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# Advanced Anti-Radiation Guided Missile: Strengthening DEAD Capability in the Fleet

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Austin Miller

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# The Capability to Destroy Enemy Air Defenses (DEAD)



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## AARGM Can...

- Defeat Integrated Air Defenses,
- By employing...
- Emitter Geo-location
  - Active Terminal Guidance
  - Network Integrated Communications,

## As proven in...

- Numerous Development Tests.



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- **Capabilities**
  - Counter Shutdown
  - High Speed Standoff Strike Weapon
  - Expanded Threat Coverage
  - Geo- Specificity - Reduced Fratricide & Collateral Damage
  - Net Ready Communications
- **Subsystems**
  - Anti-Radiation Homing
  - Millimeter Wave
  - Guidance, Navigation & Controls
  - Network Connectivity
- **Concept of Operations**
  - Target of Opportunity
  - Pre-Briefed Target
  - Point to Point Target
- **Testing**



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# AARGM Defeats Integrated Air Defense Systems



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## • New for AGM-88E

- **Counter Shutdown**
  - From SEAD to DEAD
- **High Speed Standoff Strike Weapon**
  - GPS guided point-to-point mode
- **Expanded Threat Coverage:**
  - Modern Air Defense Threats
  - Expanded Frequency Coverage
  - Non-Emitting Mobile Targets
- **Geo- Specificity - Reduced Fratricide & Collateral Damage**
  - GPS Defined Missile Impact and Exclusion zones
- **Net Ready Communications**
  - Off-board correlation via Integrated Broadcast Service receiver (IBS-R)
  - Weapon impact assessment via WIA Transmitter





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# Anti-Radiation Homing Subsystem



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## Key Features

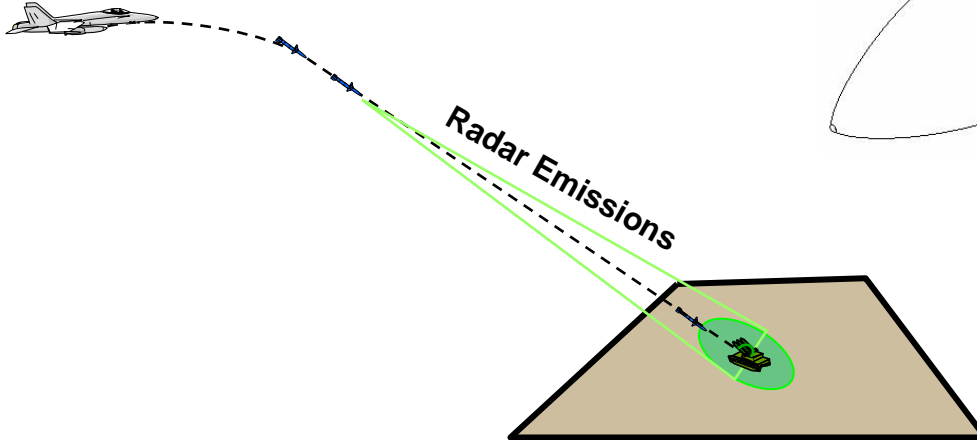
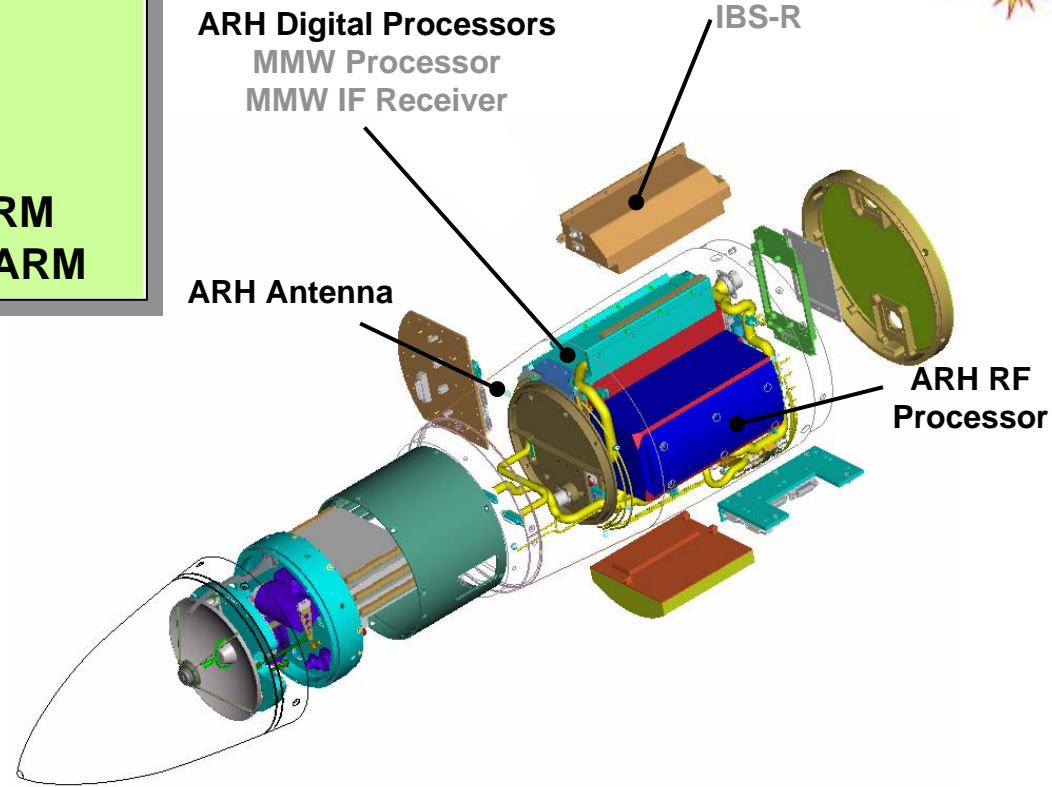
- ARH Seeker
  - Digital Receiver
  - Autonomous Detection and ID
  - Increased Field-of-View from HARM
  - Increased AOA Accuracy from HARM

ARH Digital Processors  
MMW Processor  
MMW IF Receiver

IBS-R

ARH Antenna

ARH RF Processor



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# Millimeter Wave Subsystem

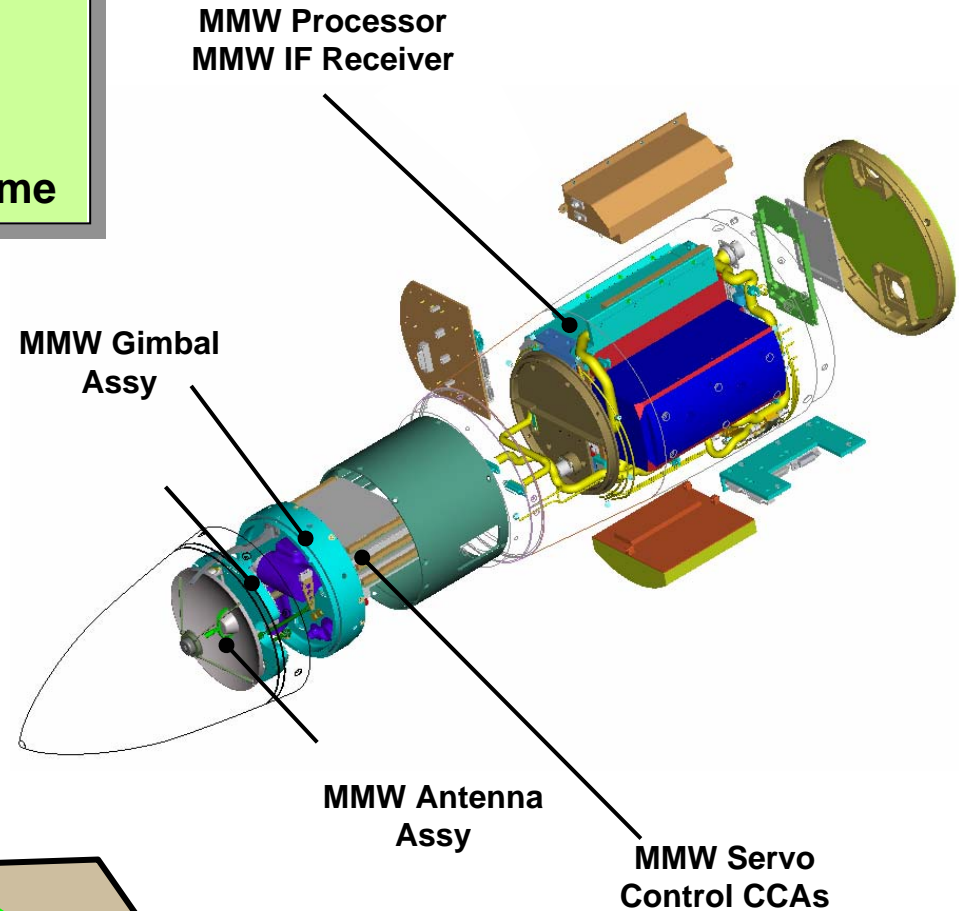
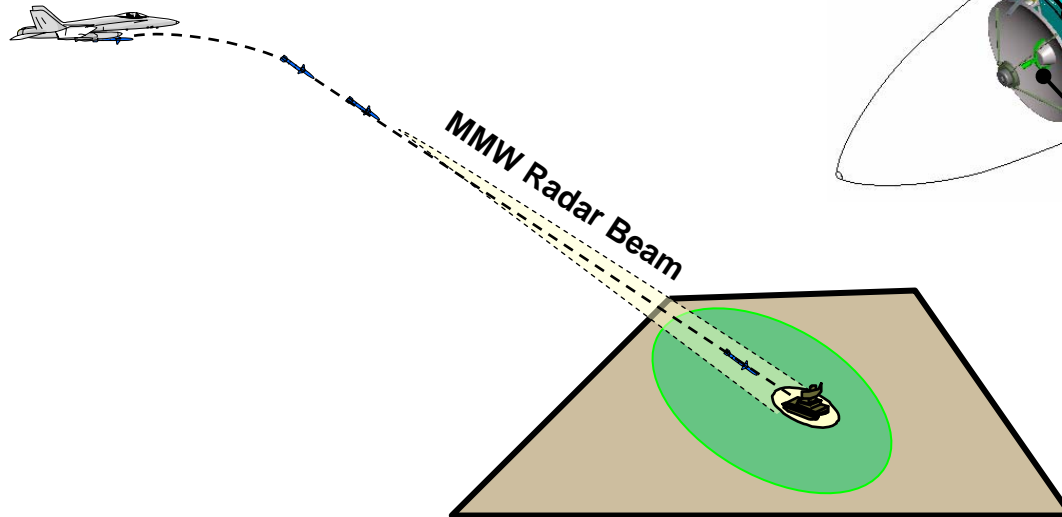


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## • Key Features

- MMW Seeker
  - Ball Joint Gimbal
  - High Power Solid State Xmtr
  - Rugged, High Temperature Radome



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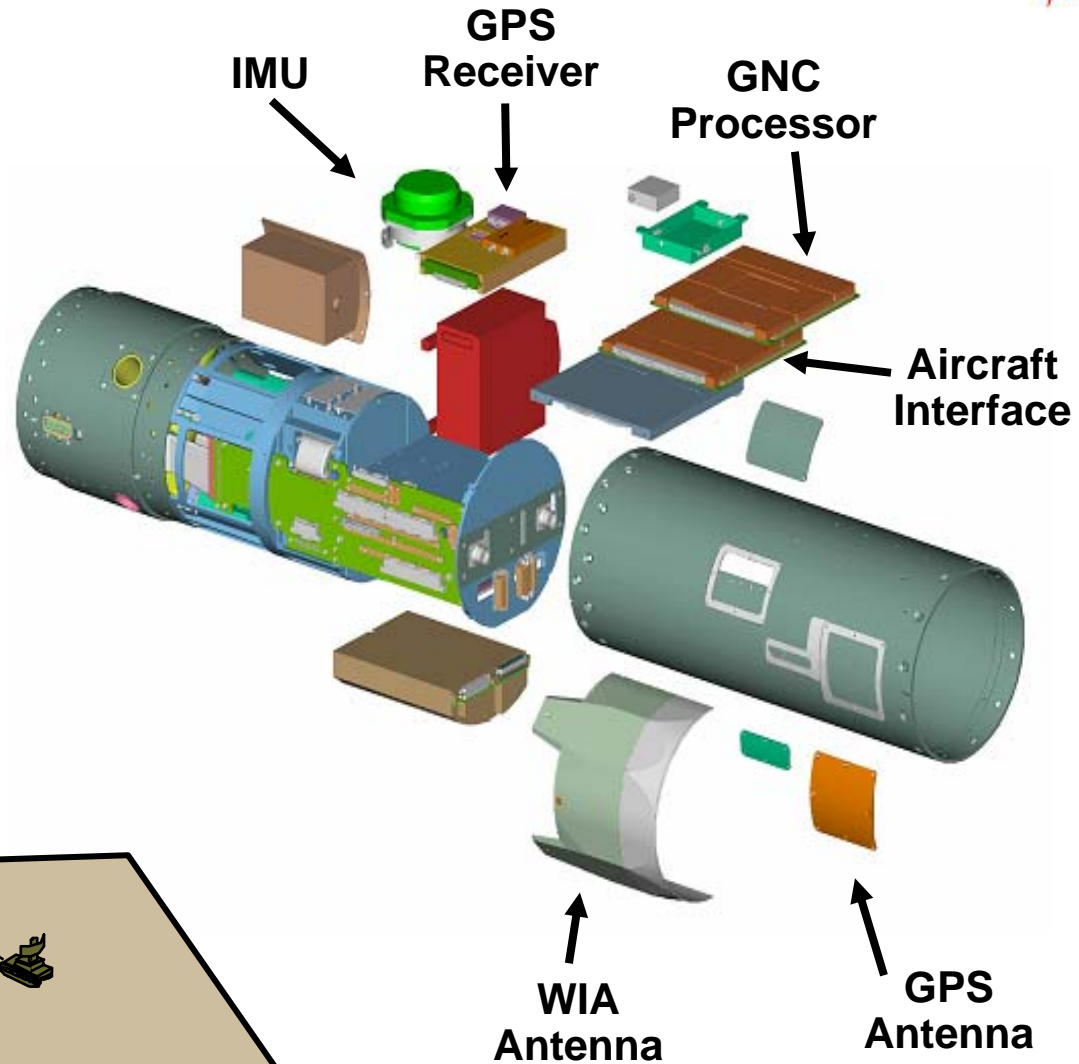
# Control Section and GNC Subsystems



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- **Key Features**
- **GNC Subsystem**
  - Tightly Coupled INS
  - A/C Transfer Alignment
  - Target Geo-location (DTED)
  - Geospecificity (IAZ,MIZ,AOR)
  - 1553 Interface Compatible
  - HARM Seeker Compatible



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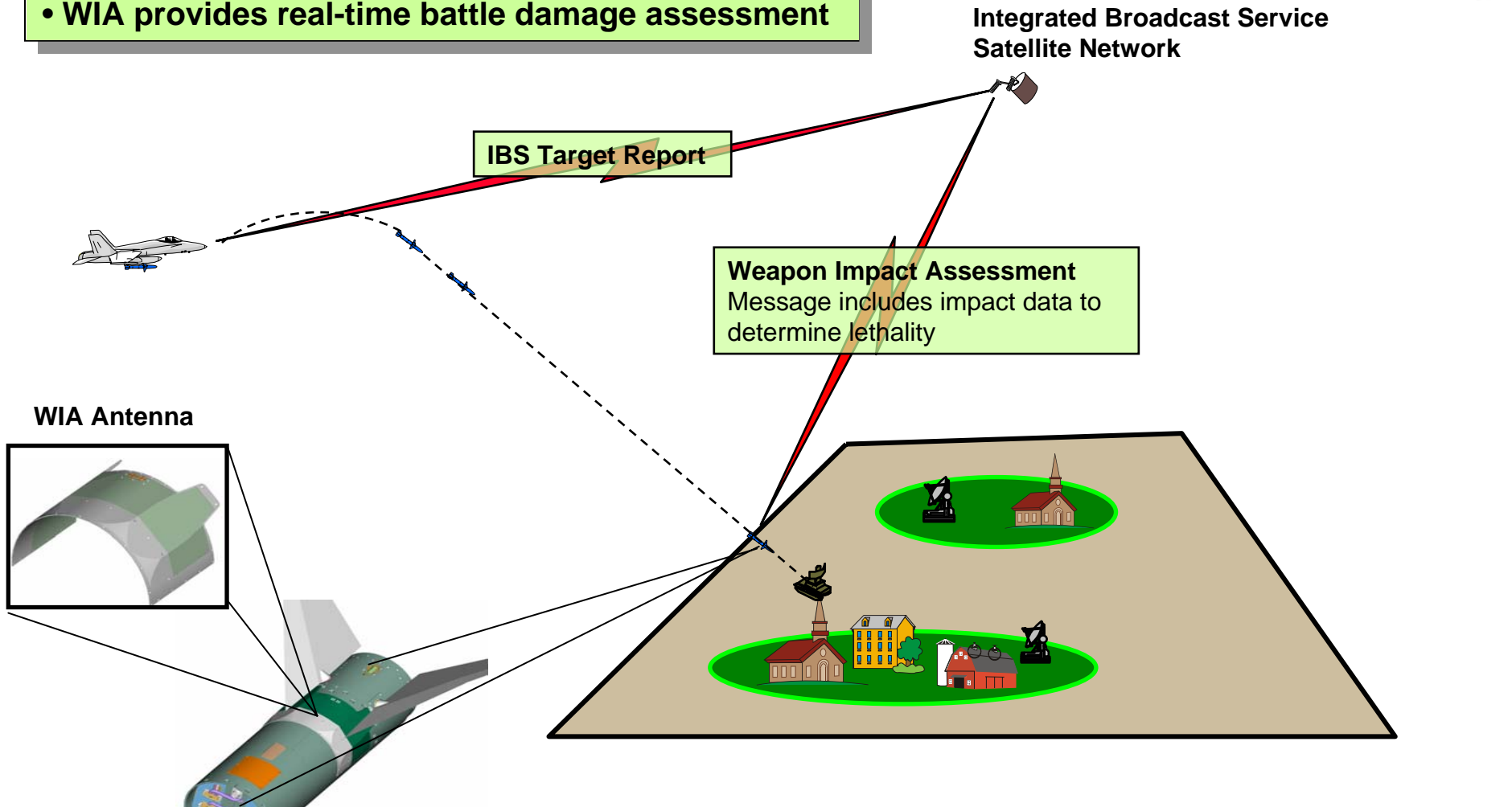
# Netcentric Capabilities



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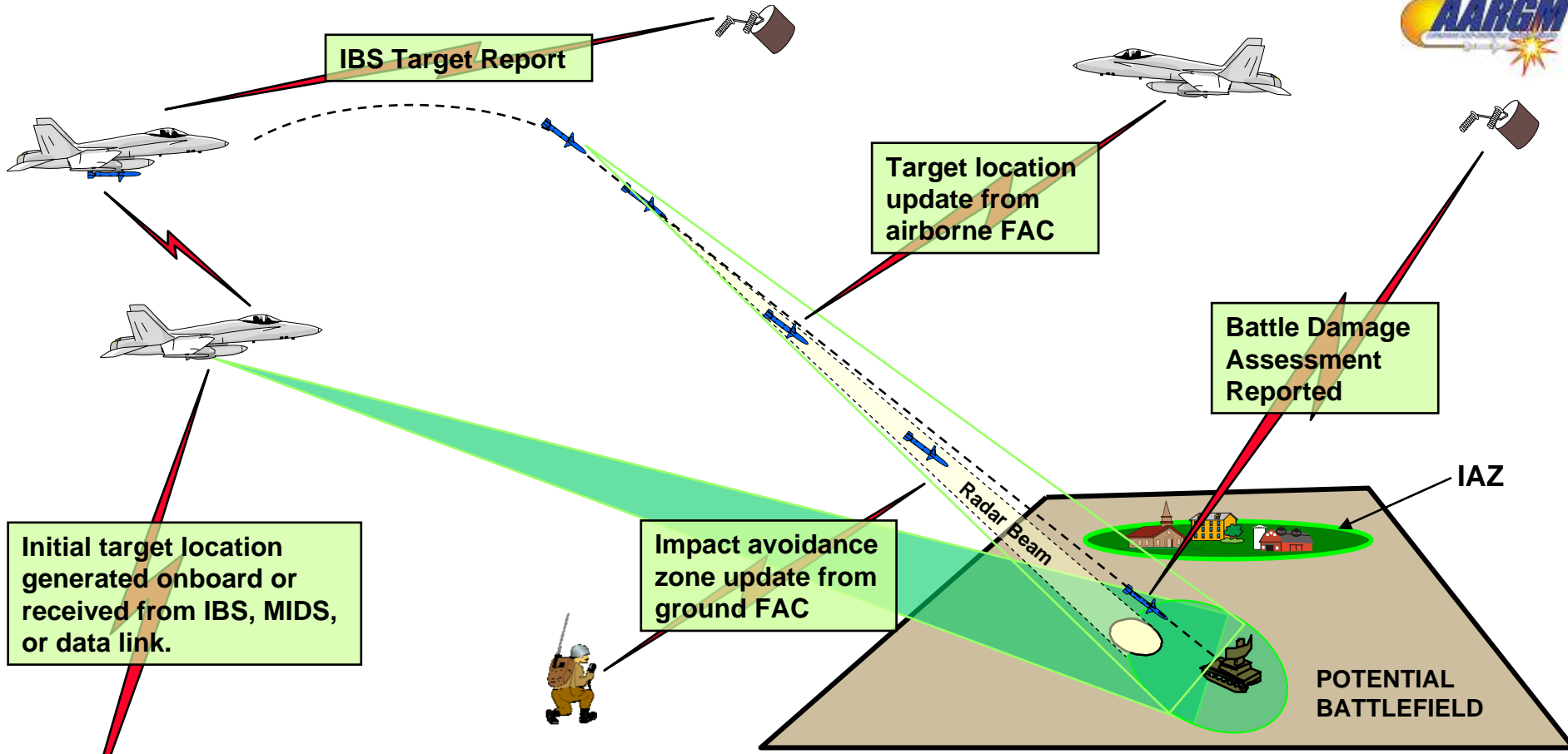


- IBS provides real-time target cue
- WIA provides real-time battle damage assessment



# Expanded Capability with Data Link Enabled AARGM

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Initial target location generated onboard or received from IBS, MIDS, or data link.

IBS Target Report

Target location update from airborne FAC

Battle Damage Assessment Reported

Impact avoidance zone update from ground FAC

IAZ

POTENTIAL BATTLEFIELD

Radar Beam

- Addition of a Two-Way Real Time Weapons Data Link
- Integration of all radio functions (WIA, IBS-R & WDL) into a single radio unit
- Enhanced targeting (end game accuracy, movers, non-emitters)
- Real-Time Impact Avoidance Zones (IAZ) Updates

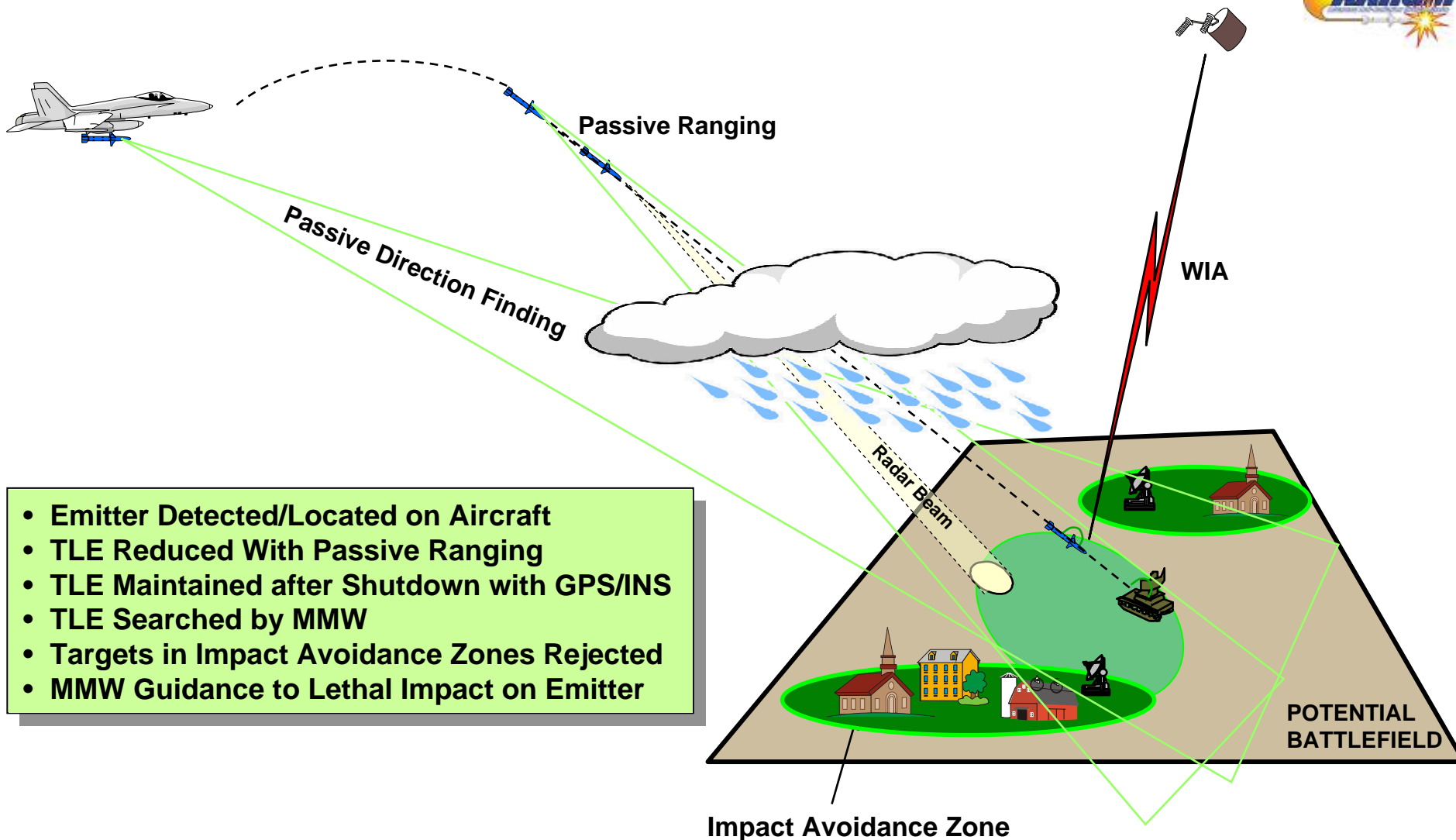


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# AARGM Engages a Target of Opportunity



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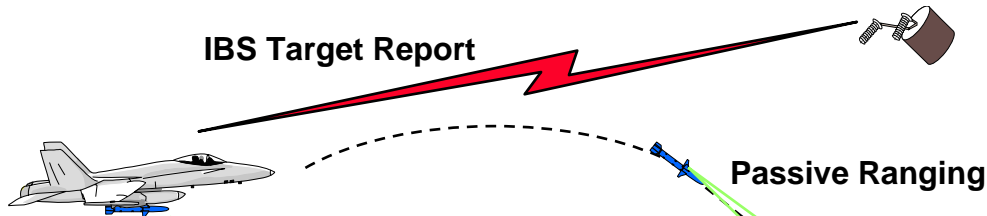
# AARGM Engages an Off-board Emitter Cue



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IBS Target Report



Passive Ranging

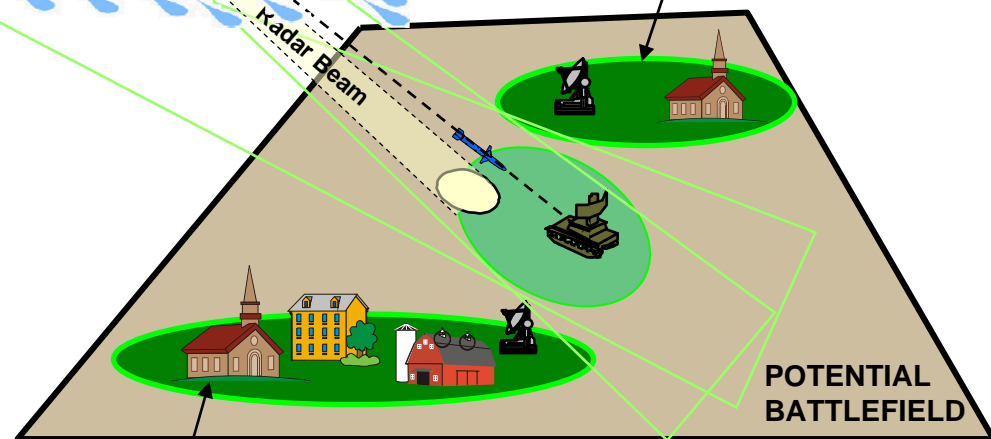
Correlated Target



Impact Avoidance Zone

- IBS Target Report Initiates Search
- IBS/AARGM Correlation
  - Reduces TLE
  - Satisfies ROE
- TLE Maintained after Shutdown with GPS/INS
- TLE Searched by MMW
- Targets in Impact Avoidance Zones Rejected
- MMW guidance to lethal impact on Emitter

Kadar Beam

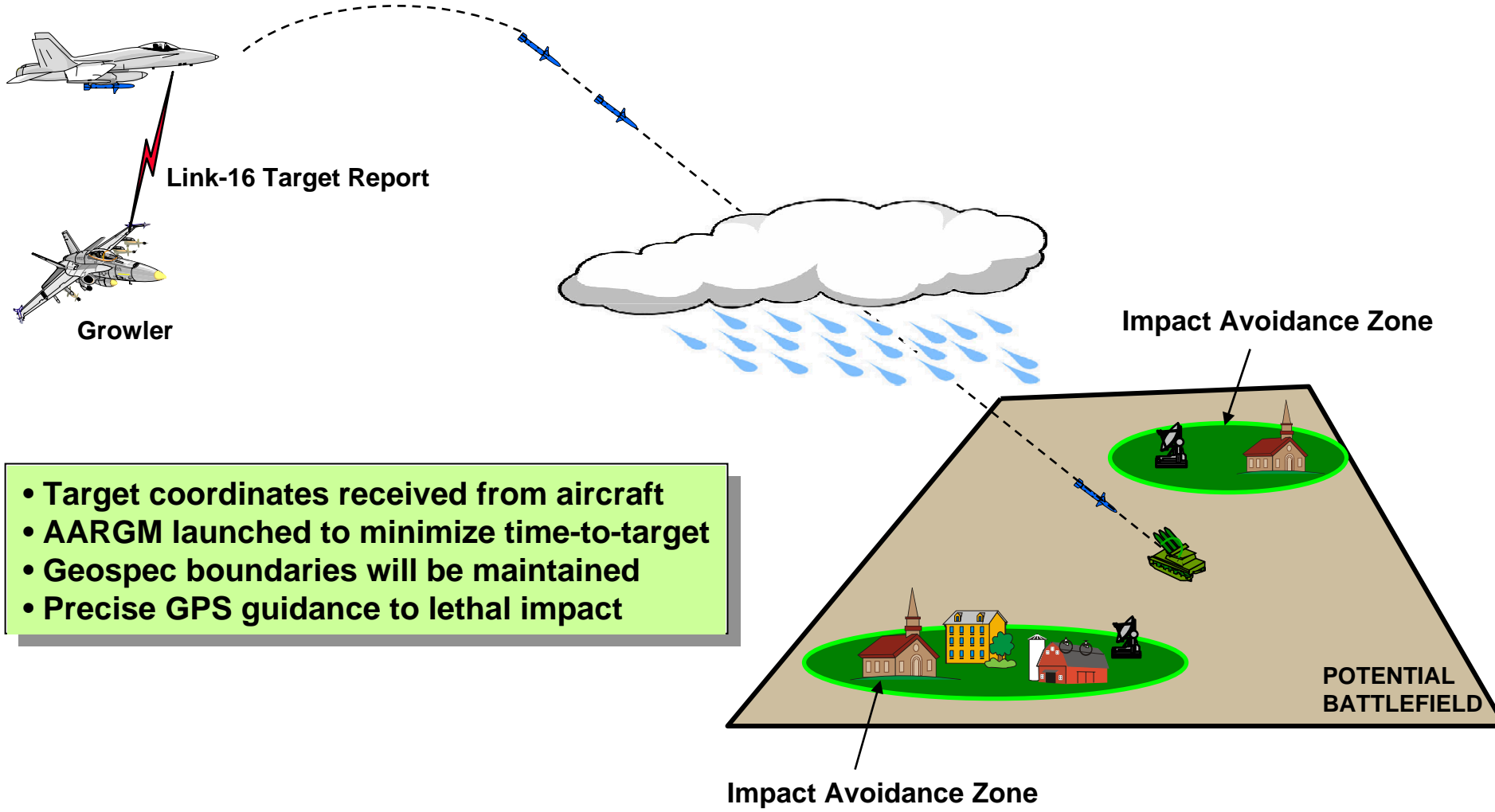


Impact Avoidance Zone

# AARGM Engages a Time-Critical GPS Target



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- Target coordinates received from aircraft
- AARGM launched to minimize time-to-target
- Geospec boundaries will be maintained
- Precise GPS guidance to lethal impact

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# AARGM Completes 8 Successful Launches



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- CTV-1: Point to Point GPS Guidance
- CTV-2: Point to Point GPS Guidance
- GTV-1: ARH Acquisition Before Launch
- GTV-2: ARH & MMW Terminal Guidance
- QB-1: ARH, MMW, WIA, IBS
- QB-2: ARH, MMW, WIA, IBS, Geospecificity, Emitter Shutdown
- DT-1: Point to Point Tightly Coupled GPS/INS Guidance
- DT-2: Pre-Briefed Cue, ARH Acquisition after launch, Geospecificity

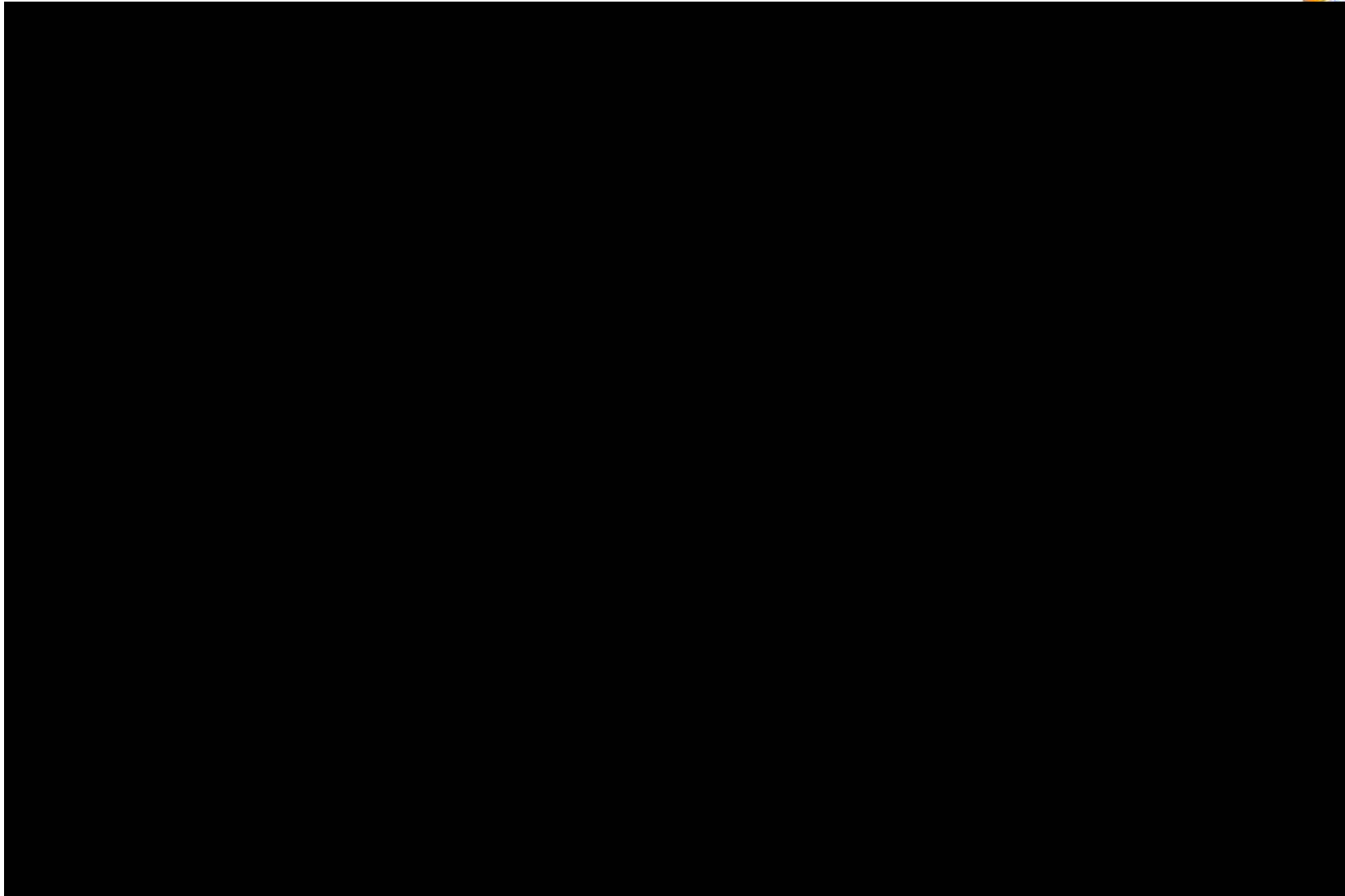


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# SD&D Development Test 1: May 25, 2007



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**Questions**



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