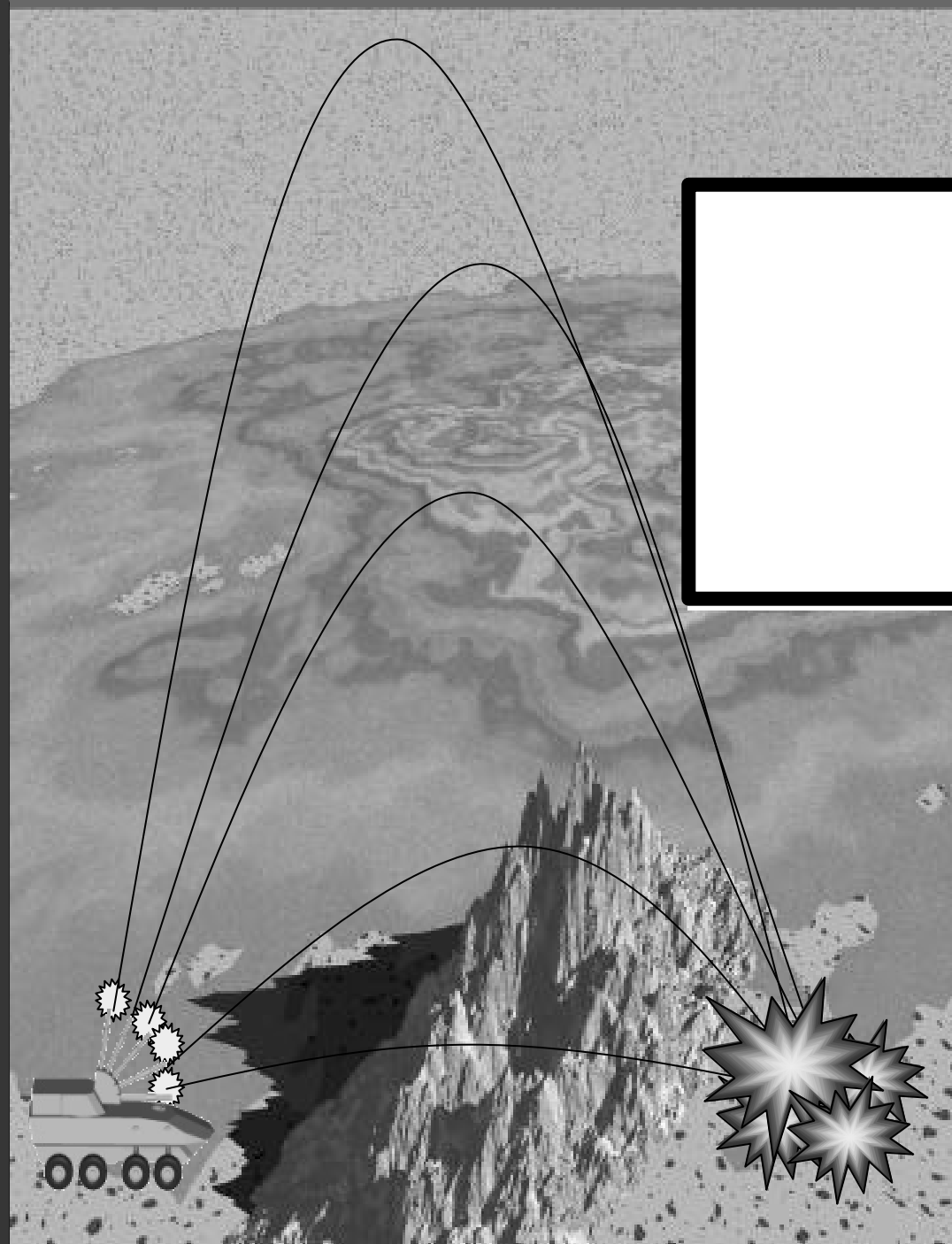
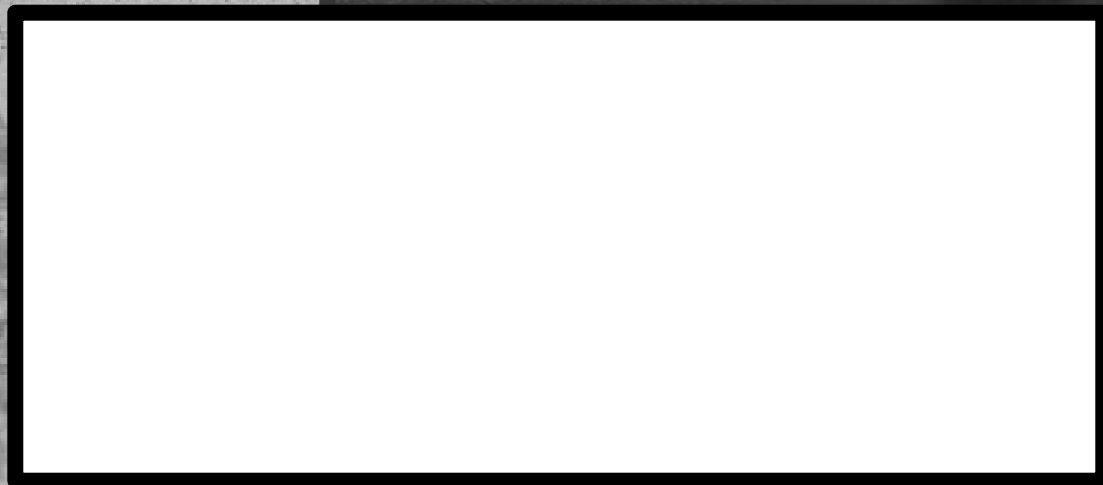
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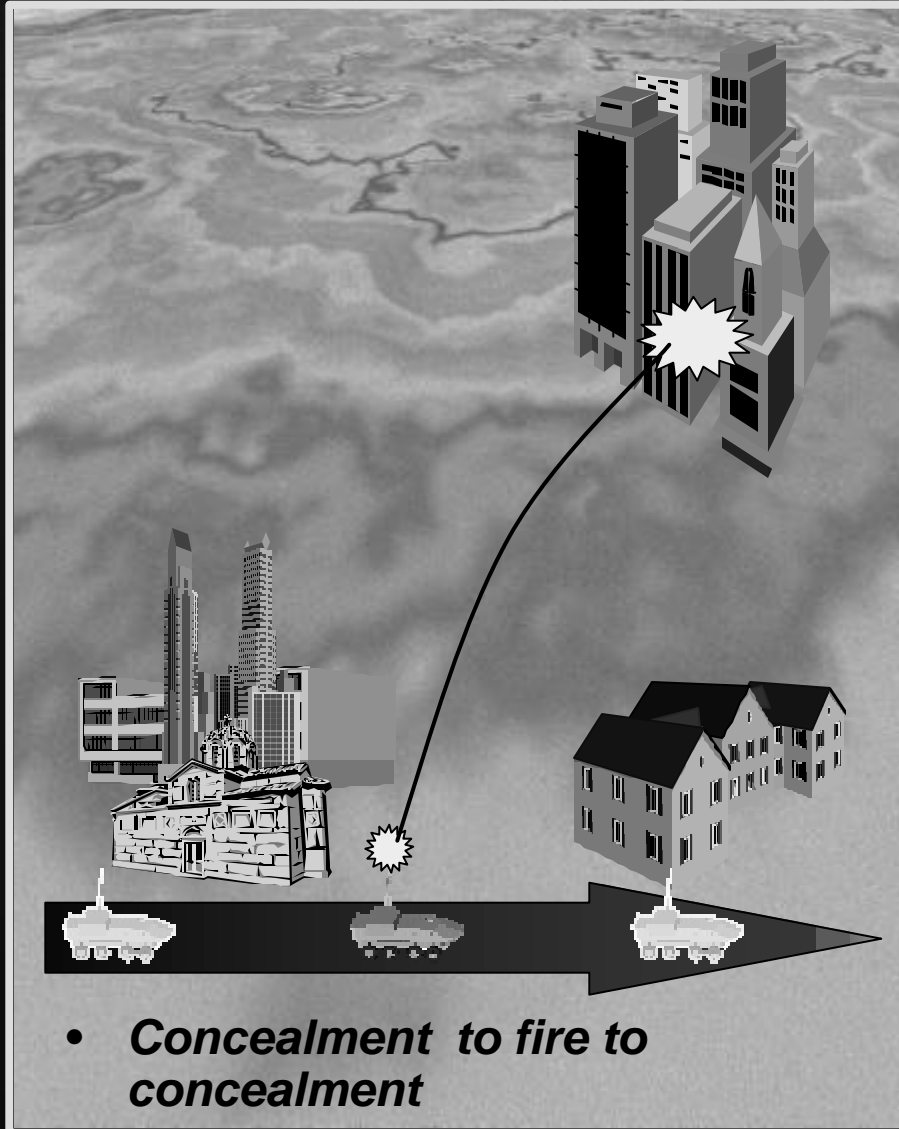


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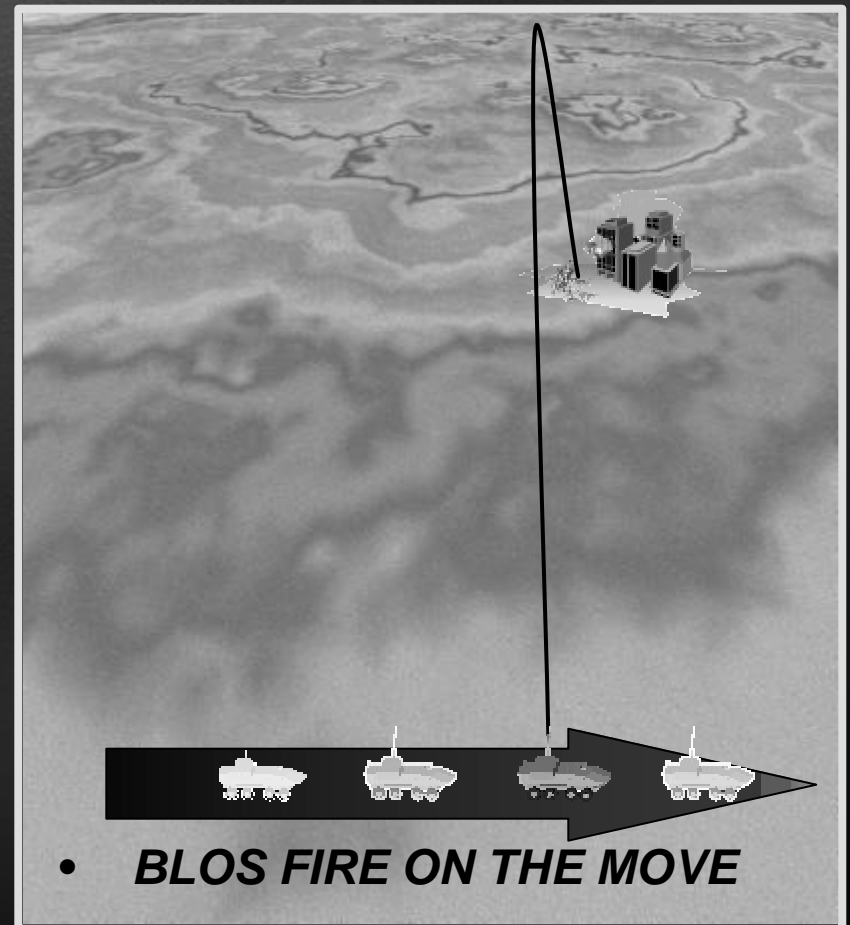
RAMM is Evolutionary continued

Obtainable Growth Potential



- ***Concealment to fire to concealment***

**Advanced Survivability Tactics
for FCS made possible through
software enhancements**



- ***BLOS FIRE ON THE MOVE***

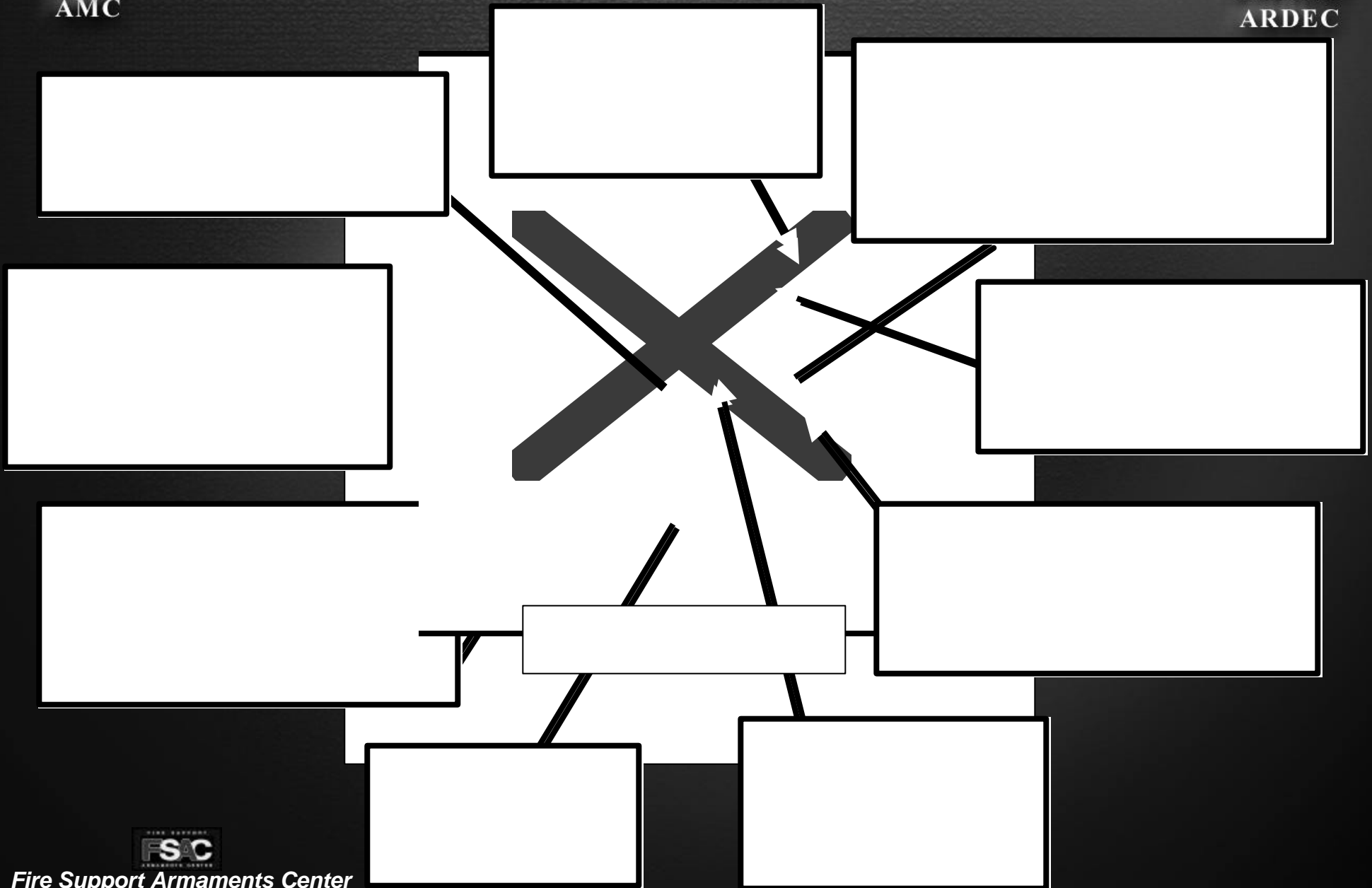


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Responsive Accurate Mission Module (RAMM) Technologies To Be Developed



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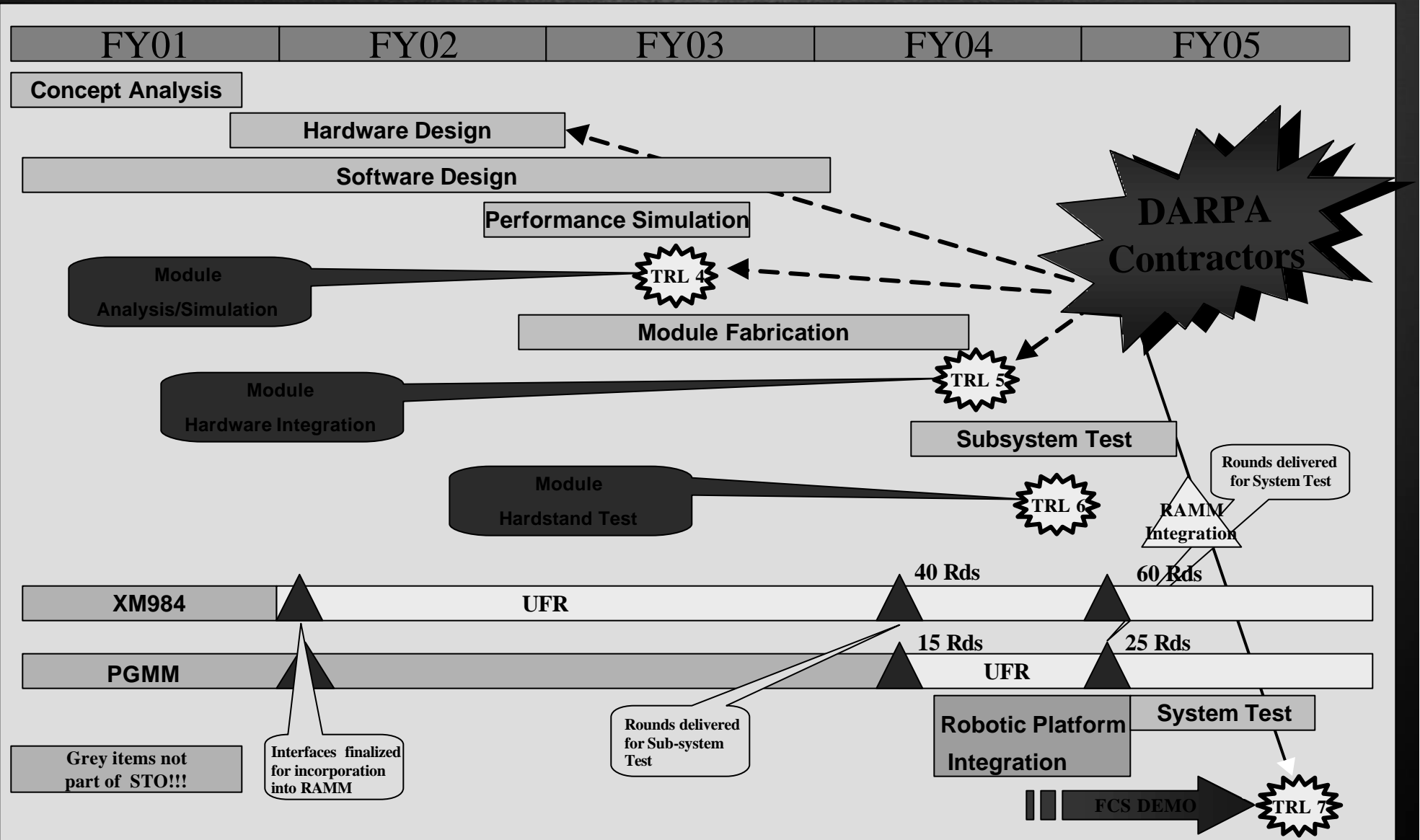
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Program Plan

Overall Project Schedule



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Summary

Value to Future Combat Systems



Modular- Integrate onto many FCS platforms (mobile unmanned/manned vehicle or towed trailer)

Survivable- Unmanned, the soldier can remotely conduct the mission safe from enemy fire.

Optimized Fire Effects- Accurate to benefit from pre-programmed impact effects, optimal stowed round usage for reduced logistics

Responsive- After call for fire round is in the air in seconds as opposed to minutes with current systems

Economical- Low round cost, Interoperable with many NATO rounds, Advanced projectiles development mature

Revolutionary- RAMM will introduce practical remotely operated weaponry to future warfighting



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RAMM Responsive Accurate Mission Module

An indirect fire system that can instantly respond and remotely conduct fire missions.

RAMM is a system of systems
and technologies:



Distributed Interactive Fire
Mission Technology



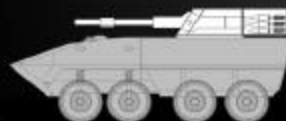
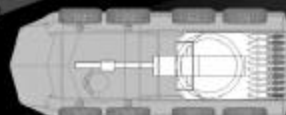
Robotic Vehicle
Technology



Dragon Fire



Future Guided
Munitions



RAMM

System Characteristics:

- 120mm Mortar
- Unmanned/remote controlled
- Self-orienting/Self-locating/Self-navigating
- Able to receive digital call for fire and local MET data
- Capable of internal ballistic computation for firing solutions
- Automatic gun pointing, ammunition loading and firing
- 360 degree azimuth firing
- Capable of direct and indirect fire
- 32 round magazine/loader
- First round hit accuracy out to 15 km
- Total vehicle system weight under 20 ton

Operational Benefits:

- Increased small unit lethality
- First round target effects
- BLOS, High target engagement rates
- Non-contiguous combat
- Rapid response, accurate, flexible fire support
- Highly mobile
- Reduced Soldier exposure/risks
- Increased maneuver OPEMPO
- Alternative to personnel mines when linked w/ sensors
- Approaching indirect fire on the move capability

Future Combat System

Forward Observer

- Soldier
- UAV
- Ground Sensor
- Aircraft

Enhanced Fire Direction Center
(man in the loop)

Area MET Center

RAMM/FCS

Further Questions Please Contact:

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RAMM will provide robotic warfighting technology
for the Future Combat System



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