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The United States Army
Air and Missile Defense
Operational and Organizational Concept
for
The Future Force

Second Coordinating Draft
(Version 2.0)

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Directorate of Combat Developments
United States Army Air Defense Artillery School
Ft. Bliss, Texas

SUMMARY. The ***United States Army Air and Missile Defense Operational and Organizational Concept for the Future Force*** describes the interdependence of Army Air and Missile Defense (AMD) transformation with Army and Joint transformation. This concept describes the Future Operational Environment, the area-denial and anti-access strategies adversaries will employ, and the asymmetric aerial capabilities they will use against Joint and coalition forces. It describes how Army AMD will fight as part of the Joint team at strategic, operational, and tactical levels and identifies the required capabilities AMD forces must possess to successfully execute warfighting missions. Further, this concept describes the changes to scalable, modular, and tailorable future AMD force organizational concepts, force-wide warrior ethos and joint and expeditionary mindset, and a Joint AMD system of systems approach that will contribute to the attainment of Defense Transformation Planning Guidance (TPG) Operational Goals. Finally, this concept identifies the changes we will make in the areas of doctrine, organization, training, materiel, leadership and education, personnel and facilities to transform AMD to a *strategically responsive, deployable, agile, versatile, lethal, survivable and sustainable* force—a multifunctional force that is a critical enabler to the Future Force and an indispensable contributor to the Joint Operating Concepts (JOCs).

APPLICABILITY. The ***United States Army Air and Missile Defense Operational and Organizational Concept for the Future Force*** is both a functional and an organizational concept that will provide the basis for modernization and transformation of AMD forces. It will be used as a baseline for developing future AMD subordinate concepts, operational requirements, and organizational designs.

SUGGESTED IMPROVEMENTS. The proponent for this concept is the Air and Missile Defense Battle Lab, Directorate of Combat Developments, United States Army Air Defense Artillery School. Send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) through channels to Commandant, USAADASCH, ATTN: ATSA – CDB, Fort Bliss, TX 79916 – 3802.

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Chapter 1. Introduction

1-1. Purpose. The ***United States Army Air and Missile Defense Operational and Organizational Concept for the Future Force*** is a functional and an operational and organizational concept that describes how AMD forces will organize and fight with the other members of the Army, Joint, interagency, and multinational (JIM) team, contributing to victory on future battlefields. It is nested within the Joint and Army capstone concepts and supportive of Future Force concepts and time frames.

1-2. References. See Annex A.

1-3. Explanation of Abbreviations and Terms. See Annex B.

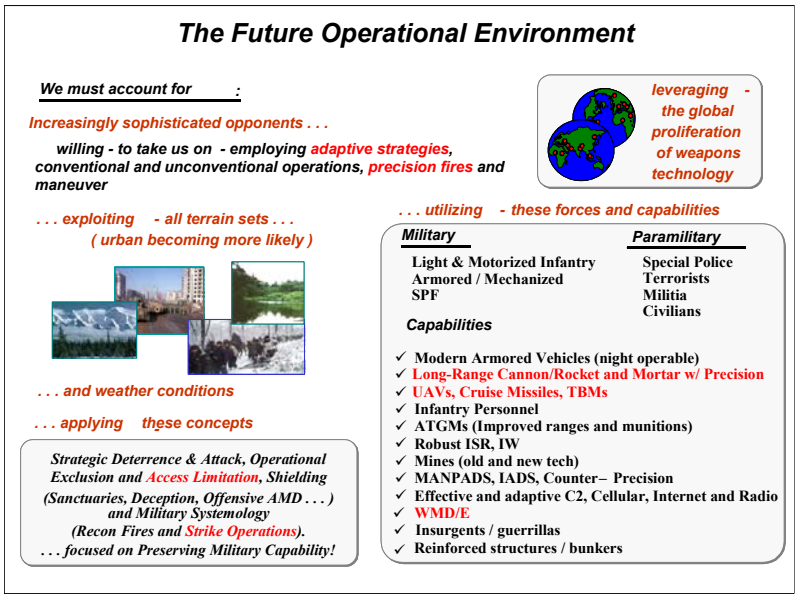
Chapter 2. Overview

2-1. Why This Concept Is Needed. Joint and Army AMD forces must transform to help achieve the operational goals described in the Defense Transformation Planning Guidance (TPG) in the future operational environment. AMD transformation is being shaped by changes in the future operational environment (including: anti-access strategies and a growing asymmetric air and missile threat); Strategic Planning Guidance and National Military Strategy (NMS); TPG operational goals[1]; Joint and Army Future Force concepts, force attributes, and characteristics; changes in technology; AMD lessons learned during Operation Iraqi Freedom (OIF) and in other operations, wargames, and experiments; and current Joint and Army AMD capability gaps. This concept provides a basis for the transformation of Army AMD forces as an interdependent part of Army and Joint transformation and serves as a baseline for development of AMD subordinate concepts, required operational capabilities, and force designs. Army AMD transformation will be institutionalized as a continuous process of change, significantly

[1] Transformation Planning Guidance, April 2003, pages 10-11. Also, see the QDR, pages 30-31.

impacting AMD doctrine, organizations, training, materiel, leadership and education, personnel and facilities (DOTMLPF). As in any successful operation, Army AMD transformation will be led by Soldiers and leaders exhibiting the warrior ethos and a joint, expeditionary mindset—Soldiers first, trained and educated and achieving joint experience earlier in their careers. Ultimately, the transformation will result in a more *versatile, responsive, adaptive, survivable and sustainable* AMD force that provides critical modular, scalable, mission-tailored, multifunctional capabilities for Army and Joint Force Commanders executing the Joint operating concepts of Stability, Homeland Security, Strategic Deterrence and Major Combat Operations (MCOs).

2-2. Operational Environment. The operational environment (OE) is defined in Joint doctrine as the "composite of circumstances, conditions, and influences that affect employment of military forces and bear on the decisions of the unit commander" (Joint Pub 1-02). In the future OE (FOE), Joint and coalition forces will face adversaries who have observed US operations and adapted to counter US strengths and exploit actual or perceived US weaknesses. These adversaries will employ both military and paramilitary forces with a wide range of capabilities shown in the figure below.[2]



[2] Adapted from TRADOC Pam 525-2-60, The Operational Environment and Threat: A View of the World to 2020 and Beyond, 15 October 2002, page 20, Figure 6.

Threat Environment.[3] Within this FOE adversaries will attempt to deny or delay access of US and coalition forces into theater through terrorism, information operations, and asymmetric air and missile threats[4]. Enemies will study US investment, or lack of investment, in capabilities and study how we operate. Joint forces will encounter asymmetric aerial threats at strategic, operational, and tactical levels. They will face potential threats at home, enroute, in theater, and throughout the fight. The enemy may employ asymmetric aerial threats such as long range ballistic missiles (BMs) or land attack cruise missiles (CMs) equipped with weapons of mass destruction/effects (WMD/E) in a coordinated anti-access strategy. Adversaries may use commercial space-based surveillance, world-wide media, and human intelligence to gain information on friendly force activity and intent and employ reconnaissance unmanned aerial vehicles (UAVs) to plan standoff attacks. Failing to prevent US intervention, the enemy will normally avoid direct contact with the superior US force. The threat may withdraw into urban/built-up areas or complex terrain, then plan and conduct ambushes or long range attacks, all with the intent to produce unacceptable casualties and weaken US public will and coalition resolve.

Threat Means. Adversaries means to accomplish these objectives are changing and growing. Adversaries may use aerial systems to attack the critical elements of Joint and coalition combat systems including links and C2 nodes that provide synergy of our system of systems. The use of this kind of combat systemology to isolate and attack specific elements of a system of systems provides an adversary with a means to dramatically degrade the combat capability of superior Joint and coalition forces.
More adversaries will attempt to acquire long-range ballistic and land attack CMs and WMD/E capable of striking the US homeland or allies in order to influence US and

[3] TRADOC Pam 525-2-60 and The Joint Operational Environment– Into the Future, 28 October 2003.

[4] Asymmetric approaches are attempts to circumvent or undermine US strengths while exploiting US weaknesses using methods that differ significantly from the United States' expected method of operations. Asymmetric approaches generally seek a major psychological impact, such as shock or confusion that affects an opponent's initiative, freedom of action or will. Asymmetric methods require an appreciation of an opponent's vulnerabilities. Asymmetric approaches often employ innovative, nontraditional tactics, weapons or technologies, and can be applied at all levels of warfare—strategic, operational and tactical—and across the spectrum of military operations. Joint Strategy Review 1999, Washington, DC: The Joint Staff, 1999, p.2.

allied/coalition decision making. Future threats possess advanced communications and signature reduction technologies to better coordinate their activities and frustrate friendly force targeting. Adversaries may use Global Positioning System (GPS) technology-enhanced weapons such as CMs, UAVs, improved tactical ballistic missiles (TBMs), and rockets, artillery, and mortars (RAM) in anti-access and ambush roles. Enemy launch points no longer are unit centric (massed) but rather weapon centric and leverage urban no fire zones and complex terrain to reduce vulnerability to Joint attack and deep-strike operations. U. S. forces face threats with increased precision and ranges, advanced warheads, active and passive protection systems, improved signature management capabilities, and night vision capabilities. These capabilities, and more, are readily available today in the world's arms markets. With regards to aerial threats, Joint Air dominance at high altitude against the current manned air threat has led to a proliferation of unmanned air and missile threats. Currently, there are over 150 different UAV programs, 80 cruise missile programs and 48 TBM programs world-wide.[5] UAVs and CMs can and are being made with parts available on the internet.[6] Anti-ship CMs can be converted into land attack variants or employed against land targets without modifications as witnessed in OIF[7]. BMs, large caliber rockets (LCRs), precision artillery projectiles, and mortars are proliferating at alarming rates and have been used extensively in recent conflicts.[8] Unmanned combat aerial vehicles (UCAVs) capable of carrying air-to-surface weapons are projected to replace today's manned aircraft fleets. Rocket launchers and mortars are increasingly being used to inflict casualties on US and coalition forces when force protection measures reduce the enemy's direct fire options. [9]

[5] Sources include National Air and Space Intelligence Center, Center for Defence and International Security Studies, and an article, *Ballistic, Cruise Missile Proliferation Worries US,* National Defense, October 2003.
[6] See *New Zealander Building Cruise Missile*, USA Today, 4 June 2003., in which a man from New Zealand assembled a CM in his garage with parts procured on the internet.
[7] 5 CSS C-3 CMs were fired. One narrowly missed a USMC assembly area. One damaged a shopping mall in Kuwait City.
[8] Over 400 surface-to-surface missiles were fired by Russian forces during the Chechnyan conflict. See *Russian Land-Based Precision Strike Missiles*, The Journal of Electronic Defense, March 2003, for a discussion on the development of precision missiles and their use in recent conflicts..
[9] Thirty American Soldiers were recently wounded in a mortar attack against a US base in Iraq. Many US Soldiers have died in rocket attacks. A makeshift multiple rocket launcher was employed from a park into a hotel in Baghdad. Such attacks occur regularly and are proliferating both in Afghanistan and Iraq. This trend will likely increase in future conflicts.

Threat Actions at the Strategic Level. At strategic level, adversaries may attempt to influence US, allied, and coalition resolve to commence offensive military operations, deny US efforts to achieve surprise, and try to achieve strategic preclusion. Enemies with long range missiles and WMD will attempt to complicate US decision making, allied support, and coalition building in the hopes of initiating regional transgressions while avoiding decisive American military action. Adversaries may attempt to achieve strategic preclusion through actions aimed at deterring Joint and multinational forces or limiting the scope and intensity of friendly operations. When American military action is viewed as imminent, adversaries may attempt to use terrorists, special operations forces (SOF), BMs, CMs, - - possibly with WMD/E warheads to threaten or attack decisive points within the United States, coalition countries, or allies outside the Joint Force Commander's (JFC's) joint operations area (JOA). These decisive points may include national capitals, population centers, seaports, airports, airbases, high value assets (HVAs), and other critical geopolitical infrastructure.[10] Terrorists may also commandeer commercial aircraft, employing them as "manned CMs" to destroy US and coalition geopolitical infrastructure, or use other aircraft such as crop dusters or UAVs to disperse chemical or biological agents in urban and industrial areas, to incite panic and cause mass casualties.

Threat Actions at the Operational/Theater Level. At operational level, adversaries will attempt to affect coalition formation and cohesion and deny the establishment of critical bases by the threat or use of BMs, CMs, and LCRs. Using area denial and anti-access strategies, as well as information operations, adversaries will attempt to prevent or limit and disrupt the employment of Joint and coalition forces into their regions. If US forces are successful in gaining theater access, adversaries will attack decisive points such as fixed and semi-fixed command and control (C2) facilities, staging areas, aerial

[10] Joint Senior Seminar Wargame (JSSWG) and other sources. (The JSSWG is a senior Army panel formed at the request of JTAMDO and Army G8 to examine the future requirements for theater air and missile defenses, assist in identifying appropriate roles and responsibilities of the Services, and provide specific guidance on Army programs. The JSSWG examined the vulnerabilities of US forces and infrastructure to air and missile threats that could be `employed by potential adversaries .)

ports of debarkation (APODs), sea ports of debarkation (SPODs), air bases, key logistic areas and active lines of communication (LOCs) using terrorism and long-range precision strikes.[11] The enemy will attempt saturation attacks, likely with a mixture of BMs, CMs, lethal UAVs, and LCRs. Missile ratios, the location of critical land and sea bases of operation in proximity to enemy missile ranges and the ability of future joint airlift to support operational maneuver from strategic distances where anti-missile to missile ratios are the most favorable are important planning considerations for MCOs[12]

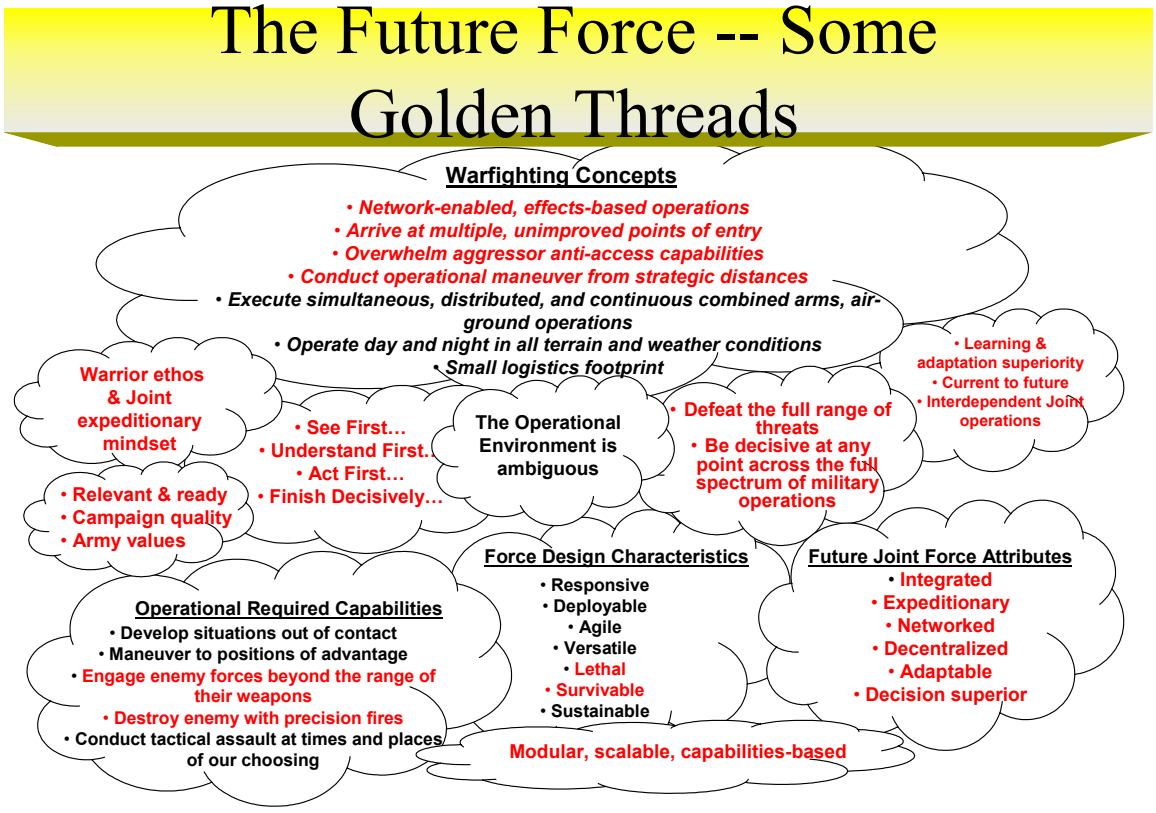
Threat Actions at the Tactical Level. At tactical level, adaptive adversaries will employ 360 degree asymmetric attacks on a distributed, non-contiguous battlefield when confronting technologically superior Joint forces. They will employ advanced reconnaissance, surveillance, and target acquisition (RSTA) capabilities including UAVs and special purpose forces equipped with sophisticated communications to surveil, locate, and target Joint forces and high value assets (HVAs). Adversaries will then attack at decisive points including Joint vertical, horizontal and littoral entry sites, semi-fixed C2 facilities, key logistics areas, active LOCs, and HVAs such as aviation assembly points and logistical facilities. In these attacks, adversaries will employ RAM, UAVs, CMs and TBMs. After these attacks, adversaries may withdraw to sanctuaries in complex or urban terrain and attempt to draw Joint forces into areas where they are vulnerable to missiles, RAM, and unconventional warfare. Capitalizing on US casualties, actual or fabricated collateral damage, and civilian deaths, adversaries will attempt to degrade US public support via a sophisticated international media campaign designed to cause the withdrawal of US military forces.

2-3. Capstone Warfighting Concept. The ***United States Army Air and Missile Defense Operational and Organizational Concept for the Future Force (AMD O&O) fully*** supports the Army's vision of future operations described in the capstone concept

[11] JSSWG and other sources.

[12] See Annex C Appendix 1 for discussion of vulnerability to enemy saturation attacks and considerations for Operational Maneuver From Strategic Distances (OMFSD) from zones where anti-missile to missile ratios are more favorable

(TRADOC PAM 525-3-0, ***U. S. Army Objective [Future] Force Concept***), subordinate Unit of Employment, Unit of Action, and functional concepts, and the recently published Army Transformation Roadmap. The figure below highlights some of the "big ideas" or "golden threads" of Army Future Force concepts.



The AMD O&O concept embraces employment of modular, scalable, mission-tailored, multifunctional AMD forces where and when they are required, at strategic, operational, and tactical level across the range of military operations. It describes the AMD transformation goals that will enable AMD to become more strategically responsive, deployable, agile, versatile, lethal, survivable and sustainable. It highlights how AMD supports future force operations and enables Units of Action (UAs), Units of Employment (UEs) and Joint forces to conduct operational maneuver from strategic distances; deploy through multiple, unimproved points of entry; overwhelm hostile anti-access capabilities; and *see first, understand first, act first and finish decisively*.to decisively defeat the enemy. It promotes an AMD force with a Joint and expeditionary

mindset and highlights the need for flexible, adaptive, confident, and competent Soldiers and leaders imbued with the warrior ethos.

2-4. Joint Concepts. The ***AMD O&O*** fully supports the Department of Defense TPG, Joint Vision 2020, the Joint Operations Concepts including the capstone Joint Operating Concept (JOpsC) and Joint operating concepts: Stability Operations, Homeland Security Strategic Deterrence and Major Combat Operations (MCOs) concepts.[13] It also supports all available draft Joint Functional Concepts (JFCs) and enabling concepts. Like these concepts, it promotes enhanced warfighting capabilities through conceptual, operational and organizational innovation and contributes directly to the Joint force capabilities for battlespace awareness, Joint C2, maneuver, engagement, protection and focused logistics. This concept embraces the Joint force attributes of a *fully integrated, expeditionary, networked, decentralized, adaptable, decision-superior and lethal force* and attainment of the operational goals mandated in the TPG - - *Protect critical bases, Project/Sustain in anti-access/area denial environments, Deny enemy sanctuary, Ensure information operations/assurance and space capability/survivability,* and *leverage information technologies for Joint C4ISR.*

2-5. Other Concepts. The ***AMD O&O*** fully supports the Army Vision as well as Army operational concepts including the US Army Objective [Future] Force Operational and Organizational Plan for the Maneuver Unit of Action (TRADOC Pam 525-3-90) and the Maneuver Unit of Employment Concept (TRADOC Pam 525-3-92). It is also consistent with relevant portions of other existing or draft concepts such as Homeland Security (TRADOC Pam 525-3-07), Force Projection (TRADOC Pam 525-3-25), Special Operations (TRADOC Pam 525-3-5.30), Army Maintenance Transformation (TRADOC Pam 525-4-43.1), Aviation Concept (TRADOC Pam 525-3-04), Fires and Effects Concept (TRADOC Pam 525-3-9), Battle Command C4ISR Concept (TRADOC Pam 525-3-0.1), Maneuver Support Concept (TRADOC Pam 525-3-25), Maneuver

[13] Army AMD's mission capability set is included in the Joint Protection Functional Concept. Lessons learned from AAMDC integration of Operational Force Protection in OIF are helping to inform the emerging Army Force Protection Concept.

Sustainment Concept (TRADOC Pam 525-4-0), Space Support Concept (TRADOC Pam 525-3-14) and Soldier as a System Concept. Like these concepts and other supporting functional concepts, the AMD O& O concept emphasizes dominance across the spectrum of operations and supports the future battlespace construct of non-contiguous, multi-dimensional, precise, distributed and simultaneous operations.

While Joint operational architecture products and key interface profiles are currently lacking, the AMD O & O Concept is flexible to accommodate them. AMD is participating in the Joint Single Integrated Air Picture (SIAP) Working Group and other efforts to ensure AMD C4 concepts and capabilities are nested with Joint.

Lessons Learned. In addition to nesting with Joint and Army Future Force concepts, the ***AMD O&O*** incorporates key lessons learned from previous wars, joint training exercises, wargames, and experiments. Historically, joint AMD capabilities have lagged one war behind thinking, adaptive enemies (see figure __ below). The AMD O&O seeks to get out - - and stay out - - in front of future adversaries while enabling future force operational goals.

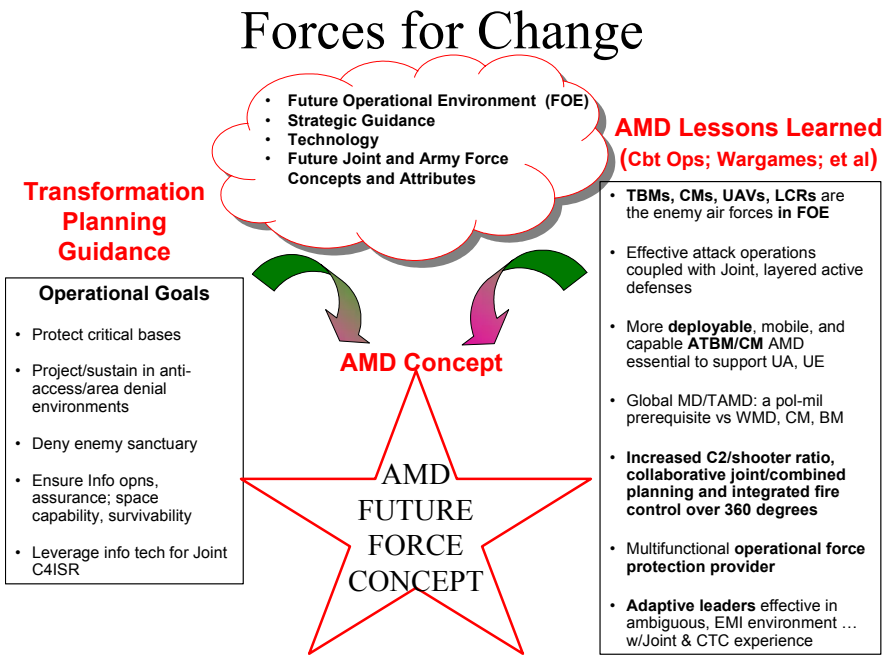
Red Air/Blue AMD Capability Gap Analysis

Time/Primary Air Threat		Key Joint Capabilities	Lessons /Gaps
Cold War	**Warsaw Pact Air Forces and Missile Arsenal** **Predictable threat**	**Massive US/NATO HAWK & PATRIOT belt defense in Western Europe w missile stocks; Organic gun/ missile ADA in all units** **Defensive counter-air**	**- No anti-missile capabilities**
ODSS	**Iraqi Scud Missiles** **Large, doctrinal launch points** **Linear battlefield**	***Initial PATRIOT anti-missile capability*** **Dedicated sorties for attack operations**	**- ISR and attack operations poor– 0 TEL kills in 4,862 Scud hunt sorties** **- Initial PATRIOT limited– no warhead kill**
OIF	Underestimated Iraqi SRBM #s, sophistication; decoys, launch points in urban, NFZs. Initial use of CMs, Rockets, Precision Artillery, UAVs Non-contiguous battlefield	**12 years of Operation Southern Watch condition setting** ***Space-enhanced JIM attack operations and SOF launch point denial*** ***PATRIOT GEM, GEM +, PAC 3***	**- No elevated sensor/ 360 degree CMD** **- No mobile 360 degree AMD vs TBM, CM, UAV, LCRs, precision artillery** **- Joint integration, C2-shooter ratio, and target classification lacking**

Historically, AMD capabilities have lagged one war behind thinking, adaptive enemies.

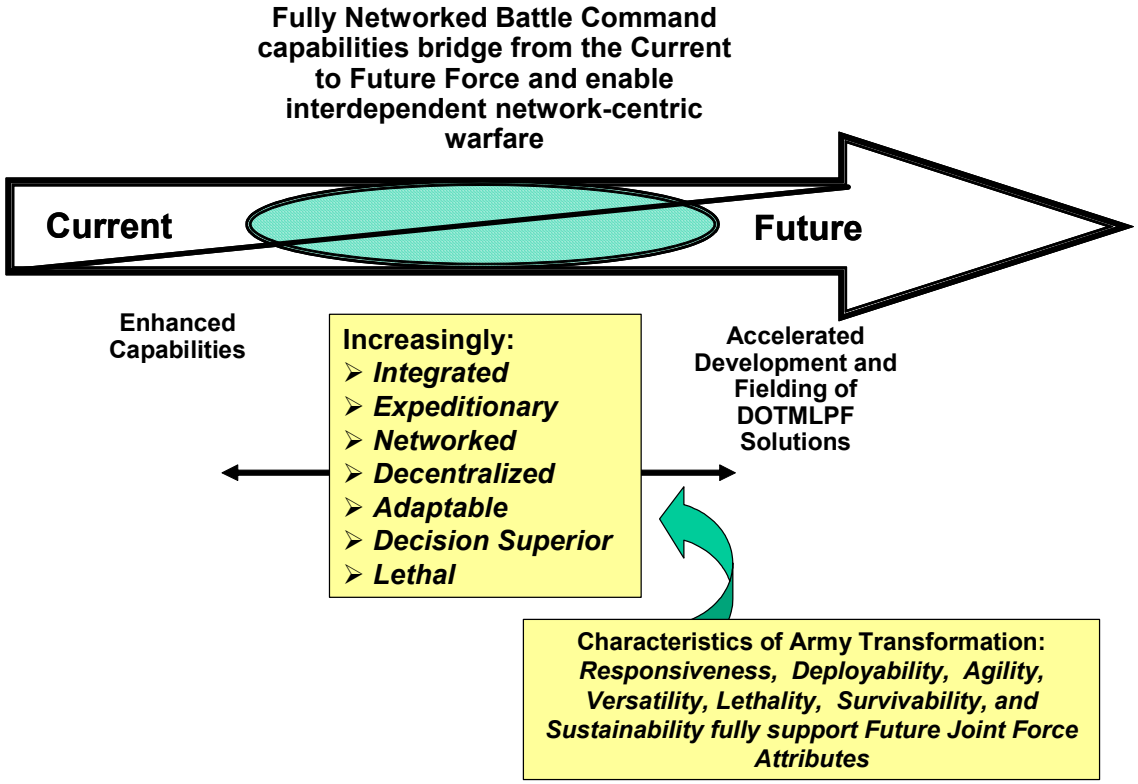
Lessons learned in Operation Iraqi Freedom (OIF) and in Joint wargames and experiments underscore that AMD is truly a Joint venture, requiring effective Joint attack operations coupled with Joint and layered active defenses. Lessons learned include the fact that manned aircraft are a less relevant and less significant portion of the threat order of battle - - the current and future enemy air forces are comprised of TBMs, CMs, UAVs, RAM. Both in OIF and future force wargames, a clear lesson learned is the need for more strategically deployable, tactically mobile, and capable AMD that can overmatch the full spectrum of air and missile threats, with integrated fire control and modular 360 degree capabilities, on the non-contiguous battlefield. OIF highlighted the need for elevated sensor capability to detect CMs. OIF also showed an urgent need for increased C2 to shooter ratios and better joint and combined training. Wargames highlight that Global Missile Defense and Joint Theater Air and Missile Defense (JTAMD) are political, as well as military, pre-requisities for offensive operations against

WMD/missile-equipped foes. OIF was the first conflict in which Joint Rear Area (JRA) operational force protection was integrated by a single headquarters and a number of lessons learned are being incorporated into this concept and emerging Army and Joint Protection concepts. All assessments of AMD in support of the NMS show the need for regionally focused, theater level C2 headquarters to integrate offensive and defensive AMD and contribute to other aspects of operational force protection. OIF lessons learned underscore the criticality of ensuring AMD leaders are adaptive and effective in uncertain, ambiguous, electro-magnetic interference (EMI)-cluttered environments and the need to emphasize Joint and combined arms training experiences. These and many other lessons learned played a major role in the formulation of this AMD current-to-Future Force transformation.



Enroute to the desired end state, Army AMD will pull as many capabilities forward from the future to enhance the current force as technology and resources will allow. Army AMD is integrated into the Chief of Staff of the Army's (CSA's) and Training and Doctrine Command's (TRADOC's) focus area "task force" efforts. The figure below depicts the Army current to future construct.

EVOLVING ARMY TRANSFORMATION



AMD leaders will shape required behavioral changes and a transformational culture shift that will enable more rapid adaptation of processes and DOTMLPF solutions. AMD leaders will fostering a culture of innovative, bold and positive change that will promote the warrior ethos and joint, expeditionary mindset, enabling AMD to stay ahead of current and future adversaries and fully support future force concepts. Ultimately, this transformation will lead to revolutionary operational change (Chapter 3), organizational change (Chapter 4), new required capabilities (Chapter5) and DOTMLPF solutions (Chapter 6).

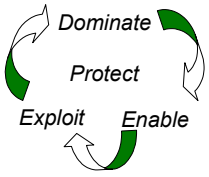
Chapter 3. Operational Concept

3-1. Operational Foundation. The Army is pursuing the most comprehensive transformation of its forces in the past century as part of the Joint effort to transform America's military to protect national security interests in the future operational environment. AMD transformation is an essential part of achieving the capabilities required for Joint and Army Future Force success.

AMD Transformation will be shaped by changes in the future operational environment, Joint and Army concepts, lessons learned and other factors. Collectively, these factors are compelling forces for comprehensive changes in AMD DOTMLPF.

The desired warfighting end state of AMD transformation efforts is the attainment of the following vision:

> *We will provide Joint and combined arms warriors with mission-tailored capabilities to **dominate**, **enable** and **exploit** the third dimension battlespace and **contribute to operational force protection** in support of UA, UE, and Joint Commanders in the Future Operational Environment.*



AMD Transformation Imperatives. The four elements highlighted in the vision statement—*Dominate, Enable, Exploit and Protect*—are imperatives that will help focus AMD transformation. Each element of the *Dominate-Enable-Exploit-Protect* cycle contributes synergistically to the other elements. The spiraling effect of this cycle will enable Joint forces to achieve four of the six Defense TPG operational goals - *protecting critical bases of operation*; *projecting and sustaining US forces in distant anti-access and area-denial environments and defeating anti-access threats*; *denying the enemy sanctuary* (in the third dimension)*, and leveraging information technology for Joint C4ISR*

operations. Current Joint AMD forces, while performing superbly during OIF, are inadequate to fully meet the *Dominate*, *Enable*, *Exploit*, and *Protect* imperatives in the emerging FOE. Army AMD transformation will address applicable capability gaps as part of a larger Joint AMD transformation effort.

Dominate the Third Dimension. Army AMD will help *dominate* the third dimension, interdependently with JIM forces, at strategic, operational, and tactical levels, through Joint attack operations; Joint, layered active defense operations; Joint passive defense measures; and integrated battle command. Modular, scalable, multi-functional Army AMD formations will be employed when and where required to *deter and dissuade* adversaries from using air and missile threats. Army AMD forces will *reduce the warfighting options* available to adversaries. Army AMD will help integrate and execute JIM offensive and defensive operations to *deny enemy launch points* and kill enemy air and missile threats *on the ground* before they can be launched. Mission tailored AMD will also destroy enemy aerial RSTA beyond standoff, contributing to friendly force ability to *see first* by forcing the enemy to *see last* (or not at all). Army AMD will proactively kill *in the air* during *midcourse and terminal phases of flight*, at sufficiently long ranges to preclude warheads or target debris from harming friendly forces or assets.

Enable the Third Dimension. Army AMD will help *enable* the third dimension and contribute to Information Superiority by integrating its sensor and battle command elements into the joint distributed network and providing continuous surveillance information that will contribute to the single integrated air picture (SIAP) portion of a three-dimensional common operational picture (COP). These AMD sensors and battle command elements will provide Joint third dimension situational awareness and understanding (SA/SU); provide Army linkage to the Joint identification (ID)/engagement authorities; facilitate planning, coordination and synchronization of airspace activities and linkage to the Joint Airspace Control Authority (ACA); help enable trajectory clearance for ground-to-ground, ground-to-air and air-to ground fires; and protect friendly aerial objects.

Exploit the Third Dimension. By *dominating* and *enabling* in the airspace, Joint and coalition forces can better *exploit* it for their exclusive operational benefit. AMD and Joint forces will *exploit* the third dimension by using it to conduct inter- and intra-theater *Operational Maneuver from Strategic Distances* and to sustain non-contiguous forces via air. Modular, multi-functional AMD task forces (TFs) will be deployable on C130/future force airlift and will help enable the force to *project and sustain in an anti-access environment* by *protecting critical bases of operation* and protecting *Joint vertical entry forces*. Army AMD ground and elevated sensors will provide extended range surveillance of aerial and ground targets that can be exploited to support offensive and defensive non line-of-sight (NLOS) engagements. Army AMD elevated sensors will be multi-functional platforms providing long endurance communications relays to distribute actionable information to enable commanders to effectively integrate, coordinate and synchronize warfighting operations with dispersed forces on the non-linear battlefield. Army AMD and Joint forces will leverage space and aerial ISR capabilities to support Joint attack operations and provide early warning of air and missile attack to at-risk forces and civilian populations.

Integrate/Contribute to Operational Force Protection. Army AMD, working closely with JIM forces, will contribute to integrating theater operational force protection in support of the Joint Force Land Component Commander (JFLCC) and or Joint Force Commander. The functional tasks associated with operational protection integration during OIF included offensive and defensive theater air and missile operations (TAMO), NBC reconnaissance and defense, HVA protection, route security, physical security, operations security, defensive information operations, anti-terrorism operations, host nation integration, food and water security, and post-attack impact mitigation. The multi-functional theater level AMD command post, augmented with Military Police, Chemical and other key expertise, recommended operational force protection priorities to the Commander; led theater operational protection boards; oversaw vulnerability assessments of JRA priorities, recommended protection measures needed to optimize the JIM force's protection stance and monitored execution/sustainment. In addition to integrating operational protection for CJFLCC, AMD forces contributed to maneuver commander

force protection at tactical levels, providing mission tailored forces for actions and operations such as convoy protection and active LOCs protection. AMD will continue to be a key contributor to operational force protection in the current and future force construct.

AMD Warfighting Mission Sets. To implement these imperatives, multi-functional Army AMD will contribute to the larger Joint effort to accomplish four interdependent missions:

- *Provide Air and Missile Defense*: Includes all Joint and combined arms measures to detect, acquire, identify, destroy or nullify, and conduct kill assessment of aerial threats, on the ground or, if needed, in the air, with emphasis on deterring or defeatingTBMs, CMs, UAVs and LCRs in a theater of operations. The four operational elements or "pillars" of the Provide Air and Missile Defense mission set are Attack Operations, Active Defense Operations, Passive Defense Operations, and AMD C4I. Some of the related Universal Joint Task List (UJTL) and AUTL tasks include, amongst others, *Provide Theater Aerospace and Missile Defense (ST 6.1), Organize and Coordinate Theater Missile Defense (ST 6.15)*; *Organize and Coordinate Theater Air Defense (ST 6.1.4)*, *Counter Enemy Air Attack* (OP 6.2.4), *Provide Missile Defense for the JOA* (OP 6.1.5)*, Prepare to defend against air attack and aerial surveillance (ART 4.1), Process tactical aerial platforms (ART 4.2), Destroy aerial platform (ART 4.3), Deny enemy use of airspace (ART 4.4).*

- *Contribute to Third Dimensional SA/SU*: Actions and capabilities that provide visualization and understanding of the current and potential activities in the third dimension battlespace. In addition to seeing and knowing the airspace and the objects that fly or may fly[14] in it as part of a COP. Situational understanding is

[14] AMD contributes to Intelligence Preparation of the Battlefield (IPB) to assess potential enemy third dimension use and to help target it from source to storage and infrastructure locations to routes to launch points, reload and hide areas, etc.

the product of applying analysis and judgment to the IPB and the COP in order to draw timely and accurate METT-TC conclusions and contribute to decision superiority. While some aspects of this mission set are unique, most aspects of this mission set are inherent in the other three. Some of the related UJTL and AUTL tasks include, but are not limited to: *Collect and Share Operational Information (OP 2.2)*, *Determine Enemy's Operational Capabilities, COA, and Intentions (OP 2.4.1.2)*, *Support Tactical Warning and Attack Assessment in Theater* (ST 6.*16), Provide Tactical Warning and Attack Assessment in JOA (*OP 6.1.6)*, Collect and Share Operational Information (OP 2.2), Search for Aerial Platforms (ART 4.2.1), Detect Aerial Platforms (ART 4.2.2), Locate Aerial Platforms (ART 4.2.3), and Characterize Aerial Platforms (ART 4.2.4).*

- *Contribute to Airspace Management*: Actions and capabilities that enable fires and manned and unmanned airspace users in a JIM environment while protecting friendly forces, ensuring the synchronized use of airspace, and enhancing the command and control of forces using that airspace. Some of the related UJTL tasks include *Establish and Coordinate Positive ID Procedures for Friendly Forces in Theater (ST 5.1.9)*, *Provide Airspace Control (OP 6.1.3)*, *Employ Positive Control Measures (OP 6.1.3.1),* and *Employ Procedural Control Measures (OP 6.1.3.2), Establish and Coordinate Positive Identification Procedures for Friendly Forces in Theater (ST 5.1.9), Provide Positive Identification of Friendly Forces within the JOA (OP 5.1.11).*

- *Integrate/Contribute to Operational Protection*: Actions and capabilities to contribute key protection capabilities and synchronization of JIM and Army contributions to the overall protection stance. These include integration of offensive and defensive Theater Air and Missile Defense, including all operational elements or "pillars", and integration of/contribution to other aspects of Operational Force Protection. The desired endstate of theater level protection actions is to conserve the warfighting capabilities of the joint force, making

service members, systems, facilities, essential personnel and formations difficult to surveil, strike, or destroy. This includes helping to identify the strategic and operational centers of gravity and related friendly decisive points, forces, and critical assets and protecting them from conventional and unconventional attack, to include the effects of WMD/E. The Joint Protection Functional Concept includes activities to *detect, assess, warn, defend, and recover* in order to protect personnel, physical assets, and information. Close integration with related preemptive and offensive operations is critical to success. At tactical levels, maneuver commanders dynamically task organize organic and augmenting forces to integrate protection capabilities with fire and maneuver as required by METT-TC. AMD is a key multi-functional contributor. [15] Some of the related UJTL tasks include, but are not limited to: *Provide Theater Protection (ST 6)*, *Provide Operational Protection (OP6), Protect the Force (TA 6), Organize and Coordinate Theater Air, Missile Defense (ST 6.14/6.15), Coordinate Protection for Theater Forces and Means (ST 6.2), Establish and Coordinate Protection of Theater Installations Facilities, and Systems (ST 6.2.6.2), Establish and Coordinate Theater Air, Land, and Sea Lines of Communications (ST 6.2.6.3)*, *Obtain Multi-national Support Against Non-military Threats (ST 8.3.4),* and *Assist in Combating Terrorism (ST 8.4.2).*

AMD Mission. The following mission statement is derived from analysis of the Joint AMD imperatives and the four mission sets Army AMD performs:

> Army Air and Missile Defense (AMD) forces, fighting interdependently with other elements of the JIM team at strategic, operational, and tactical levels, will *provide AMD and contribute to situational awareness /understanding, airspace management, and operational force protection* in order to *deter or defeat enemy aerial threats, protect the force and high value assets, enable freedom to operate, and contribute to victory.*

[15] Protection Joint Functional Concept. AMD is a key "mission capability element" of this concept.

Provide AMD Mission Set Operational Elements ("The Four Pillars")

Attack Operations. The preferred method of eliminating air and missile threats will always be to kill on the ground prior to launch. Attack operations include offensive actions intended to destroy and disrupt enemy air and missile capabilities before, during and after launch. The objective of these operations is to prevent launch by attacking each element of the overall system, including such actions as destroying RSTA platforms, C2 nodes, and missile stocks and infrastructure. [16]

*Active Defense Operations***.** Active air defense includes direct defensive action to destroy, nullify or reduce the effectiveness of hostile air and missile threats against friendly forces and aircraft (JP 3-01). Even with envisioned advances in joint ISR and attack operations capabilities, the joint force will depend heavily on active defense AMD to execute the highly complex, time-sensitive, asset intensive operations necessary to protect the force and critical bases of operation from asymmetric air and missile attacks.[17]

*Passive Defense Operations***.** Passive defense operations include employing any measures to reduce the vulnerability of forces to the effects of enemy RSTA platforms, attack platforms, BMs and CMs, RAM, with potential biological, chemical, and WMD/E warheads. This includes operations that provide essential individual and collective protection for friendly forces, population centers and critical assets. The principal measures used to accomplish passive defense are tactical warning, reducing targeting effectiveness, reducing vulnerability, and recovery and reconstitution. (JP 3-01.5)

AMD C4I Operations. Operations involving the command, control, communications, computers and intelligence system that links passive defense, active defense, and attack operations to provide timely assessment of the threat (to include IPB); rapid dissemination of tactical warning; and mission assignment, targeting data, and post strike

[16] Paraphrased from JP 3-01.5.

[17] JSSWG.

assessment to the appropriate Joint theater missile defense element. For each operational element, the C4I system must provide rapid communications among intelligence assets, the fusion and decision-making facilities, warning systems, and weapon systems, to include a capability for rapid coordination with supporting combatant commanders (JP 3-05.1)

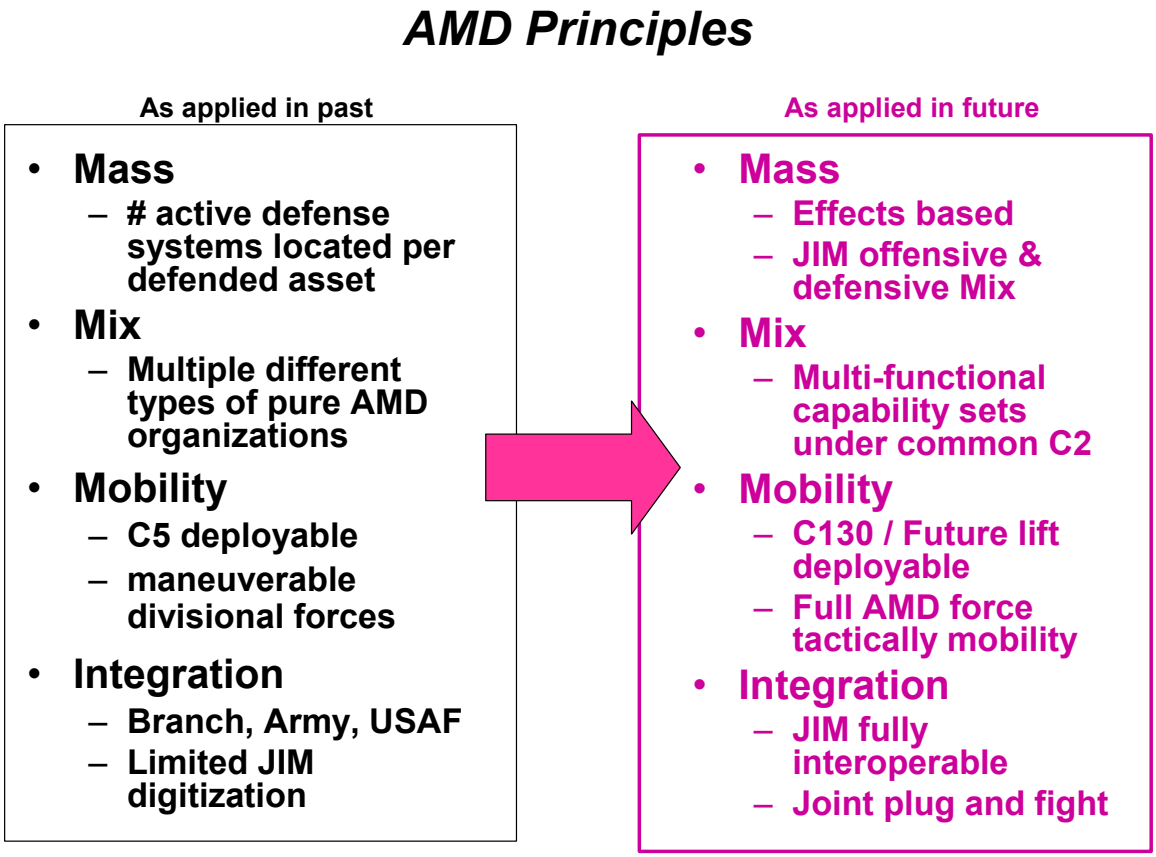
Army AMD Mission Sets: Where We are/Where We are Going

The following table provides a broad overview of capabilities that multi-functional Army AMD will bring to the JIM fight in each of the four mission sets:

Army AMD Warfighting Mission Set Capabilities		
Today	**2010**	**2017**
Provide Air and Missile Defense		
Joint team's only proven TBM killer; Multifunctional Divisional AMD Divided SHORAD/HIMAD SHORAD reactive & overmatched; Sectored SRBM defense	Interoperable C2 Increasingly Proactive AMD 360 degree CMD Integrated Fire Control Add MRBM, IRBM killer Initial Global Missile Defense	Common C2; Modular, mission tailored AMD TFs; 360 degree mobile ATBM; Add RAM, VSRBM killers; Robust Global Missile Defense
Contribute to Third Dimensional Situational Awareness/Understanding		
Stovepiped air picture Over- matched by enemy RSTA	Distributed Joint air picture, enhanced by aerostats; AMD overmatches UAVs	SIAP as part of COP multi mission sensor capability
Contribute to Airspace Management		
G3 Air Procedural Deconfliction ADAM cell in SBCTs	Dedicated ADAM cell Automated procedural deconfliction; Air and ground SA/SU/COP	Network-centric Responsive and Enabling
Integrate & Contribute to Operational Force Protection		
Ad hoc OFP C2 role in OIF One AC AAMDC Improving balance between Offensive & Defensive AMD	Doctrinal OFP Restructured in support of 1-4-2-1 strategy; Increased Jointness in TAMD C2	UEy AAMDCs, TPCs, Joint, embedded in support of GCCS; GAMDF, AAMDC for Global MD, Homeland Air security

AMD Warfighting Principles

Army AMD forces will fight differently in the future. While the doctrinal principles of *mass, mix, mobility,* and *integration* will still be applicable, the way AMD forces will apply these principles will be markedly different. The figure below highlights some of the major differences between how the current force applies AMD principles and how these same principles will be applied by the future AMD force.

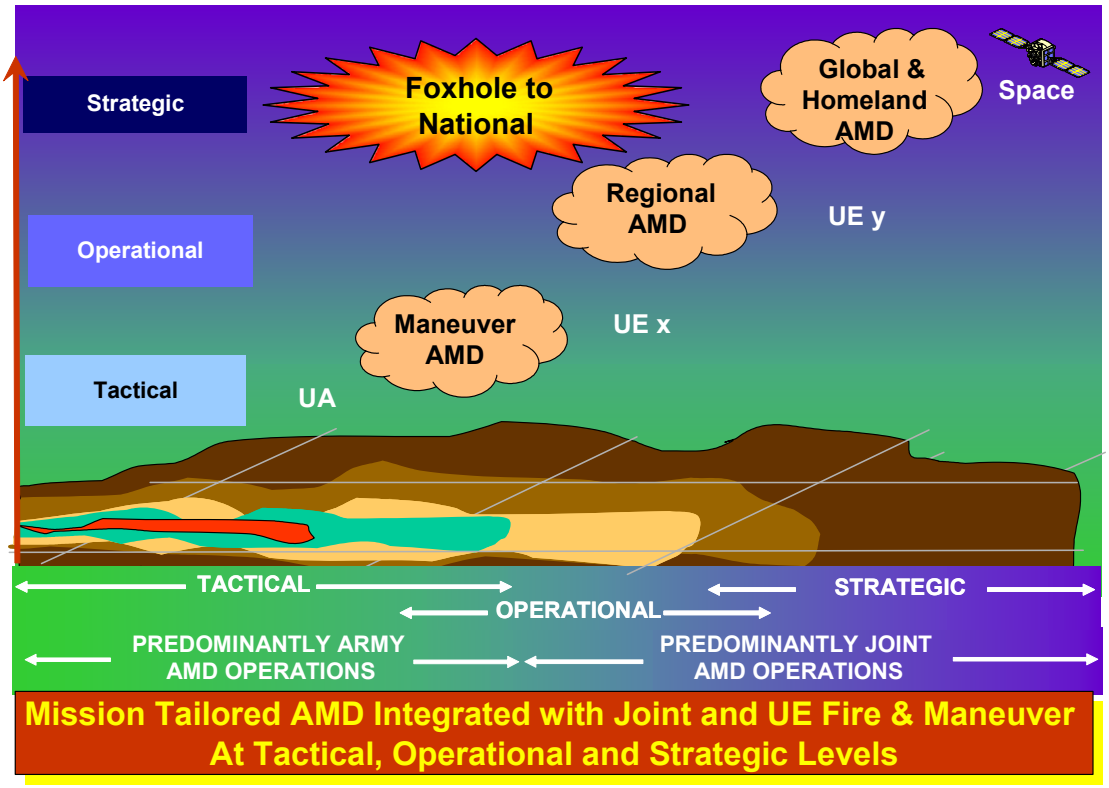


3-2. Concept

3-2.1 Introduction. JIM forces will conduct simultaneous and overlapping operations at the strategic, operational, and tactical levels of war. At each level, during Strategic

Deterrence, Homeland Security, Stability Operations or MCOs, Army AMD will integrate with JIM forces where and when required to ensure mission accomplishment. Army AMD will contribute modular, scalable, warfighting capabilities to provide AMD and contribute to third dimension SU, airspace management, and operational force protection across the range of military operations.

Simultaneous and Overlapping AMD Operations



3-2.2 Strategic level: Army AMD in Support of Global Missile Defense and Homeland Air Security.

3-2.2.1 Effects-Based AMD Intent. The effects-based intent of AMD operations in support of Global Missile Defense and Homeland Air Security is to deter, preempt, or defeat conventional and asymmetric air and missile attacks against the Homeland and

allies between the Homeland and the JFC's JOA[18], assure Americans and allies, and enable options for aggressive offensive military operations.

ARMY AMD in GLOBAL MISSILE DEFENSE & HOMELAND AIR SECURITY

Task/Purpose: Provide ground-based AMD in support of Global Missile Defense and Homeland Air Security in order to deter/defeat air and missile threats against the Homeland and allies who are between the Homeland and MCO JOA

Concept:
- Dedicated C2 to plan and coordinate defensive aspects of Global Missile Defense & Homeland Air Security with STRATCOM, NORTHCOM and Joint and Interagency forces
- Employ Ground-based midcourse defense to anchor a Joint, layered active defense to counter ICBMs and IRBMs
- When required, employ tailored Theater AMD TFs to protect designated assets and allies between the Homeland and the MCO JOA.
- When required, employ mission-tailored AMD TFs, working interdependntly with Joint & Interagency forces, to defend designated Homeland assets/activities against CMs and asymmetric aerial attacks

End State: Homeland and allies are assured/protected from asymmetric air & missile attacks. President & SECDEF retain options for offensive military opns despite enemy IRBM, ICBM and WMD capabilities

Requires:
- AMD C2 (GAMDTF and a dedicated AAMDC) integrated with STRATCOM, NORTHCOM, Joint C4ISR and space-based early warning
- Ground-based midcourse defense capable of defeating ICBMs, IRBMs, MIRVs
- Tailored AMD TFs, integrated with Joint and Interagency forces, capable of destroying CMs, BMs, and preventing commandeered aircraft from hitting their targets

3-2.2.2 Army AMD Concept of Operations. Future Army AMD forces will provide critical capabilities to support Global Missile Defense and Joint and interagency Homeland Air Security operations. These will be ongoing missions in support of the NMS with or without increased tension or MCO execution.

Global Missile Defense and Homeland Air Security Command and Control. AMD will maintain dedicated command and control structured to plan, integrate, and coordinate Army AMD support to Global Missile Defense and Homeland Air Security. The C2 headquarters will be Joint and networked with critical STRATCOM, NORTHCOM, NORAD and JIM C4ISR elements. It will collaboratively plan and

[18] Theater AMD capabilities provide AMD inside the supported JFC's MCO JOA. Global Missile Defense and theater AMD efforts are coordinated as appropriate.

execute Global Missile Defense and Homeland Air Security operations while exchanging situational awareness and early warning information. These efforts will be closely integrated with related attack operations, passive defense, and C4I efforts in forward regions and inside the Homeland. As required, subordinate command and control headquarters will be attached and employed to provide command and control to multiple mission-tailored AMD TFs on a regional basis, in or outside of CONUS. In the future force, these headquarters may not have the historical number of shooters typically associated with such a headquarters but are required in order to conduct the JIM enabling functions inherent in Homeland Air Security and other AMD missions. Army AMD command and control will be closely integrated with the Joint, interagency, and or multi-national ID, engagement, and airspace control authorities.

Global Missile Defense to Protect the Homeland. As part of the JIM Global Missile Defense fight, Army AMD will employ standing Ground-Based Midcourse Defense and deploy tailored modular, scalable, multi-functional AMD TFs. These capabilities will be part of a responsive, layered offensive and defensive system capable of deterring, preventing or defeating air and missile threats against the Homeland. Global Missile Defense will be closely integrated with Global Strike Operations for *attack operations,* as well as *passive defense* efforts. The *active defense* pillar of Global Missile Defense will be comprised of layered air, ground and sea-based segments capable of engaging and destroying all classes of BMs and CMs as well as other aerial threats. Global Missile Defense forces will have connectivity, coordination, and integration with the AMD forces and activities fighting inside a JFC's JOA. Examples of such activities include attack operations or SOF launch point denial missions against long range missiles and sharing of relevant sensor data, intelligence and early warning.

Defensive *air segments* of the Global Missile Defense active defense pillar will include assigned on-call Joint and multinational fighter aircraft capable of intercepting and destroying aircraft and designated airborne laser capability to attrit long-range ballistic missiles during their *boost phases* of flight. The *sea-based segments* will include Naval ballistic missile defense (BMD) capabilities that destroy ballistic missiles during their

midcourse phases of flight over the ocean approaches to friends, allies, or the Homeland. The *ground-based segments* will include Ground-Based systems capable of destroying ballistic missiles during their *midcourse phase* in the endo- or exo- atmosphere, at altitudes that will preclude ground effects of WMD/E. Future ground-based AMD capabilities may potentially include the ability to kill missiles while they are still in the boost phases of flight[19]

Global Missile Defense to Protect Friends/Assets Between the Homeland and JFC JOA. Tailored Army AMD task forces may also be deployed as part of the Global Missile Defense effort. They will generally deploy in a permissive environment to regions or areas that are in between the Homeland and the JFC's JOA in order to help protect allies or coalition partners against IRBMs, MRBMs, CMs, or other asymmetric aerial threats. They will be modular (can insert/extract different capabilities) and scalable (can vary the number of sensors and shooters as required). They will leverage common C2 and integrated fire control to automatically tailor effects required to different targets and to clear ground to air fires with certified crews in accordance with established Joint rules of engagement. The tailored AMD Task Forces will be multi-functional, contributing to the *AMD,* contributing to *third dimension SU* with ground and aerial sensor employment and battle command capabilities*,* contributing to *Airspace Management* success by integrating with the Joint and multinational ID, engagement and airspace management authorities*, and contributing to Operational Force Protection* through AMD and multi-functional contributions to the local force protection stance. . Collectively, the air, sea, and ground-based segments of Global Missile Defense will enable multiple engagement opportunities in order to minimize the impacts of geography on each individual system, reduce the risks of WMD/E, maximize the probability of kill, and to defeat as far away from the Homeland or defended asset(s) as possible.

JIM Global Missile Defense stance and responsiveness will be maintained through recurring exercises, foreign military sales, forward stationing of missile systems, and

[19] Missile Defense Agency is leading an effort to achieve ground-based boost phase kill effects.

security assistance missions that provide for the training, education, and general support of multinational AMD forces.

Homeland Air Security Operations. To support Homeland Air Security operations, Army AMD will deploy tailored task forces to areas within the US as part of a layered Joint and interagency integrated AMD network. While entry operations are unopposed, the interagency coordination, public visibility, and tight rules of engagement create unique deployment, employment, and execution challenges for AMD leaders and Soldiers. These AMD TFs will protect designated critical assets and symbols of national power such as the National Capitol, major cities, seaports, power-projection platforms, National Security Special Events (e.g.,the Olympics and Super Bowl), and other critical elements of national infrastructure from aerial threats. In all of these situations, the AMD task forces will be integrated and networked with JIM land, sea, air and space sensors and C4 elements to facilitate early warning, combat identification, long-range cueing, and target detection and to contribute to local *situational understanding, airspace management, and the local protection stance.* The AMD Task Forces will have common C2 with Joint integrated fire control, capable of employing the right combination of sensors and shooter capabilities required to see and destroy the full mix of anticipated air and missile threats. They will be scaled in size based upon the nature of the projected threat, the number and size of the areas to be defended, the specific assets and resources to be protected, and other factors of METT-TC.

The figure below summarizes the interdependent joint ends, ways, and means for Global Missile Defense and Homeland Air Security operations.

Army AMD Global Missile Defense & Homeland Air Security

AMD Effects-Based Intent (Ends)	AMD Required Capabilities (Ways)	JIM Contributions needed (Means)	Army Contributions (Means)
Missile & Asymmetric Aerial attacks against Homeland & Allies ***deterred*** NCA options for offensive military operations ***unaffected*** by missile threats Enemy attempts to strike Homeland, allies outside RCC's AOR with ICBMs, IRBMs, CMs ***preempted or defeated*** Enemy attempts to strike Homeland w/asymmetric aerial attacks ***preempted or defeated***	STRATCOM planning and integration of JIM ISR,Global Missile Defense, Global Strike NORTHCOM planning, integration of JIM, Homeland Air Security Global Strike Layered, Global Missile Defense fires (boost phase mid-course) vs ICBMs, IRBMs, warheads Homeland Air Defense -Combat Air Patrols -Ground based air defense vs Homeland asymmetric air threats (CMs, commandeered aircraft, etc.)	JIM ISR Global Strike Boost phase killer Sea-Based Mid-Course Defense Coast Guard Joint Air FAA SOF	AMD C2 embedded in STRATCOM, NORTHCOM Ground-based Mid-Course Defense Army Space Mission-tailored Army AMD capabilities

3-2.2 Operational Level: *Army AMD in the UEy, Joint Theater AMD (JTAMD)Fight*

3-2.2.1. Effects-Based AMD Intent. The effects-based intent of AMD in support of theater operations will be to assure regional multinational partners and preserve basing options; ensure unimpeded projection and sustainment of forces; deter, preempt or defeat enemy asymmetric aerial attacks; protect critical bases of operation; enhance the theater commander's third dimensional SA/SU; enable the commander's fires and friendly use of airspace; and deter, preempt or defeat terrorist attacks.

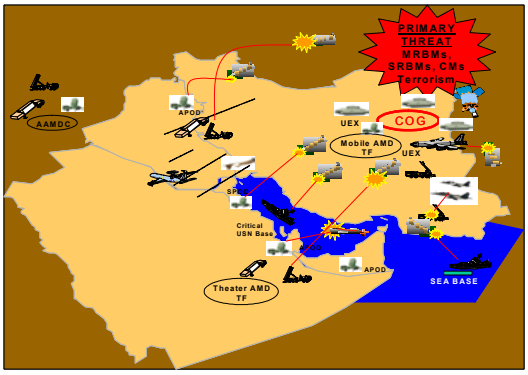
3-2.2.2. Army AMD Concept of Operations. Army AMD will employ AAMDCs and theater AMD task forces to support UEy and JTAMD during entry, shaping, decisive, and sustaining operations.

AAMDC & THEATER AMD IN SUPPORT OF UEy, JTAMDO

Task/Purpose: Integrate offensive and defensive JTAMD in order to defeat enemy anti-access, destroy MRBMs, SRBMs and CMs, protect critical bases and assets, and contribute to situational understanding, airspace management and operational force protection

Concept:
- Dedicated AAMDC plans, coordinates and integrates JTAMD for UEy, JFCs
- Theater AMD Brigade deploys multiple, tailored AMD TFs to protect dispersed bases, HVAs, against MRBMs, SRBMs, CMs, LCRs as part of Joint, layered active defense
- AAMDC deploys to integrate attack operations, Joint layered active defenses and passive defense; contribute to integration of operational force protection
- AMD TF C2, linked to Joint ID, engagement and airspace control authority, C2s dispersed AMD fight
- Employs C2 ground and elevated TF sensors to contribute to situational understanding and airspace management

End State: Critical theater high value assets are protected, airspace use and SA/SU/ISR are enabled, enemy sanctuary is denied, projection/sustainment forces are unimpeded and enemy asymmetric aerial attacks are defeated.



Requires:
- Dedicated AAMDC located with NEA, SWA, UEy HQ with attack operations, active defense, passive defense, C4 and operational protection cells
- Commo, C2, integrated fire control and scalable batteries capable of
  - ✓ Operating independently, often in a separate country
  - ✓ Defeating MRBMs, SRBMs, CMs, LCRs (360 degrees)
  - ✓ JIADS-compliant fire direction & EW; linkage with SIAP
  - ✓ Ground, elevated sensors
- Rapid deployability

UEy Entry Operations. Theater Army AMD formations offer modular, scalable capabilities that provide our President and Secretary of Defense, and JFCs, strategic deterrence options against enemy long- range air and missile attacks. These capabilities contribute to establishment of a protective shield under which theater critical bases of operations can be established as required to support projection and sustainment of decisive force. Recurring exercises, foreign military sales, forward stationing, and improved AMD deployment capabilities help to more quickly achieve the required protection stance and may help reduce enemy certainty about friendly intent and timelines. Regionally dedicated AAMDCs will plan, integrate and synchronize theater air and missile defense operations in support of the JFLCC, Combined Forces Land Component Commander (CFLCC) or JFC. The AAMDC Commander is "dual-hatted", supporting both UEy and serving as the Deputy Area Air Defense Commander (DAADC). The AAMDC will develop and execute plans for countering enemy anti-

access strategies, orchestrate AMD support of theater level entry operations and integrate/contribute to operational force protection, thereby preempting or defeating aerial, terrorist and other types of attacks and ensuring that Joint and multinational forces and warfighting capabilities flow to and through entry points without interruption. During entry operations, the AAMDC's early entry command post (EECP), if not already in theater, will rapidly deploy to the JOA and will be accompanied by rapid deployment forces (RDF)[20] of tailored AMD capability to deter or defeat air and missile threats to early entry forces or critical bases. The EECP exercises battle command for a short period until the full AAMDC CP is deployed. Common AMD C4 and additional AMD capability will supplement the AMD RDF. Their arrival will be synchronized with the flow of Joint forces and METT-TC conditions. These subordinate theater AMD formations will provide integrated fire control over the combination and amount of scalable AMD batteries required by METT-TC to protect dispersed land-based entry sites by conducting cooperative engagements with other Joint and multinational AMD elements.

UEy Shaping, Decisive, and Sustaining Operations. During shaping, decisive, and sustaining operations, theater AMD formations and Joint and combined arms contributors will continue to take the fight to the enemy with aggressive offensive and defensive theater air and missile operations and an aggressive operational force protection stance. The focus of Theater AMD operations will be to preempt, deter or defeat enemy attempts to shape the fight and to protect critical bases and warfighting capabilities. AMD ground and elevated sensors will contribute to a robust Joint and multinational air picture that will be incorporated into the SIAP to provide commanders with situational awareness/understanding. AMD network and leadership help enable safe and efficient airspace use and fires. The AAMDC and theater AMD capabilities will contribute to integration and execution of operational force protection.

Fighting the Four AMD Mission Sets at UEy Level.

[20] In the past, AMD rapid deployment forces have sometimes been referred to as "Minimum Engagement Packages"

Provide AMD.

Attack Operations. The AAMDC will participate with Joint and multinational SOF and attack operations elements to deny launch points/areas or preempt enemy asymmetric aerial attacks. The AAMDC will use enemy templates, terrain tools, and intelligence from multiple sources to develop the IPB to support deliberate and time sensitive targeting. The AAMDC will use fused sensor data to identify the location of potential enemy firing points and supporting infrastructure and to monitor the movement of platforms and activity in launch locations. The AAMDC, enabled by a netted and distributed C4ISR network, will collaboratively develop targeting data with Joint and multinational C4 elements. Target nominations will be transmitted over the C4 network to strike elements for immediate or preplanned execution. A modular AAMDC attack operations cell will typically co-locate with the CFACC. Should missile launches occur, Joint and Army Space and AMD sensors will support the determination of launch points based on the trajectories of the missiles. Army AMD depends on joint fires, joint air, and SOF for AMD-related attack operations.

*Active Defense Operations***.** The AAMDC will plan and coordinate a layered multi-tiered, extended-range defense, synchronized with offensive operations, to protect designated APODs and SPODs, critical bases of operation, assembly areas, fixed or semi-fixed C2 facilities, key logistics facilities, and coalition geo-political targets. This layered multi-tiered defense will utilize the air, land, sea, and space assets of AMD and Joint and multinational forces to surveil the battlespace, and exchange integrated fire control data via near real-time sensor-to-shooter linkages. Joint layered active defense is critical because it aggregates high probability of kill engagements to achieve near leak proof defenses required against enemies potentially with WMD capability. AMD forces will be capable of executing cooperative engagements leveraging the sensors of one service with the shooters of another as required. Theater AMD TFs must be capable of overmatching Medium Range BMs (MRBMs), TBMs, CMs, and, when and where required, RAM. While Army AMD retains capability against fixed wing

aircraft, Army AMD depends on joint air to take on the manned, fixed wing threat so it can better concentrate on aymmetric air and missile threats and relies on joint boost phase kills to help attrit long range missiles during ascent.

Theater level Army AMD formations will be linked to the Joint ID, engagement, and airspace control authorities and will be trained and certified to execute active defense fires in accordance with Joint rules of engagement (ROE), while commanding and controlling dispersed TFs , typically spread across multiple countries. Theater-level active defense operations will be integrated with both the Global Missile Defense efforts outside of the JFC's JOA and tactical AMD operations in support of UEx, UA, and Joint maneuver commanders .

Passive Defense Operations. To support passive defense operations, the AAMDC will disseminate air defense warnings to allow forces to implement protective measures to reduce the potential effects from air and missile attacks. The AAMDC and subordinate theater AMD formations will also provide timely, focused early warning of WMD/E strikes to forces at risk to allow units to initiate appropriate nuclear, biological and chemical protection measures. The AAMDC will enhance overall AMD defenses by planning, coordinating and synchronizing AMD-related force deception, camouflage and concealment, hardening, mobility, dispersion, redundancy, recovery, and reconstitution operations.

AMD C4I. AMD Battle Command will start with the strategic purpose in mind, employ a knowledge-enhanced, effects-based approach, and will use mission orders throughout the chain of command. AMD C4 is linked to the supported commander for operations[21] and to the Joint ID, engagement, and airspace control

[21] Force Operations include the actions and functions required to plan, coordinate, prepare for, and sustain the total air defense mission. (Air and Missile Defense Planning and Control System (AMDPCS) User Functional Description (UFD) , 1November 2001).

authorities for engagements. [22]. AMD engagement operations are complex and involve time critical decisions requiring extensive skill and knowledge of Joint interoperability and operations. AMD C4 within the Joint and multinational netted and distributed architecture will enable units to use continuously tailored third dimension SU to collaboratively plan, prepare, execute and assess all aspects of AMD theater-level warfighting operations. AMD C4 will track blue forces and provide near real-time positive identification of all aerial objects and ground threats, thereby enabling Joint and multinational forces to become more preemptive and proactive, destroying only hostile aerial threats, protecting friendly aircraft, and reducing vulnerability to the effects of WMD/E threats. The AAMDC Commander serves as the Deputy Area Air Defense Commander (DAADC) and integrates JTAMD/contributes to integration of operational force protection for the CFLCC/JFC. The Theater AMD Brigade Mobile Command Group (MCG) and subordinate Theater AMD TFs leverage common C2 to create multi-functional TFs and fight the dispersed AMD TF fights, typically in multiple countries, at UEy, JTAMD level.

Contribute to Third Dimension SA/SU. Army AMD will contribute to third dimensional situational awareness and understanding through extended range surveillance/fire control, focused early warning, and Joint connectivity. Deployed AMD ground-based and elevated sensors will conduct surveillance at extended ranges and fill the gaps at critical locations within the battlespace to ensure a complete vertical and horizontal picture.

To support early warning, UE AMD sensors, and UE AMD linkages to Joint and multinational sensors, will detect air and missile attacks and will transmit information to C4 elements. C4 elements will fuse the data and disseminate focused early warnings (and "all clear") only to at-risk forces.

[22] Engagement Operations consist of those functions required to execute the air battle. This includes establishing an air picture, determining the classification (identity) of all tracks, evaluating the threat these tracks pose to the firing units and other assets, and exercising engagement control over subordinate units. (AMDPCS UFD, 1 November 2001).

UE AMD sensors and C4 elements will collect, process, and disseminate near real-time information on the location, classification, ID, and activity of air and missile threats as well as selected ground threats in the battlespace that may not be detectable by other Joint or multinational sensors. These threats include: UAVs; low-flying terrain-obscured CMs; BMs;, tactical air-to-surface missiles (ASMs), including those with loitering capability; helicopters; RAM (and their launch platforms); and a variety of ground targets, including missile launchers and their supporting infrastructure. AMD sensors will also be capable of discriminating warheads from fragments, decoys, penetration aids, and other countermeasures.

Organic and external sensor data will be fused to create a scaleable and filterable SIAP. The SIAP will provide the third dimension input to the common operational picture (COP), which will provide force-wide visibility of friendly and enemy aerial objects. The SIAP will consist of common, continuous, and unambiguous tracks of detected airborne objects in the surveillance area. Each object within the SIAP will have one, and only one, track number and set of associated characteristics. Information available via the SIAP will facilitate combat ID by accurately and positively identifying aerial objects as friend, hostile, or neutral.

Commanders and staffs can utilize the three-dimensional COP to analyze and comprehend the air-ground situation, and to help determine likely information gaps, potential enemy options or actions, opportunities for friendly actions, and the effects of the environment on friendly and enemy actions. They will continuously develop aerial IPB to locate enemy air and missile infrastructure and activity on the ground to support offensive operations.

Contribute to Airspace Management. Army AMD will contribute to a more responsive and enabling airspace management solution and, in doing so, will help the Maneuver UA, functional and multi-functional UAs, and UE echelons to exploit the third dimensional battlespace to act first and finish decisively. UE AMD will provide the Army's link to

the Joint ID, engagement, and airspace control authorities and will provide the expertise for Joint Integrated Air Defense System (JIADS)-compliant surface-to-air fires. UE Airspace Management will be a Joint venture and will include the capability to manage an airspace control subsector that directly supports the Maneuver UA's network-enabled, airspace management vision while working harmoniously with the Joint Force Air Component Commander (JFACC) Combined Air Operations Center (CAOC). UE airspace management will directly support the ground force commander in a way that enables his fires and exploitation of airspace, protects friends, and complies with Joint rules and procedures for positive control of Joint airspace.

The capability to control a Joint airspace control subsector for UE Commanders will likely be an expanded, dedicated USAF Air Support Operations Center (ASOC) that will include Joint controllers, Army Aviation air traffic control crews, ADAM crews and Air and Missile Defense Fires Coordination Officer (AMDFCO) crews performing duties as part of the JIADS. The UE will also have modular airspace management capabilities that can augment maneuver or multifunctional UAs. Details of the UE airspace management construct are being worked as part of the Unit of Employment O&O and Joint discussions; however, it is clear that Army Aviation, Fires, AMD, and other Joint airspace users will all contribute to this Joint and combined arms solution.[23] (Annex G)

Integrating/Contributing to Operational Force Protection. Operational force protection includes all actions taken to counter the enemy's forces by making friendly forces, systems and operational facilities difficult to locate, strike or destroy.[24] Ultimately *operational force protection* conserves the force's fighting potential so that it can be applied at the decisive time and place. The functional tasks that comprise theater level o*perational force protection* include theater air and missile defense, NBC defense, high-

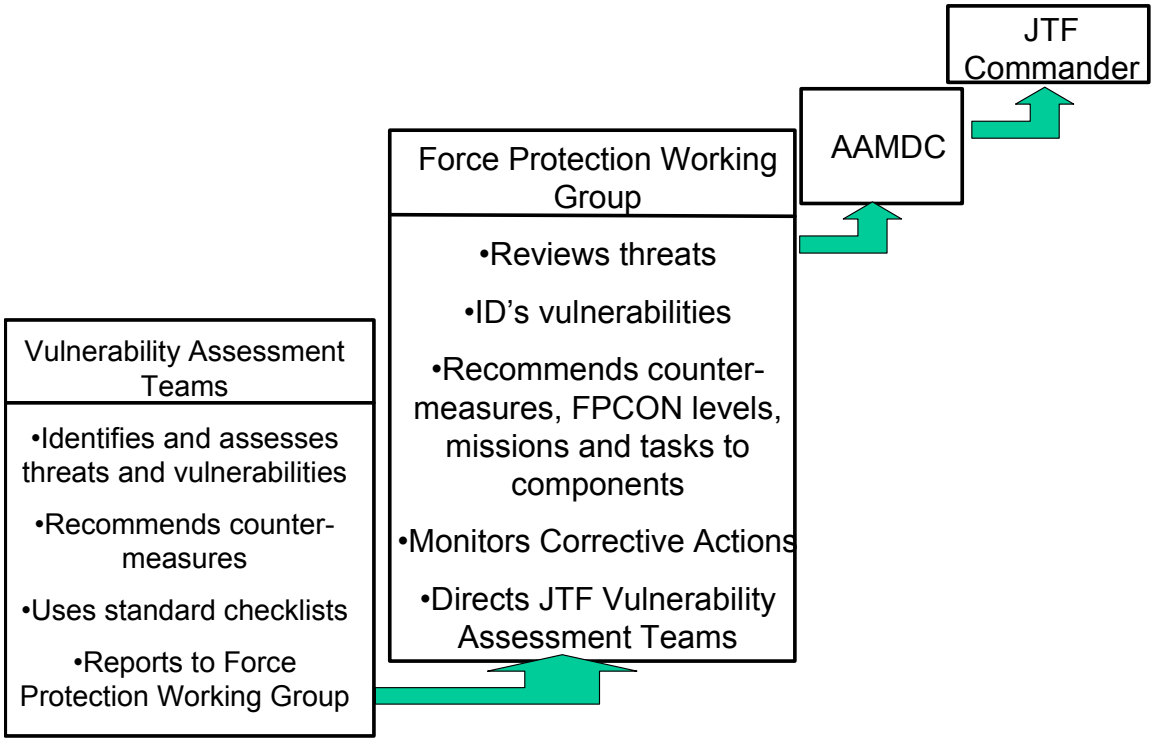
[23] The Combined Arms Center (CAC) at Ft Leavenworth is the proponent for UE airspace management and linkage to Joint. USAADASCH, assisted by Ft Sill, Ft Rucker, CAC, UAMBL, and others authored the UA's airspace management concept and are leading implementation efforts with the Future Combat System effort. The UE concept will complement the UA's more network-enabled approach and execution as envisioned.

[24] CJCSM 3500.04C, Universal Joint Task List, 1 July 2002, pg. B-C-C-130.

value asset (HVA) protection, route security, physical security, operations security, defensive information operations, anti-terrorism operations, and food and water security.

During OIF, the AAMDC, augmented with Military Police, Chemical and other key expertise, served as the single point of contact integrating theater level operational force protection efforts. The AAMDC recommended operational force protection priorities to the CJFLCC, led the JRA Operational Force Protection Board, oversaw vulnerability assessments of JRA priorities, recommended protection measures needed to optimize the JIM force's protection stance, and monitored execution of these measures.

Integration of Operational Protection (OIF)



If a Theater Protection headquarters is approved at UEy level,[25] the AAMDC and AMD forces will likely be a key contributor given that the AMD mission capability element is central to attainment of all three Joint Protection Mission Capability Areas and to the

[25] Predecisional

Detect, Assess, Warn, and Defend activities that are central to the Protection Joint Functional Concept. There are a number of other important contributors to operational force protection, including other combat arms units, Military Police, Chemical Corps, Engineer survivability capabilities, health care, computer network defense specialists, counter-intelligence and counter-terrorism experts.

Summary. The following figure summarizes the interdependent Joint ends, ways and means for Operational Level AMD in support of the UEy and JTAMD fight.[26]

AMD in Support of Operational Level

AMD Effects-Based Intent (Ends)	AMD Required Capabilities (Ways)	JIM Contributions needed (Means)	Army Contributions (Means)
PROVIDE AIR AND MISSILE DEFENSE			
• Regional allies ***assured***/ basing options ***unaffected*** by missile threats • Asymmetric aerial attacks ***deterred, preempted or defeated*** • Projection/sustainment of forces in anti-access environment ***unimpeded***	• AMD FDO for deterrence • Joint Layered active defense ➢Kill in ascent ➢Kill at terminal range vs MRBMs, SRBMs, CMs, LCRs • Attack Operations ➢Kill on ground ➢Launch point denial • Passive Defensel	• Joint Air, Fires • ABL • Aegis TMD	Mission Tailored Theater AMD Task Force(s) with Common AMD C2 (DCP) Capable of integrating IFC to any amount/ combination of AMD battle elements
CONTRIBUTE TO 3D SITUATIONAL AWARENESS/UNDERSTANDING			
GCC's 3D SA/SU/ISR ***enhanced***	• IPB, focused ISR • Aerial sensors and Joint ISR	AWACS	Linkage with SIAP, Joint ID & engagement authority
CONTRIBUTE TO AIRSPACE MANAGEMENT			
Enabling fires & Airspace use	Airspace management	CAOC	UE Tactical Air Operations Center for Joint airspace management
INTEGRATE & CONTRIBUTE TO OPERATIONAL PROTECTION			
• Attacks on critical bases in AOR **deterred or defeated** by Operational Protection stance • Critical bases **protected**	Integrate OP stance in JRA	JT contributions to SPOD, APOD, JRA security	AAMDC/TPC to integrate TAMD Pillars, JRA operational protection

3-2.3 Tactical Level: Army AMD in Support of the UEx and UA fights. Mobile AMD operations will be conducted to support Joint and multinational expeditionary forces and ground force commanders engaged in all phases of tactical operations.

[26] In the JTAMD fight, Army AMD will rely on the USAF, USN and USMC aircraft to counter any enemy fixed wing aircraft, allowing Army AMD to focus on asymmetric air and missile threats. Army AMD will rely on USAF and USN for countering ballistic missiles in boost and ascent phases. Army AMD will leverage Joint sensors for SA/SU and integrated fire control engagements including Engage-on-Remote and Forward Pass engagements.

935

936 **3-2.3.1 AMD Effects-Based Intent.** The effects-based intent of AMD in support of
937 tactical entry operations will be to ensure vertical, horizontal and littoral entry operations
938 are unimpeded by aerial RSTA or attack options. During all phases, AMD effects based
939 intent will include protecting the force and critical assets; denying the enemy the ability
940 to "see first;" attriting enemy missiles, rockets, and launchers on the ground; denying the
941 enemy launch options; preempting or preventing enemy aerial shaping operations from
942 impacting friendly execution of decisive operations; enabling the tactical commander's
943 use of airspace; and ensuring generation of decisive combat power is unimpeded.

944

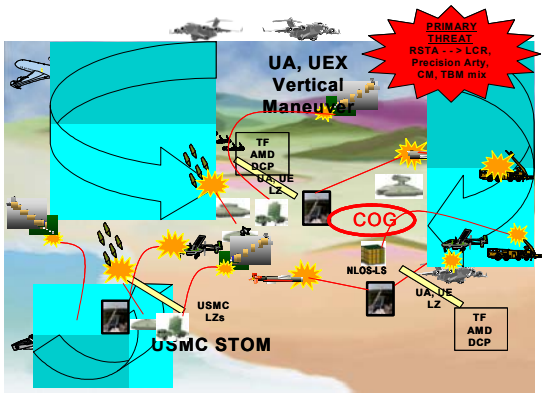
945 **3-2.3.2 Army AMD Concept of Operations.** Army AMD will employ tailored mobile
946 AMD forces to support UEx and UA forces conducting tactical entry, shaping, decisive
947 and sustaining operations.

MOBILE AMD IN SUPPORT OF UEx, UA TACTICAL OPERATIONS

Task/Purpose: Provide mobile AMD and contribute to situational understanding, airspace management and operational force protection in order to defeat enemy air and missile attacks, protect UEx and UA forces and high value assets, enable freedom of maneuver and contribute to victory

Concept:
- Co-locate selected pooled AMD forces with UExs, UAs for cohesion, training & deployability
- Employ common C2 to enable JIADS integration and integrated fire control of scalable AMD batteries
- Employ mission-tailored AMD to protect entry forces from anti-access threats (CMs, UAVs, TBMs & RAM) and contribute to force protection stance
- Employ AMD plug and fight architecture to efficiently expand area coverage
- During follow-on operations, employ tailorable AMD to augment limited UA AMD capabilities, kill UAVs beyond standoff
- Contribute to situational understanding and airspace management, convoy escort/LOC security
- Destroy CMs & TBMs and allow UA to *see first*.

End State: Maneuver commander has the freedom to operate, critical assets are protected, anti-access aerial platforms destroyed, airspace is enabled, and sustainment capability is preserved



Requires:
- Co-location with UEx, UA forces for combined arms cohesion, training, deployability
- AMD leadership, common C2, integrated fire control and scalable batteries capable of mobile, 360 degree ATBM
- Standoff UAV kills, 360 degree CMD
- Active defense vs RAM, direct fire capability
- JIADS-compliant fire direction, early warning, SIAP linkage
- Ground, elevated sensors
- Rapid deployability & maneuverability commensurate with supported force

948

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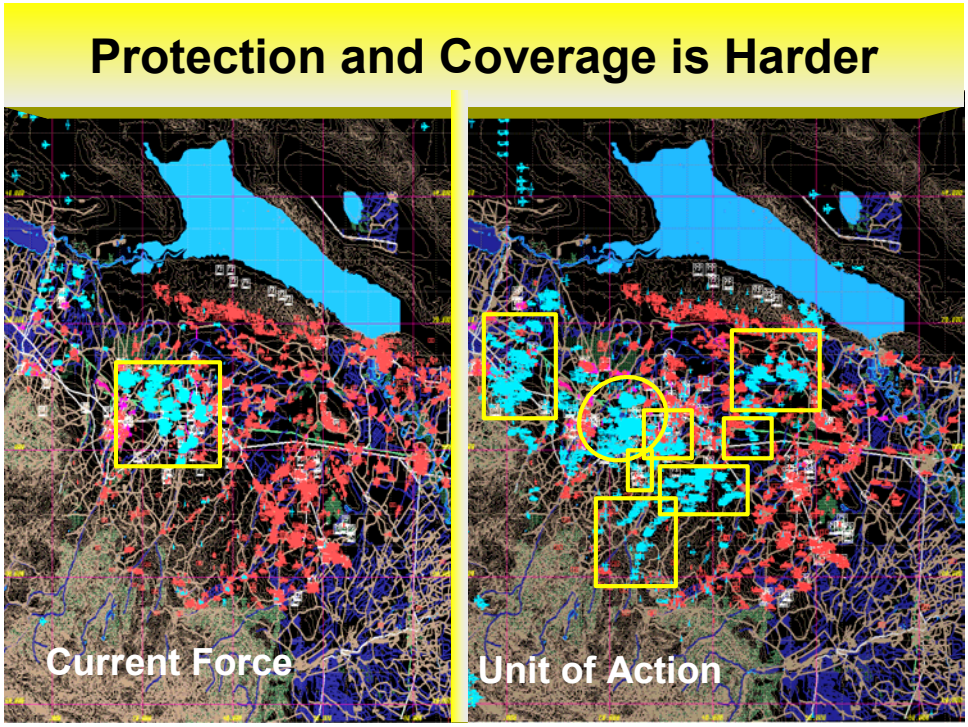
Tactical Entry Operations. AMD will deploy modular, scalable, multi-functional mobile AMD forces to support UEx DCPs and UAs engaged in vertical or horizontal entry operations and to augment USMC maneuver AMD capability during USMC "Ship-to-Objective-Maneuver" entry operations (STOM).[27] A mobile AMD DCP and appropriate number of scalable batteries will be inserted early in the flow with the vertical entry force to shield against the expected mix of asymmetric air, missile and RAM threats against the entry force. As required by METT-TC, AMD formations in support of UEx will be configured to destroy incoming TBMs, standoff UAVs, CMs, and RAM threats. Multi-functional AMD platforms may also support direct fire engagements by landing forces, contributing to force protection at the entry site during and after vertical entry. As the Maneuver UA and augmenting UEx forces disperse, mobile AMD forces will protect the follow-on flow through the vertical entry sites and, when required by METT-TC, will detach selected capabilities to augment Maneuver UA follow on operations. UE AMD modularity will allow sensor and shooter capabilities to be inserted or extracted as required to tailor the footprint to evolving mission requirements.

Tactical Level Shaping, Decisive, and Sustaining Operations. Modular AMD formations will deploy in support of UExs and UAs when and where required during shaping, decisive, and sustaining operations—before contact with the enemy, during contact, during the tactical assault, and during transitions[28]. Once the force has dispersed from the multiple unimproved entry points, the future AMD force "plug and fight" architecture reduces the frequency that entire AMD units will need to move to attain required expanded coverage. UE AMD formations will help shape the fight, nominating attack operations targets to kill on the ground and killing UAVs at extended ranges in order to deny surveillance and targeting of friendly force activities. UE AMD shooters

[27] USMC has CLAWS (SLAMRAAM); however, USMC needs augmentation for ATBM and active defense capabilities vs RAM. During JFCOM wargames, Army AMD augmented USMC AMD and leveraged common C2 to form a multi-functional joint TF. During USA vertical entry and STOM entry operations, the forces were consistently greeted with a combination of LCRs, TBMs, CMs, and UCAVs. The Mobile AMD TFs consistently defeated the threat.

[28] AMD actions that will enable the UExs and UAs to *See First*, *Understand First*, *Act first* and *Finish Decisively* before, during and after tactical assault are described in Annex E.

will engage and overmatch aerial threats that could impact friendly shaping efforts and preparations for decisive operations. UE mobile AMD forces will preempt or proactively defeat enemy attempts to observe or attack UE and UA decisive points and will protect decisive combat power. UE AMD will also ensure that critical sustainment operations continue unimpeded. UE mobile AMD formations will be capable of providing 360 degree fires and employing Joint integrated fire control capabilities (including remote launch and forward pass engagements). These capabilities will enable UE AMD to provide expansive area coverages needed to protect Maneuver UAs that are dispersed over large areas (one shown in the figure below) and selected UE critical assets in between multiple non-contiguous UAs.



Fighting the Four Mission Sets at Tactical Level.

Provide AMD.

Attack Operations. Army Future Force formations will have significantly enhanced ISR. UAVs, linked via networked fires to NLOS and BLOS fires and

Army and Joint attack aviation will have much greater range, precision, and lethality than current force tactical formations. As done with joint forces at the operational level, Army AMD planners will contribute to the aerial IPB to support offensive operations against air and missile threats and supporting infrastructure and contribute to time-sensitive targeting. Should missile launches occur, UA MMRs and UE AMD sensors will support the determination of launch points based on the trajectories of the missiles to enable both counterfire and active defense fires.

Active Defense Operations. Mission-tailored mobile AMD TFs will fight in support of UEx and, when and where required by METT-TC[29], will augment the Maneuver UA's limited Combined Arms for Air Defense (CAFADS) capability, destroying enemy UAVs beyond standoff ranges and overmatching the CM, TBM, and RAM threats. Mobile UE AMD typically fights in scalable, multi-functional AMD TFs that include modular mobile ATBM and long range CMD, stand-off UAV/cheaper cost per kill CMD, and active defense versus RAM/direct fire lethal effects capabilities. AMD modularity leverages scalable batteries, cohesive combinations of C2, sensors, and shooters that can achieve one or more of the required lethal effects. While these batteries will be able to operate independently with the Joint ID, engagement, and airspace control authority, they will usually be employed under the command and control of a mission–tailored mobile AMD task force.

Scalable mobile ATBM batteries will provide a 360-degree ATBM capability to shield the vertical entry force or critical assets and destroy CMs at long range. Although these batteries will be capable of performing missions with any

[29] The Future Combat System (FCS) Family of Systems Operational Requirements Document (ORD) lethality Key Performance Parameter states that the UA must overmatch threats in the FCS STAR, including UAVs, beyond standoff. The UA O&O and the FCS ORD also state that the UA depends on UE AMD augmentation anytime there are stressing aerial threats such as TBMs, CMs, high end UAVs, or incoming RAM. For more detail about AMD in the Maneuver UA, see the UA O&O.

appropriate number of launchers, and AMD task forces can accommodate one or more batteries[30]. Scalable Maneuver AMD batteries will destroy standoff UAVs, CMs, and RAM and provide direct fire multi-functionality. These batteries will be composed of platoon-size "battle elements" that can provide two-tiered protection. The "outer tier" battle elements will destroy UAVs beyond standoff and provide a lower cost kill against enemy CMs as part of the TF's area defense.[31] "Inner tier" battle elements will complement the UA, UE, and Joint/multinational force's superior precision attack and counterfire capabilities by providing active defenses against RAM. They will also have direct fire capability to provide self-defense and support maneuver force protection missions.

Passive Defense Operations The FCS-equipped Maneuver UA will have superior speed and passive defense characteristics compared to the current force. Despite these features, basic principles of passive defense will still apply - - particularly to fixed or semi-fixed C2, strike, and sustainment HVAs and activities. AMD will continue to contribute focused early warning to at risk forces and synchronize passive defense requirements with other AMD operational elements.

AMD C4I. AMD C4I operations will be executed by an AMD Regiment Mobile Command Group (MCG) and DCPs. The MCG will command and control AMD forces operating in support of UEx. The Regimental headquarters will command and control multiple, non-contiguous AMD TFs in support of higher tactical Commanders. The Regiment will provide ADFCOs to USAF command and control facilities to support Joint Integrated Air Defense System (JIADS) engagement operations. It provides maintenance and signal modules to support AMD TF fights. The MCG will enable the Commander to move where and

[30] More detail on the approved system that will provide this capability is available in the Organizational Concept Chapter.

[31](More detail on the future system that will provide these capabilities is available in the Future Combat Systems (FCS) Family of Systems Operational Requirements Document ((ORD) and the organizational concept chapter.)

when required to influence the battle without being tethered to a fixed command post.

The Regiment's DCPs will be commanded by AMD TF Commanders [32] The DCPs will have all the capabilities required to conduct parallel and collaborative planning and execute force and engagement operations based on mission orders received from UEx DCPs and/or supported maneuver, functional, and multifunctional UAs. The AMD DCPs will also have robust capabilities to integrate with the Joint ID, engagement and airspace management authority and provide JIADS-compliant tactical direction of UE AMD and any UA NLOS counter-air engagement operations. DCP integrated fire control will help select the right effects for the right targets.

Contribute to Third Dimension SU. ADAM Soldiers will be organic to the Combined Arms Battalions, Maneuver UAs, Protection UA CPs,[33] and UE DCPs. These Soldiers will have Joint collaborative planning and execution tools to help plan, monitor, and assess the battlefield situation for supported commands. In the UA's NLOS Battalion, six Multi-mission radar (MMR) crews will contribute aerial surveillance, counter-fire, and air traffic control information to the three dimensional COP. UE AMD forces will expand the third dimensional situational awareness and understanding through third dimension IPB, extended range surveillance/fire control, focused early warning, Joint connectivity, and professional AMD expertise.

UE Mobile AMD Soldiers will also contribute to third dimension SU by acting as observers to provide supplemental information on enemy locations and activities. AMD forces with superior optics, laser range finders, and other capabilities will be dispersed while performing AMD missions and, collectively, will make major contributions to the

[32] In garrison these TF Commanders will be composite Battalion Commanders initially. They could become Deputy Regimental Commanders, depending on Army decisions regarding if and when it will convert Corps/Divisions Commanders to UEx/Deputy Commanders.

[33] Predecisional

force when providing situation reports on observed activity at named areas of interest (NAIs) and calling for fire as part of the UA and UEx reconnaissance and surveillance and fires plans. Mobile AMD Regiment DCPs, with certified AMD crews, will provide the necessary linkage to the Joint ID, engagement, and airspace control authority and will have the expertise and situational understanding to request or make engagement decisions in accordance with Joint rules of engagement and procedures as authorized. They will also conduct operations planning, coordination, and execution with UEx DCP and Protection UA AMD cells and supported forces.

Contribute to Airspace Management: Army AMD will contribute to a more responsive and enabling airspace management solution and enable the Maneuver UA, functional and multi-functional UAs, and the UEx to exploit the third dimensional battlespace. UE AMD will provide provide the linkages and expertise for Joint Integrated Air Defense System (JIADS)-compliant surface-to-air fires. A detailed description of future airspace management functionality organic to the FCS-equipped Maneuver UA is at Annex ___.[34].

Integrate/Contribute to Operational Force Protection. The Mobile AMD Regiment, along with other multifunctional units will enable the UEx and UA commanders synchronize fires, maneuver, and protection. AMD forces may be task-organized with Military Police, Chemical, and Engineers to provide operational force protection. AMD multifunctional UE AMD elements with direct fire capabilities may also be tasked to protect convoys and active LOCs, vertical entry airfields, and other tactical assets.

Summary. The interdependent Joint ends, ways and means for Tactical level AMD in support of the UEx and UA warfight are summarized in the figure below.

[34] Also see Unit of Action Operational and Organizational Concept.

AMD in Support of Tactical Operations

AMD Effects-Based Intent (Ends)	AMD Required Capabilities (Ways)	JIM Contributions needed (Means)	Army Contributions (Means)
PROVIDE AIR AND MISSILE DEFENSE			
• UA/UE vertical entry; USMC STOM ***unimpeded*** by asymmetric aerial attacks • Generation & sustainment of combat power ***unimpeded*** • Incoming CM, TBM, LCR, RAM ***destroyed***	• Attack Operations • Operational Maneuver from strategic distances (OMFSD) • C130 deployable, mobile. 360 AD fires that overmatch ➢UAV beyond standoff ➢SRBM, CM ➢Incoming RAM	• Joint Air, Fires • Air & Sea lift into/intra theater • USMC SLAMRAAM (CLAWS)	• AMD Deploys Mobile, Modular tailored AMD TFs - MEPs early in flow • Army Fires, Air • SOF
CONTRIBUTE TO 3D SITUATIONAL AWARENESS/UNDERSTANDING			
Enemy aerial RSTA ***destroyed*** beyond standoff	Exploit SA/SU/ISR & Comms Relay	• AWACS • Joint, space ISR	• Elevated sensors, MMR • AMD counter-RSTA fires
CONTRIBUTE TO AIRSPACE MANAGEMENT			
TAC CDR's use of airspace, fires ***enabled***	• Provide trajectory clearance for grd-grd, grd-air, & air-grd fires • Fully IFC linked to Joint ID/Engagement Auth	• CAOC • UE / Joint Tactical Air Operation Center (TAOC) Airspace control sector	• Linkage to SIAP, Joint ID & Engage Auth • UA A2C2 network & leadership structure
INTEGRATE & CONTRIBUTE TO OPERATIONAL PROTECTION			
Active LOCS, convoys, HVAs, combat power ***unimpeded***	Task Organized Protection combat multipliers, passive defense	CAS	• PUA • Multi-functional AMD platforms in combat multiplier roles

Support of Transformation Planning Guidance (TPG) Operational Goals. The following chart summarizes the impact of the AMD transformation concepts described earlier in this chapter on TPG Operational Goals.

Today's AMD	*Future AMD*
TPG Operational Goal #1: ***Protect Critical Bases of Operation***	
Ability to provide the Joint Force's only active defense versus Tactical Ballistic Missiles - - sectored protection vs SRBMs. Short range, ground-based AD fires vs non-stressing threats. No Global Missile Defense Capabilities vs ICBMs/IRBMs. No 360-degree CMD. No capabilities vs MRBMs, LCRs, precision artillery.	Global Missile Defense combined with scalable, modular, multi-functional AMD TFs, integrated with joint TAMO, capable of 360 degree overmatching effects against complete asymmetric threat set. ***Critical bases of operation protected at strategic, operational, and tactical levels***.
TPG Operational Goal #2: ***Project/Sustain US forces in Anti-access Environment***	
Maintenance-intensive single purpose ATBM systems requiring large amounts of C5/C17 airframes and sea lift to deploy. Provides deterrence and defensive capability vs SRBMs to enable, politically and militarily, use of regional bases that are threatened by enemy missiles. Mobile AD systems have limited range and lethality and are overmatched by standoff UAV and likely mix of anti-access threats.	Global Missile Defense, more deployable theater AMD TFs, and Modular, scalable, C130-deployable mission-tailored Mobile AMD task forces that can deploy directly to operational areas via vertical maneuver and provide multi-functional, 360 degree overmatch against the full range of asymmetric aerial threats (TBMs, CMs, UAVs, large caliber rockets, precision artillery). Significantly reduced strategic lift requirements and reduced footprint/ sustainment requirements. ***Global Missile Defense enables offensive options vs enemies who have WMD, long-range missiles. Operational Maneuver from Strategic Distances, USA/USMC vertical entry operations protected and enabled***
TPG Operational Goal #3: ***Deny Enemies Sanctuary***	
Ground-based sensors limited by terrain against the low altitude asymmetric aerial threat set. CMs can exploit sectored systems. Current short range AD force is overmatched by standoff UAVs, stressing targets. Limited ability to attack launch sites in urban terrain and restricted areas, No active defense capabilities vs incoming rockets, artillery, mortars.	Elevated sensors help deny enemy options to evade detection and enable friendly NLOS fires. Aggressive attack operations and launch point denial reduce enemy missile options. Scalable, modular, multi-functional AMD TFs, fully integrated with JIM offensive and defensive operations, overmatch enemy UAVs beyond standoff/deny enemy options for any combination of asymmetric air /missile attacks by dominating 3rd dimension at time/place of our choosing. ***AAMDC integration of operational protection focuses effort and denies enemy asymmetric attack options. AMD denies enemy sanctuary in 3rd dimension.***
TPG Operational Goal #6*: Leverage Information Technology for Joint C4ISR*	
Stovepiped air picture available only to those co-located with selected joint, AMD C2 nodes. TOC-centric controlling A2C2. Only 1 active AAMDC.	Multi-mission radars and elevated sensors contribute to SIAP. SIAP is part of 3D COP/available to all commanders. Airspace management is network-centric and enabling. AAMDCs are structured IAW 1-4-2-1 strategy. ***Joint COP is enabled***

Chapter 4. Organizational Concept

4-1. Organizational Foundation. AMD organizations will be structured to meet the needs of the National Military Strategy to support future JIM formations in garrison and war. The AMD organizational vision is fully nested with the modular Army Future Force vision. All forces are considered "pooled" and available to support any Future JIM headquarters with modular, scalable mission-tailored packages.

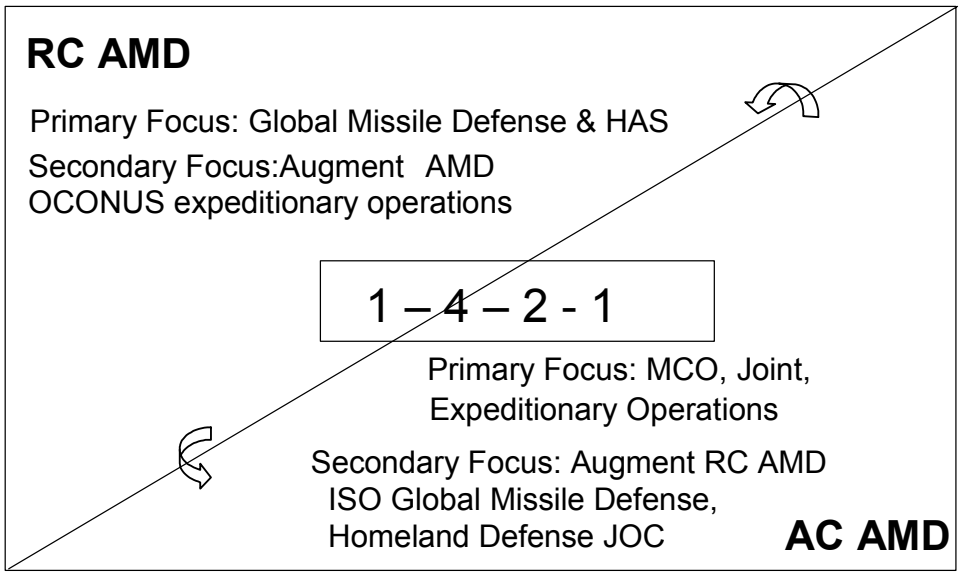
The AMD garrison stance will be synchronized with that of the foundation force. Appropriate AMD formations, along with other designated maneuver UAs, multi-functional UAs, and functional UAs from the overall force pool, will be located with UEx Commanders as a "foundation force" for training, cohesion, and deployability. This garrison stance will facilitate the timely deployment of tailored AMD capabilities in direct support to UAs or as part of mission tailored AMD formations in support of UE and JIM operations - - either with or without habitually associated forces. The timing and nature of AMD garrison stance transformation will be influenced by the insertion of future AMD capabilities and aligned with the pace and nature of the conversion of the supported force from current Divisions, Corps, and Army force structure to UEx Headquarters and DCPs, UEy Headquarters and DCPs, and maneuver, functional, and multi-functional UA structure.

Teamwork is required between active and reserve component forces to collectively meet the needs of the National Military Strategy. The garrison stance and wartime modularity AMD will achieve by the end of the UA increment 1 period (2010-2018) is based on current National Military Strategy, UE future force concept, and TF Modularity designs.
.

4-2. Leveraging the Total Army AMD Force to meet the Needs of the National Military Strategy. Army AMD transformation will optimize the synergy between the active component (AC) and reserve component (RC) forces in order to meet the requirements inherent in the Homeland Security, Strategic Deterrence, Stability Operations, and MCO JOCs, and achieve harmony between deployment timelines,

PERSTEMPO, resources, and recruiting and retainment realities. Army AMD cannot meet its JIM responsibilities without the combined contributions of the AC and RC AMD Team. The following diagram reflects the overall AMD strategy that will guide AC/RC force optimization:

Total Army AMD Teamwork ISO National Military Strategy



Homeland Defense and Global Missile Defense is an enduring mission and is the first element of the National Military Strategy. The Army National Guard (ARNG) has a rich history of protecting the Homeland with citizen-Soldiers as well as, along with the Army Reserves, making significant contributions to US military undertakings across the range of military operations. ARNG AMD will be trained and resourced to protect the Homeland as part of the Global Missile Defense and Joint and Interagency Homeland Air Security fights. ARNG AMD forces that are optimized for Homeland Air Security missions will be flexible to support Army AMD execution of other JOCs as requirements dictate and deployment timelines allow. Selected ARNG AMD battalions will be optimized to train and deploy critical capabilities such as launcher, elevated sensor, and AMDFCO crews to augment early deploying Army AMD formations in support MCOs and other JOCs. These ARNG AMD Battalions will have close training relationships

with AC AMD partner units. The garrison stance of ARNG elevated sensor units will consider state and interagency needs as well as applicability to the Homeland Security JOC. AC Army AMD units will be optimized to support the training and readiness requirements of Maneuver UA, Multi-functional UA, UEx, and UEy Commanders with emphasis on MCO. These modular, scalable, tailorable formations can augment ARNG AMD when required to contribute to ARNG AMD-led Global Missile Defense and Homeland Air Security efforts. Selected formations that have potentially equal applicability to Global Missile Defense and JTAMD efforts could be multi-component.

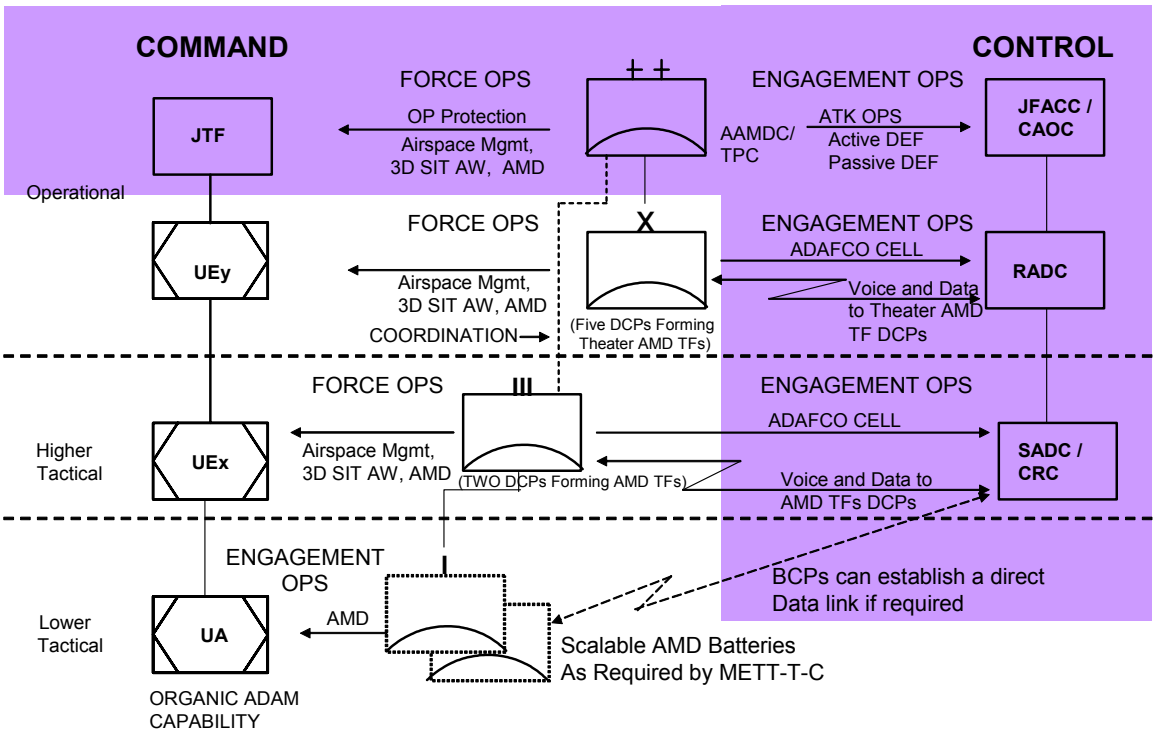
4.3 AMD Modularity. AMD formations will possess the capability to task-organize in support of all future force echelons – UE_Y, UE_X, and UA as the situation dictates. The following diagrams summarize the AMD modularity that will contribute to Army AMD operations.

AMD Modularity

- **Scalable Batteries -**
  - **Primary force building block**
  - **Cohesive combination of C2, sensors, and shooters that can achieve one or more required lethal effects**
- **UEx AMD Regiments, UEy Theater AMD Brigades**
  - **AMD Regiments-**
    - **Garrison: One per UEx Protection UA**
    - **Combat: Using Deployable Command Posts, deploys and fights in mission tailored Mobile AMD TFs**
  - **Theater AMD Brigade -**
    - **Garrison: One per SWA, NEA to conduct theater planning and coordination**
    - **Combat: Using Deployable Command Posts, deploys and fights in geographically dispersed mission tailored Theater AMD TFs**
- **AAMDC/Theater Protection Commands (TPC)**
  - **One active AAMDC/TPC per SWA, NEA; one RC for homeland defense**
  - **Integrates JRA operational protection and offensive/defensive JTAMD**

Expeditionary, Modular, Campaign Quality AMD Forces

Modular AMD Forces



The figure above shows the linkages between Army AMD, supported Army formations, and doctrinal Joint Integrated Air Defense System (JIADS) linkage.

The top portion of the figure below shows the future garrison stance of the pooled AMD force to support training and readiness to execute the operational concepts described in Chapter Three for simultaneous and overlapping AMD at strategic (Global Missile Defense, Homeland Air Security), Operational (UEy, JTAMD), and tactical level (UEx, UA) operations. The bottom portion shows typical mission-tailored warfighting capabilities that will fight at those levels.

	Strategic	**Operational**	**Higher Tactical**	**Tactical**
Garrison Stance	Global Air and Missile Defense Task Force (GAMDTF) AAMDC RC Ground Based Mid Course Defense (GMD) ARNG AMD Forces	AAMDC[35] Theater AMD Brigade[36]	Organic ADAM capability in UA HQ AMD Regiments[37]	Organic ADAM capability in UA & CAB HQs
Typical Warfighting Stance	GAMDTF, AAMDC GMD Unit AMD Brigade/BN[38] Tailored AMD TFs	AAMDCs AMD Brigade MCG Tailored Theater AMD TFs	AMD Regiment MCG Tailored Mobile AMD TFs	Tailored Augmentation from UE AMD per METT-TC

UE AMD forces are force pooled and flexible to respond to the needs of the Joint force at strategic, operational, and tactical levels and across the range of military operations with appropriate mission tailored packages. AMD forces will be habitually associated with each level, yet flexible to operate when and where required in support of the JIM and Army team.

[35] One per East, west UEy—likely as a key component of the UEy Theater Protection Command HQ.

[36] Ibid.

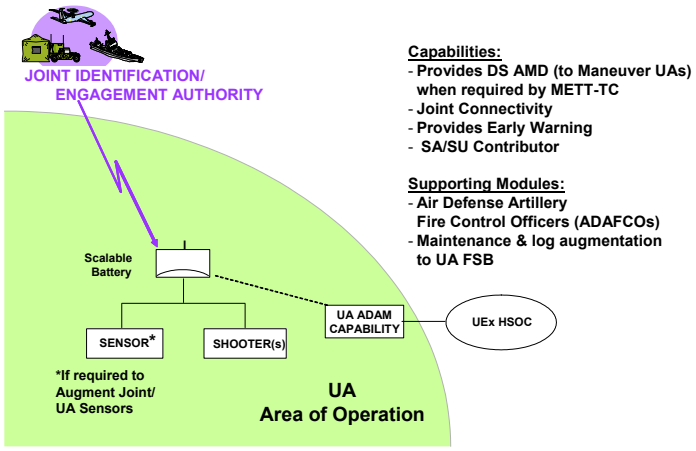
[37] Part of the foundation force for training and cohesion with UEx- -- possibly as part of a "Protection UA"

[38] C2 regions, cycle forces for HAS missions as required.

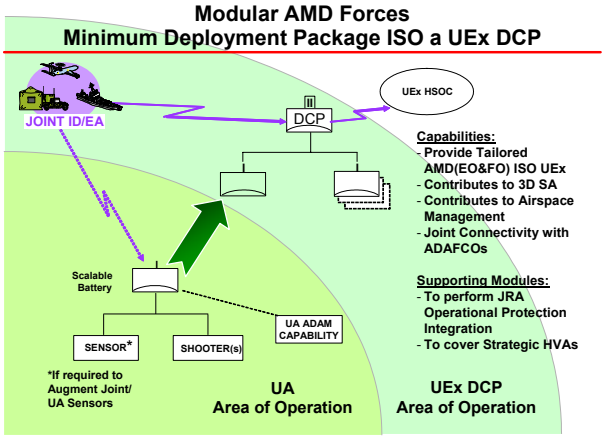
AMD forces are scalable, modular, and tailorable. While recent conflicts have resulted in the deployment of the majority of Army AMD units, we can reduce the deployment footprint considerably for short durations or as METT-TC allows. The following notional examples depict examples of minimal rapid deployment force modules that could be deployed in support of future Army formations and later added to as required based on METT-TC.

A notional minimum AMD module that could be deployed to support the maneuver UA Commander is shown in the figure below. This module could be expanded as required by METT-TC to augment the UA's limited AMD capability.

Minimum UA Deployment AMD

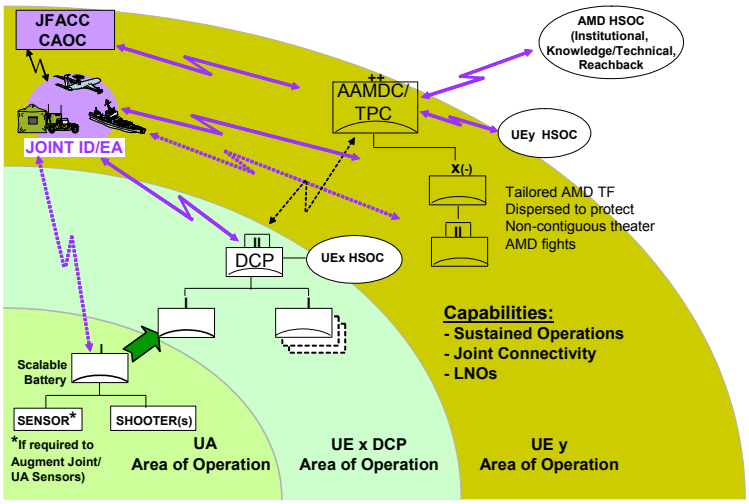


The figure below shows a minimum package that might be deployed with a UEx DCP..



The following diagram shows notional minimal modules and their relationship with UA, UEx, and UEy.

Minimum AMD Modules

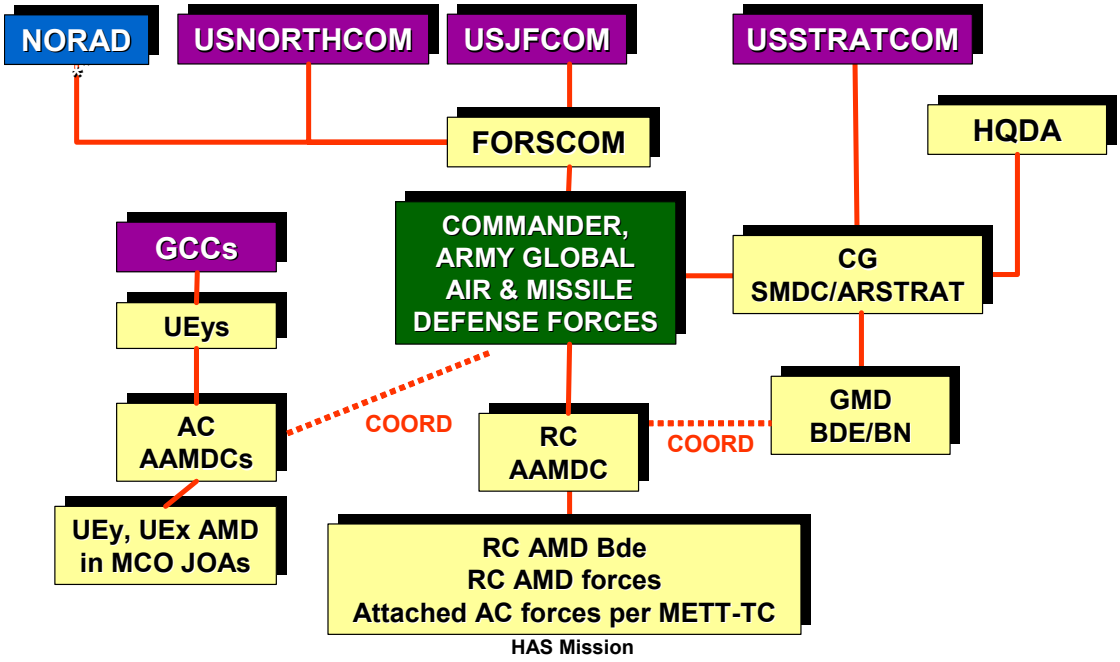


4-4. Global Missile Defense and Homeland Air Security.

Global Missile Defense and Homeland Air Security Higher Level Command. The Army Space and Missile Command (SMDC) is the Service Component Commander to STRATCOM. The Global AMD Force (GAMDF) will be a standing Joint headquarters organized and resourced to meet the unique command and control requirements of STRATCOM, NORTHCOM, and NORAD to integrate the Global Missile Defense and Homeland Air Security missions. A transformed reserve component AAMDC with Joint billets will provide command and control of assigned forces. Attached ARNG Brigade and Battalion headquarters will command and control multiple, dispersed Homeland Air Security AMD TFs. The GAMDF will coordinate with the AAMDCs assigned to the UEys as appropriate for synergy between global efforts and AAMDC efforts in JFCs JOAs.

1237

Strategic Level: Army AMD In Support Of Global Missile Defense and Homeland Air Security



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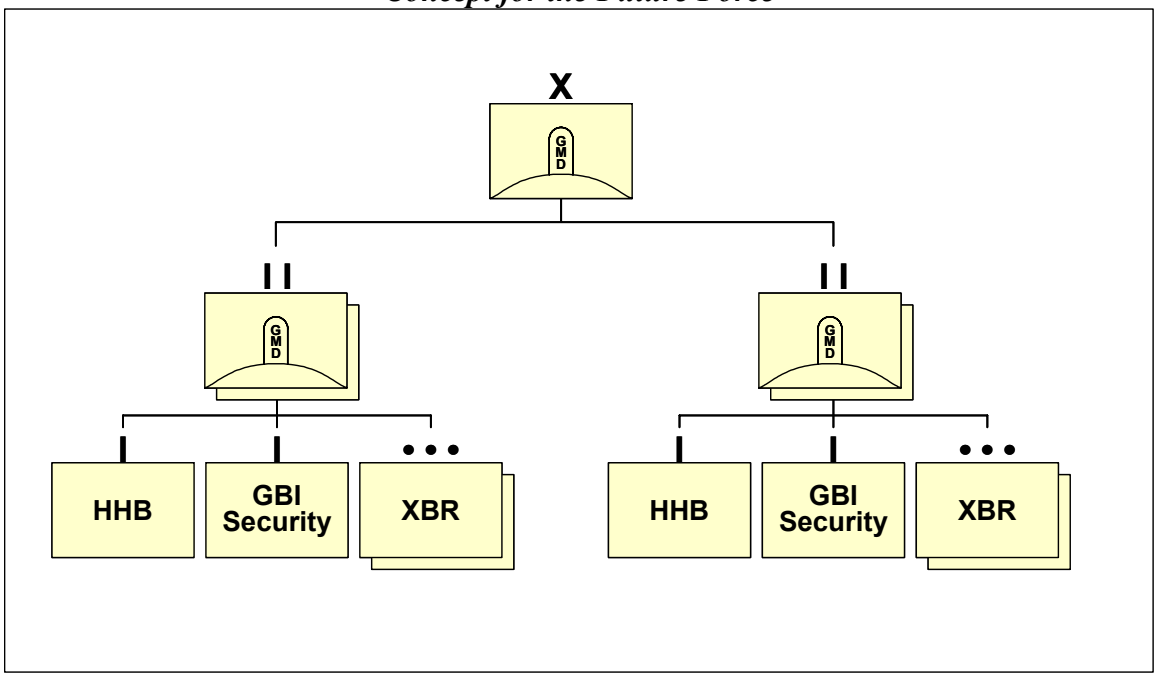
1239

1240 *Ground-based Midcourse Defense.* ARNG AMD Soldiers and Department of the Army
1241 civilians will man the Ground-Based Midcourse Defense. The Ground- Based Midcourse
1242 Defense Capability will be the bedrock of the active, layered defenses that will deter or
1243 defeat missile attacks. The design for the initial Ground-based Midcourse Defense
1244 capability is shown in the figure below. This organizational design will change as
1245 additional Ground-Based Midcourse Defense capabilities are added.

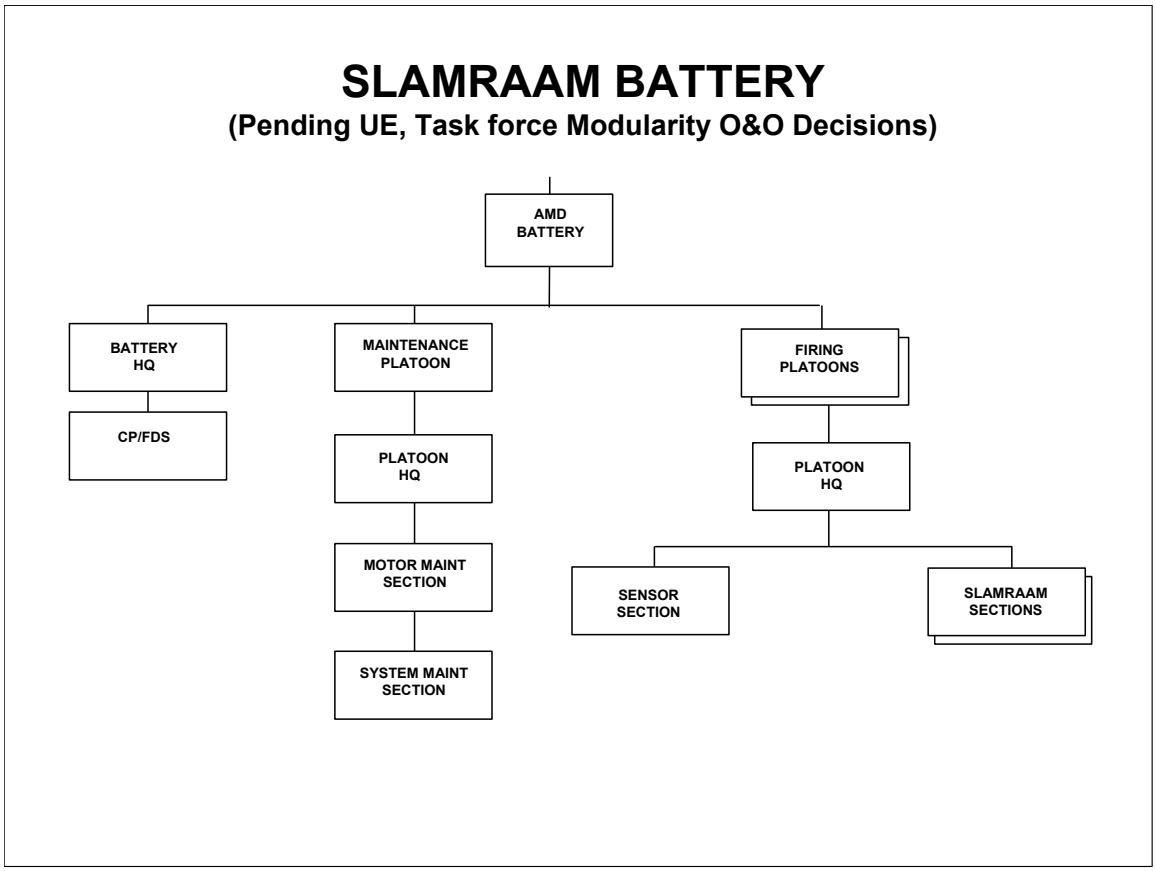
1246



Army AMD in Support of Global Missile Defense Missions Between the Homeland and the JFC's JOA. Geographic Combatant Commander (GCC) UEy Army AMD capabilities will contribute to Joint and multinational Global Missile Defense mission as requirements and joint staff prioritization between JOCs dictate.

Army AMD in support of Homeland Air Security Missions. In addition to manning the Ground-Based Midcourse Defense and the transformed RC AAMDC that supports Global Missile Defense and Homeland Air Security operations, ARNG AMD will provide tailored force packages (AMDTFs)to defend critical assets in the Homeland as part of Joint and Interagency task forces. ARNG AMD will be equipped and resourced to provide responsive support for recurring Homeland Air Security deterrence missions triggered by increases in the terrorist threat level. ARNG AMD units will have the capability to command and control non-contiguous task forces on a regional basis. Most ARNG AMD units will focus training and readiness on the Homeland Air Security mission; however, they will be sufficiently flexible to deploy across the range of military operations to support any element of the National Military Strategy. A defended asset list for Homeland Air Security may assist in sizing ARNG AMD forces to meet National Military Strategy and Homeland Defense JOC. Future ARNG AMD forces supporting

Homeland Air Security as a primary mission will be equipped with the Block 1 Enhanced Area Air Defense System (EAADS) capability - - Surface-launched AMRAAM (SLAMRAAM). The figure below depicts the SLAMRAAM organizational construct.



4.5 Army AMD that Habitually Trains and Fights at UEy/JTAMD Level.

AAMDCs. The AAMDC, will be the senior UEy Army AMD command and control (C2) headquarters in theater. During MCOs, the AAMDC Commander performs the role of senior Army AMD Commander, the theater air and missile defense coordinator (attack operations, active defense, passive defense and AMD C4), the Deputy Area Air Defense Commander (DAADC), and participates in the integration of Theater Operational Force Protection. The AAMDC ensures continuity of effort and momentum for AMD forces in theater and any required integration with Global Missile Defense outside the supported

JFC's JOA. It will support the needs of deployed forces consistent with the combatant commander's priorities and directives.

The two deployable UEy AAMDCs will be AC in anticipation of frequent, short notice overseas deployments in support of the National Military Strategy. They will have all required leadership, battlestaff, and capabilities and will have a regional focus (currently Southwest Asia (SWA), Northeast Asia (NEA)) These two AC AAMDCs are additive to, and structured differently from, the transformed RC AAMDC that will focus on defense of the continental United States.[39] The regionally focused AAMDCs will be positioned to support the UEy Commander. An AAMDC HSOC will serve as an institutional, industry, and knowledge-based center supplementing forward AAMDC command posts and UEy HSOC AMD staff with technical support, planning, and expertise. The alignment and habitual association of AAMDCs and associated theater AMD Brigade will be maintained as much as possible to enhance planning, training, leader development, and readiness. AAMDCs will focus upward and outward in peacetime on planning and coordination and will exercise routinely with pooled UE and Joint and multi-national AMD forces and other protection forces and enablers.

The UEy AAMDC headquarters will be organized to synchronize offensive and defensive AMD missions and contribute to the integration of operational force protection in a JIM environment. Each AAMDC CP will have an embedded modular EECP that, when not already forward deployed, can rapidly respond to contingencies. The UEy AAMDCs, augmented as required, will continue to integrate operational force protection as in OIF and, when UEy Theater Protection Commands are formed, will contribute to the Protection Joint Functional Concept.

UEy AMD Brigades and Theater AMD Task Forces. Both regionally-oriented UEy AMD Brigades draw from force pooled AMD assets consisting of Theater High Altitude Air Defense (THAAD), Medium Extended Air Defense (MEADS), EAADS, and Joint

[39] When national priorities dictate, AAMDCs can be deployed to other theaters.

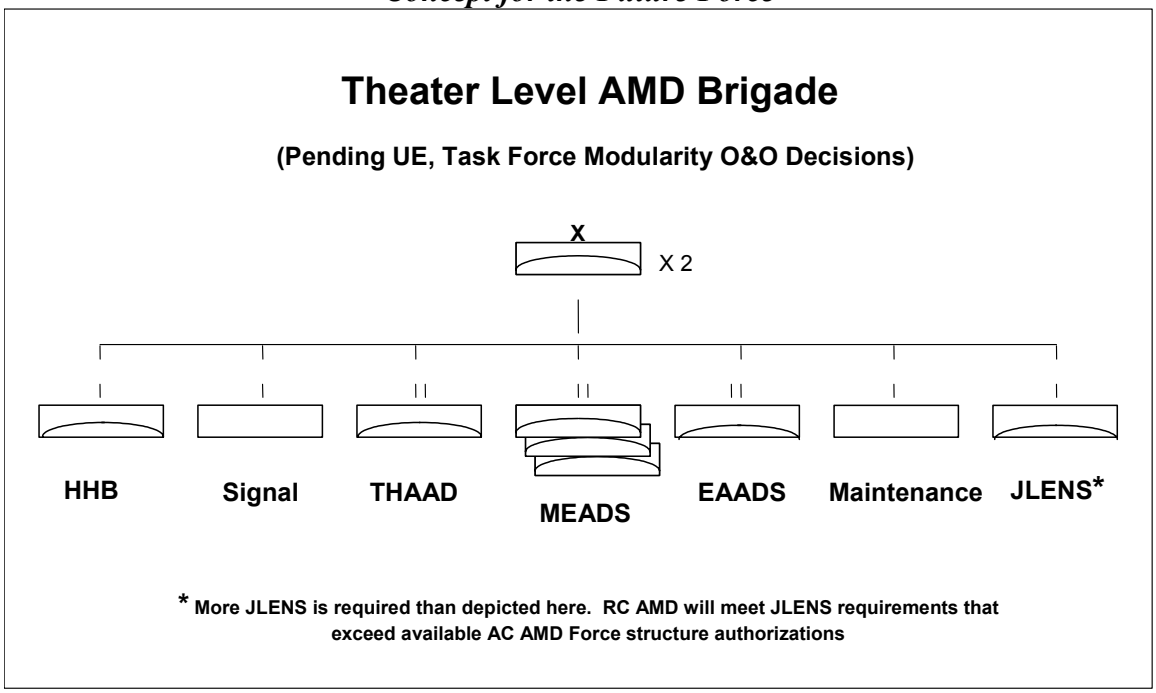
Land Attack Cruise Missile Elevated Netted Sensor (JLENS) units, along with required Headquarters Battery, and modular maintenance and signal units.

The Brigade headquarters and subordinate Battalions will be capable of deploying multiple AMD task forces providing integrated fire control to any combination or amount of scalable AMD Batteries under the wartime command and control of the Theater AAMDC. The Brigade could also provide Batteries to supplement the other Theater AMD fights, the AMD Regiments at UEx level, other Joint forces such as Air Force Air Expeditionary Force (AEF) Task Forces[40] or Marine STOM forces, or Global Missile Defense missions as required. The EAADS Battalion in the Theater AMD Brigade meets the USAF requirements for on call air defense support of AEF as part of the overall Joint and expeditionary mindset of the AMD future force, as well as being flexible to fight at any level across the range of military operations.[41]

The Theater AMD Brigade headquarters will provide multifunctional C2 for protection and other missions as required by the UEy Commander. Common C2 will enable each of the battalions assigned to the Theater AMD Brigade to act as a Theater AMD Task Force, able to fight any combination of the scalable batteries. Theater AMD Battalions will each have the robust staff required to fight as a widely dispersed AMD Task Force - - often in different countries. The Brigade will have a modular maintenance battalion and a modular signal company to support near term Brigade, Battalions (garrison) and Task Force (training, war) operations, but will migrate to a two-level maintenance system to support future operations as new capabilities allow. The Brigade will also have an elevated sensor battery.

[40] 2003 Army-arir Foce Warfighter Talks Task #9 Report, Air Combat Command, 30 Sep 2003 calls for dedicated Army AMD SLAMRAAM/EAADS as part of a Joint, expeditionary approach to Air Expeditionary TFs

[41] USAF/USA warfighter talks point number 9



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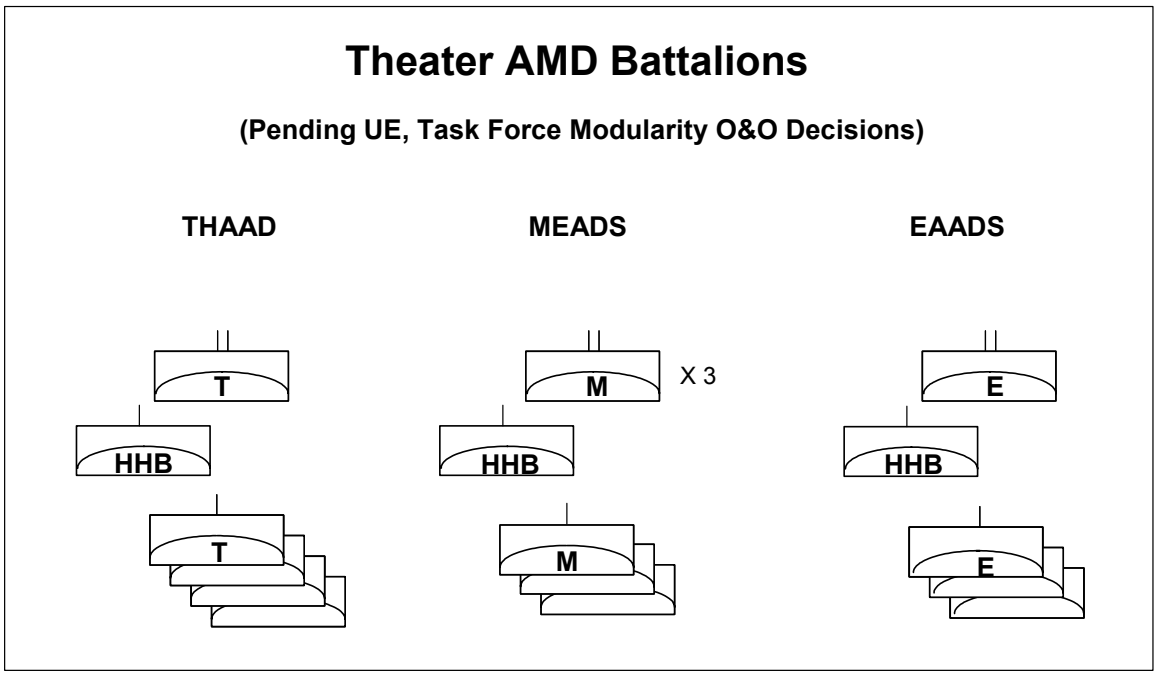
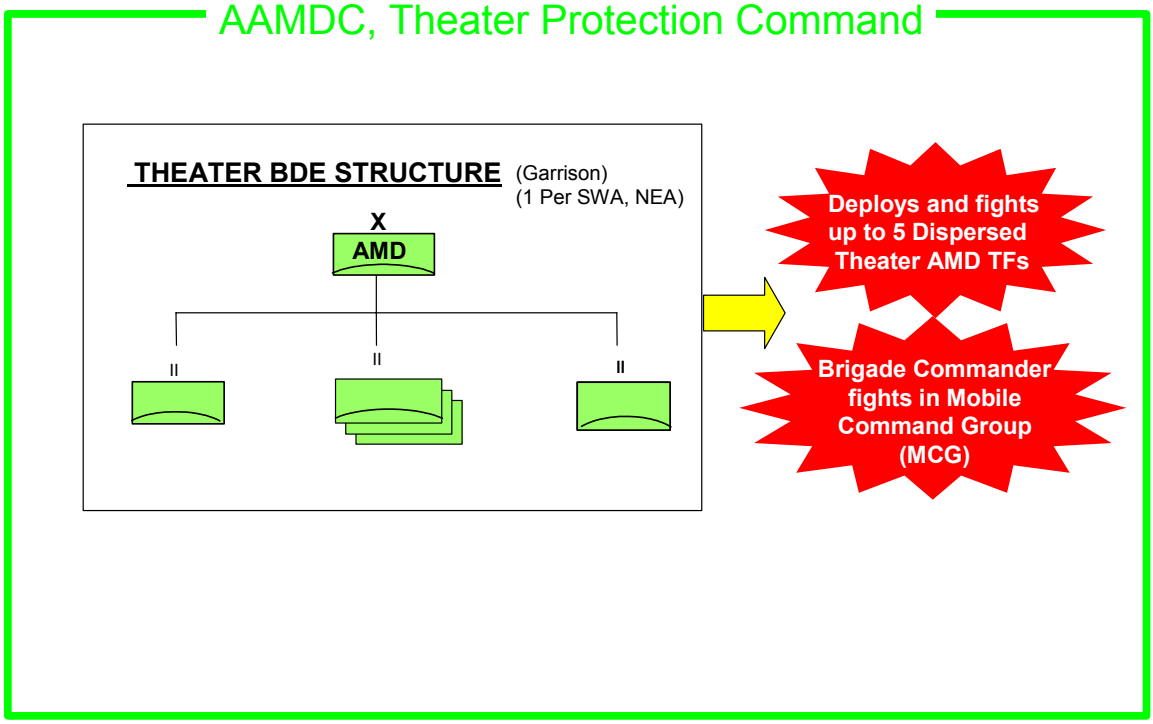


1337

1338 The following figure summarizes AMD Modularity at UEy.

1339

Operational: AMD MODULARITY at UEy

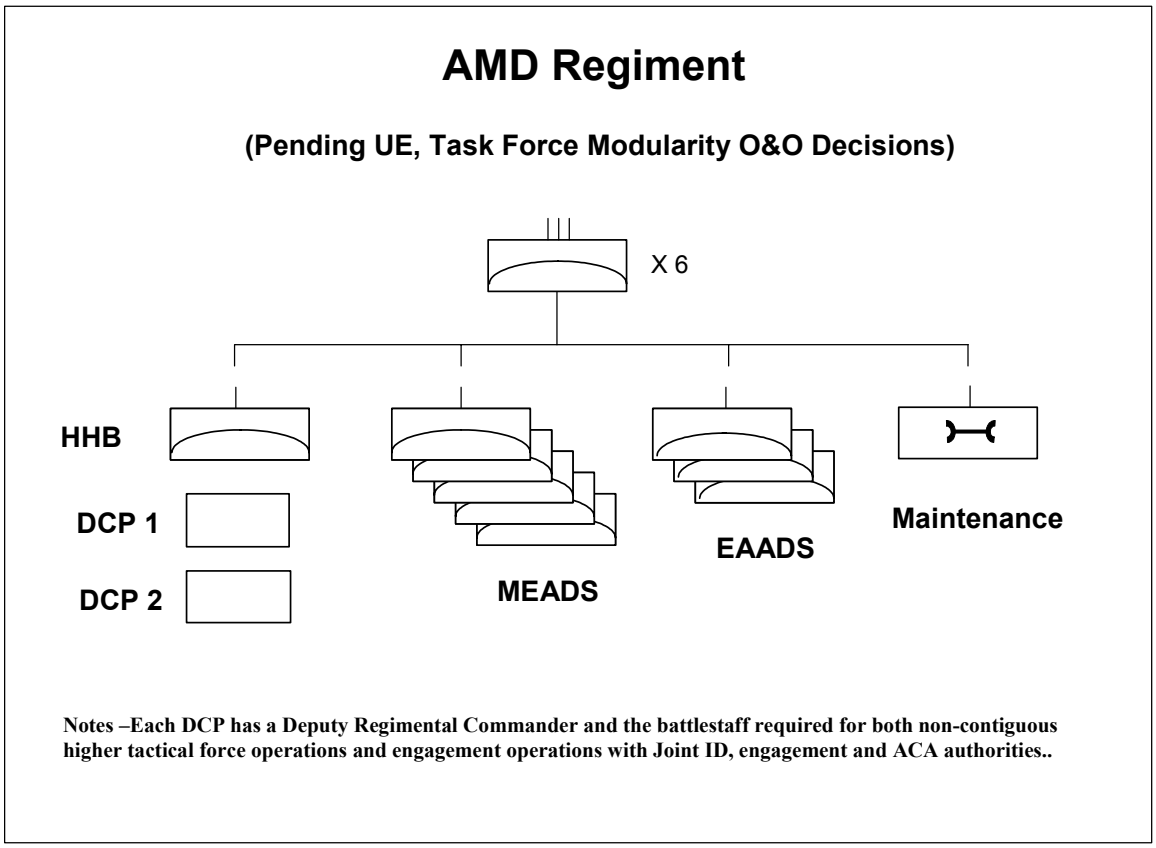


4-6 Pooled AMD that Habitually Trains and Fights at UEx level. AMD will support the tactical fight with scalable, modular, mission-tailored mobile AMDTFs.

The Mobile AMD Regiment. The AMD Regiment will be smaller and more mobile than the Theater AMD Brigade at UEy level. Organized at the higher tactical level, the AMD Regiment will focus on training, readiness, leader development, and Joint and combined arms integration of pooled AMD forces. AMD Regiments should be located with other members of the combined arms team likely to execute the UEx- AMD mission orders in combat as part of "foundation forces" to support training, cohesion, and deployability. The Regiment will execute UEx AMD mission orders in training and war and may be habitually associated with a Protection Unit of Action in garrison.[42] AMD Regiments

[42] The Protection Units of Action is pre-decisional. Protection UAs are envisioned to provide administrative higher headquarters support for Chem, MP, Eng, and AMD portions of the foundation force in garrison. The PUA will C2 mission-tailored forces for specific security missions assigned by UEx - - not necessarily the same forces as those associated in garrison.

will have scalable MEADS and EAADS Batteries as well as a Headquarters Battery and maintenance company. [43]The Regimental Headquarters will have a Mobile Command group and two Deployable Command Posts (DCPs). Each DCP will have a Deputy Commander with the requisite operations battlestaff needed to conduct parallel and collaborative planning with dispersed UEx DCPs and supporting UAs and to provide integration with the Joint identification, engagement, and airspace control authorities. The Regiment in peacetime will likely include 5 scalable MEADS Batteries and 3 scalable EAADS Batteries. In training and wartime, the DCPs can control any combination of capabilities. The DCP structure provides some flexibility for non-contiguous employment of a portion of the Regiment if UEx DCPs and foundation forces are dispersed in order to enable better combined arms training support, cohesion, and deployability. In the near term, Army AMD will convert Corps-level AMD Brigades/pure Battalions to Regiments with Composite Battalions. When Corps and Divisions Commanders change to UEx/Deputy Commanders, AMD Regiments will include Deputy Commanders. Composite Battalion/Deputy Regimental Commanders will be board selected commanders as their DCPs will provide TF level C2 in peacetime and war. The conceptual diagram for an AMD Regiment is shown below.

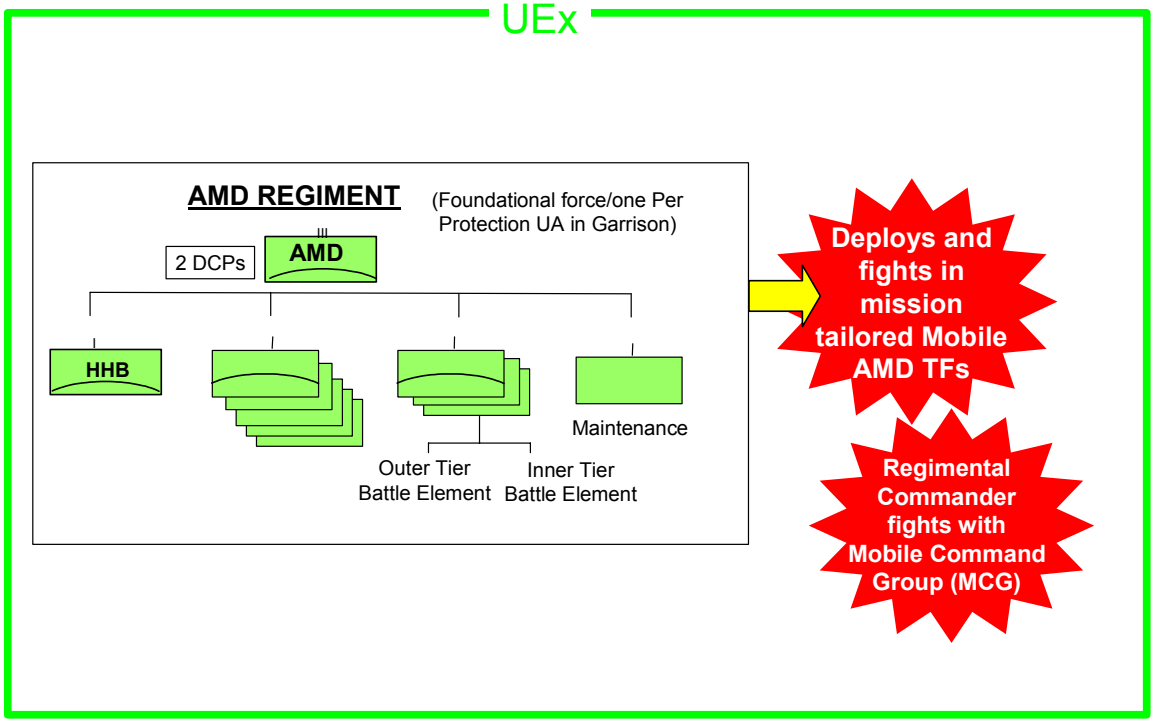


1370

1371 The following diagram summarizes UEx modularity.

1372

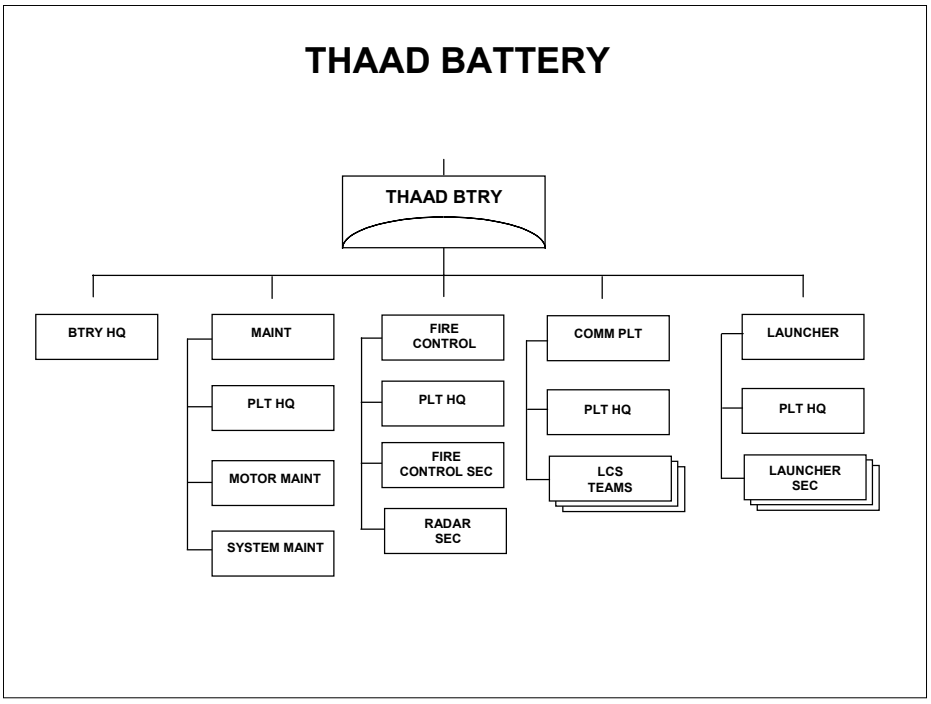
Tactical: AMD MODULARITY at UEx



4.7 Scalable AMD Batteries. The AMD batteries will be the primary battle elements to achieve effects on the battlefield at maneuver UA, UEx, UEy, or strategic level. They can fight independently but generally will serve as functional battle elements of the multifunctional AMD task forces. Batteries will be able to link to the UE AMD Task Force C2 or, secondarily connect directly into the authorized Joint identification, engagement, and airspace control authority. Batteries will have appropriate fire control and shooters to achieve the required battlefield effects and the battle command functionality to execute parallel and collaborative planning with the AMD Task Force and or the UAs they augment. Batteries are scalable - - they can fight with any appropriate numbers of launchers or sensors. The following diagrams depict the garrison composition of Future Force AMD batteries.

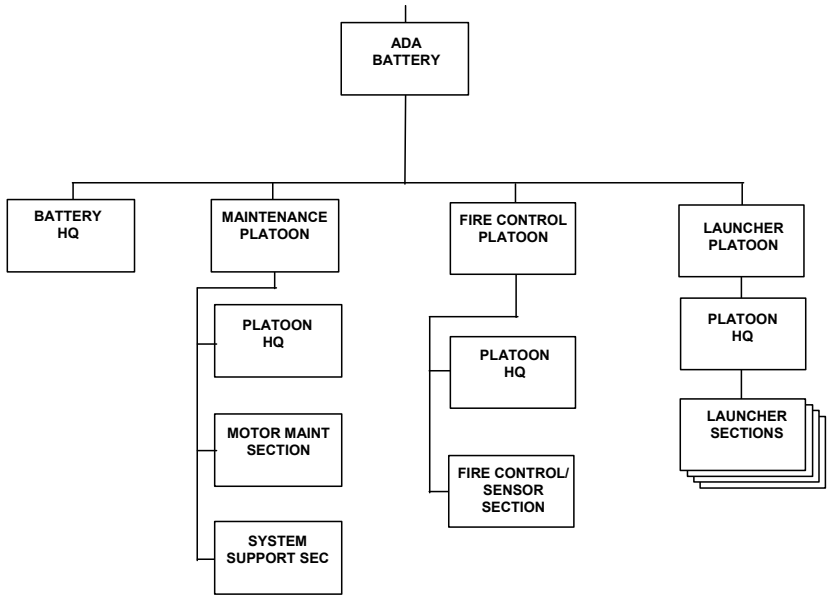
THAAD. THAAD Batteries will be employed by Theater AMD Brigades in support of the Joint Force Commander. The Joint Staff or GAMDF could conceivably direct

THAAD employment outside the JFC's AO to support Global Missile Defense operations.



MEADS. Scalable MEADS Batteries provide a more mobile, 360-degree ATBM capability to shield the vertical entry force or critical assets and can destoy CMs at long range, allowing preferential engagements over less critical areas. While scalable MEADS batteries can operate independently with the Joint ID and engagement authority, they will usually be employed under the command and control of an AMD TF DCP. MEADS batteries can perform missions with anywhere from one to twelve launchers as required and AMD TFs can accommodate one or multiple batteries.

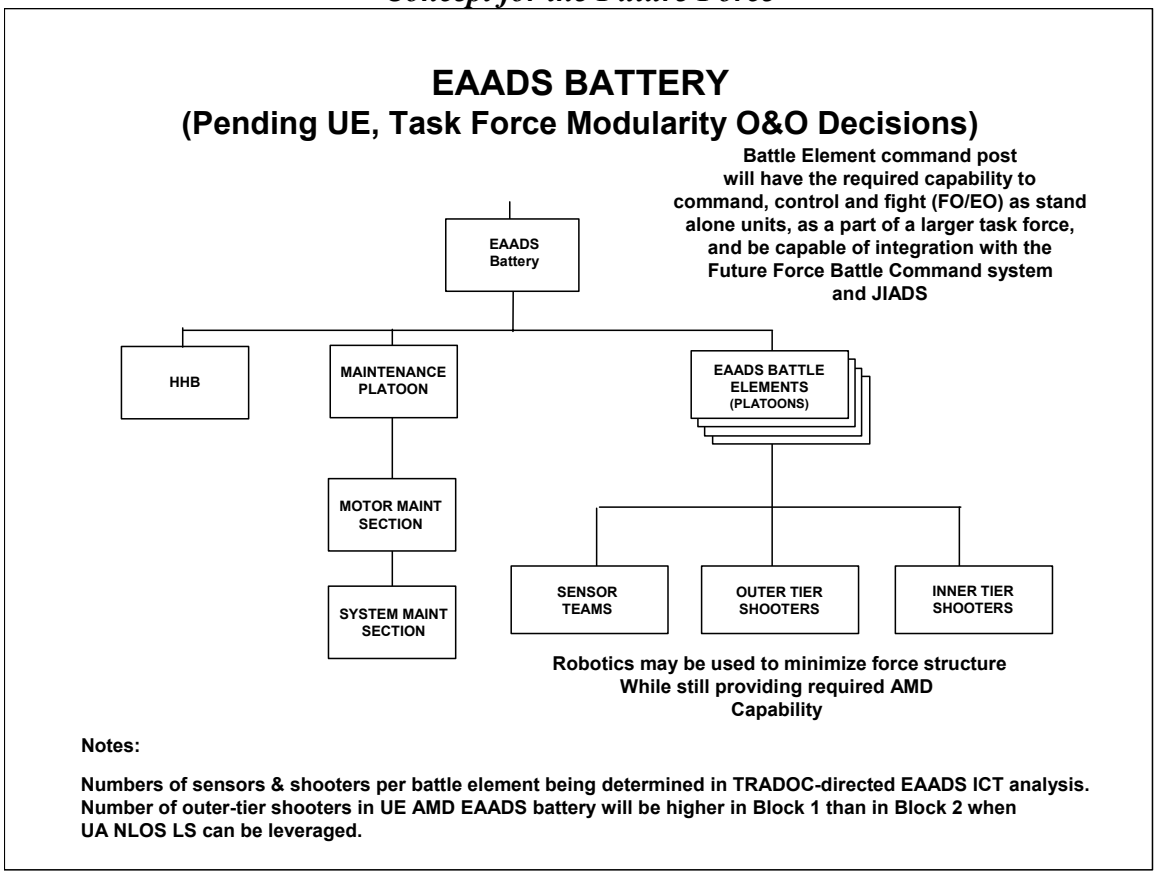
MEADS BATTERY
(Pending UE, Task force Modularity O&O Decisions)



MEADS launchers depicted may be split between active and reserve components.
MEADS launchers will be capable of firing PAC3 and other missiles.

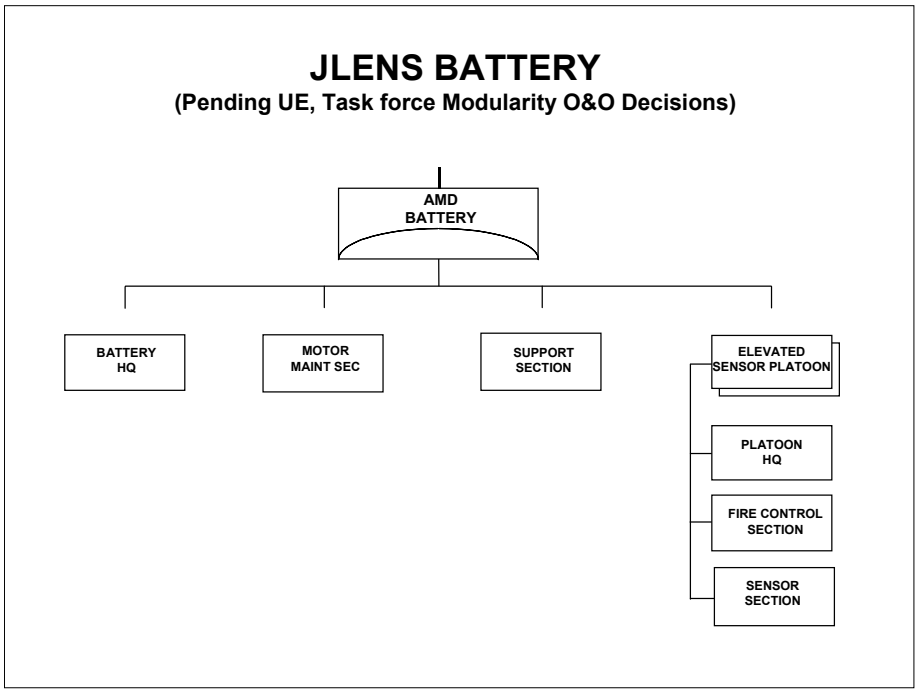
EAADS. Scalable EAADS Batteries will include outer tier and inner tier battle elements. Outer Tier Battle Elements destroy UAVs beyond standoff and provides a lower cost kill means against enemy CMs as part of the TF's area defense. The EAADS Block 1 outer tier system leverages SLAMRAAM, utilizing a tri-service missile. EAADS inner tier battle elements will complement the UA, UE, and JIM force's superior precision attack and counterfire capabilities by providing defenses against RAM. EAADS inner tier will also have direct fire capability for self-defense and multi-functionality. EAADS requirements and associated force structure are still in development. EAADS inner tier is not projected to be available until late in the FCS increment one period, therefore, in the near term (2007-2015) Battery structure will be exclusively dedicated to outer tier (SLAMRAAM) C2, sensors (Sentinel Enhanced Target Range and Classification [ETRAC]), and shooters.[44] The figure below depicts the envisioned end state for an EAADS Battery when all capabilities are fielded.

[44] See FCS ORD, 14 April 2003, for description of EAADS.



JLENS. JLENS will provide multi-functional elevated platform support for NLOS targeting, long-endurance communications relays, and ISR support. Future JLENS will provide maneuverable elevated platforms of varying sizes to meet unique battlefield requirements.[45]JLENS will be in both the active and reserve component to meet NMS requirements.

[45] See FCS ORD, 14 April 2003, for a description of JLENS.



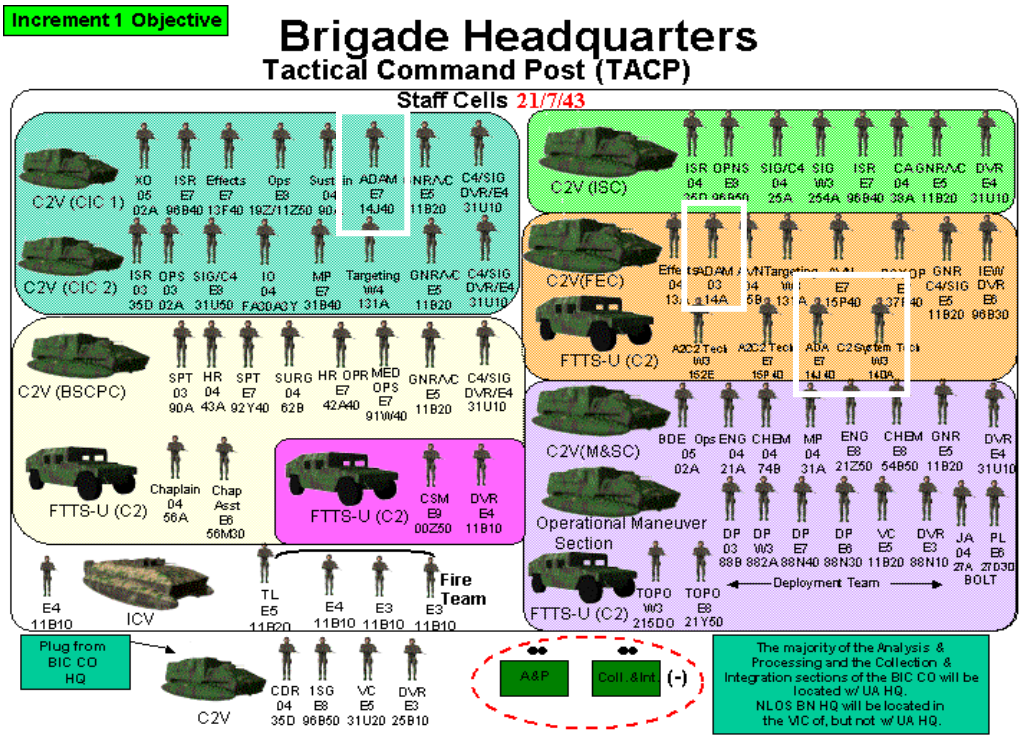
Army National Guard (ARNG) AMD units augmenting Theater Army AMD Brigades and Mobile AMD regiments. One or more selected ARNG AMD Battalion(s) will concentrate on preparing trained and ready launcher crews to support MEADS employment in MCOs. These forces will routinely participate in active component training exercises. Selected numbers of launchers will be maintained on a higher state of alert in order to provide rapid response. ARNG AMD will provide additional elevated sensor and AMDFCO crews to help meet mission requirements across the range of military operations. Current and projected AC AMD structure does not allow AC forces to meet anticipated UEy and JTAMD demands without ARNG augmentation in these capability areas.

4-8. AMD Staff Organic to UE, UA Headquarters and Maneuver UA MMR Crews

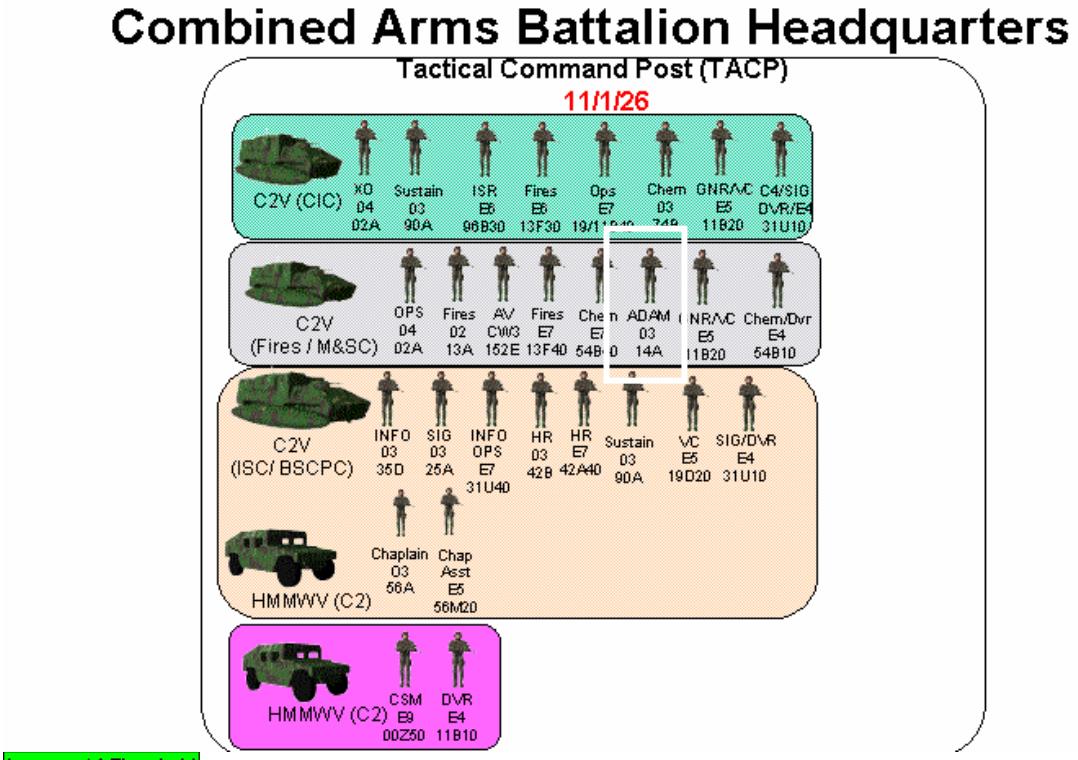
General. AMD staff members are assigned to provide organic AMD expertise to the UEy and UEx HSOC, DCPs, and to maneuver and selected multifunctional UAs. Their primary function will be to integrate air and missile defense planning for the battlestaff and contribute to planning relevant to the four AMD mission sets detailed in Chapter 3.

MMRs organic to the Maneuver UA will support situational awareness and understanding, counter-fire and active defense fires versus RAM threats.

AMD Structure Organic to the FCS-Equipped Maneuver UA. There will be seven multifunctional AMD Soldiers organic to the Maneuver UA leadership structure. An Air Defense Airspace Management (ADAM) Non-commissioned officer (NCO) is assigned to each Combined Arms Battalion. The UA headquarters will have both an ADAM officer and ADAM NCO. The Maneuver UA FEC will have an ADAM vehicle with and ADAM Tech and NCO as well as a forward air traffic control crew manned by Aviation Soldiers. Several other members of the UA Battlestaff will supplement UA AMD contributions to airspace management and protection planning. ADAM crewmembers will be trained in all aspects of planning, coordinating, and executing airspace management. They will also be trained to assist the UA with aerial IPB and planning and coordinating UE AMD augmentation and assisting with UE AMD execution and related UA attack operations, CAFADS, and AMD EW efforts. Additionally, AMD Soldiers will help provide the manning for the UA's six organic MMRs. The UA is almost always augmented by UE AMD forces. The following diagrams highlight organic AMD members of the UA staff and the UA's MMR Section.



Increment 1 Objective



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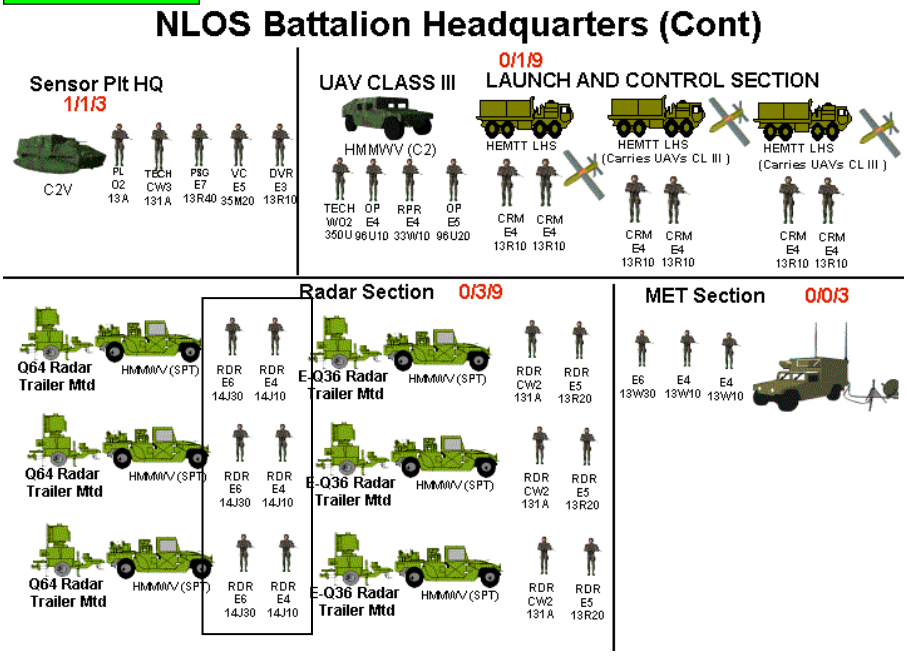
Increment 1 Threshold



1459

1460 Note – Sentinel ETRAC and Q36 will be used in lieu of MMR for at least the first three
1461 FCS Maneuver UAs equipped and manned by 14 series Soldiers. Once MMR is fielded,
1462 AMD and Field Artillery Soldiers with either a new MOS or ASI will man the MMRs.

1463

AMD Structure Organic to Multifunctional UAs. The future Army concept for Joint operations could include multi-functional units such as Strike UAs and Protection UAs. Both of these UAs could require organic AMD expertise and leadership structure to execute operations. Strike UAs would likely include valuable assets that habitually are prioritized for AMD protection. Strike UA attack operations of asymmetric air and missile threats on the ground must be closely integrated with the active defense aspects of UEx AMD. AMD could be a contributor to any standing or temporary Protection UA as AMD is one of the four mission capability areas (MCAs) defined in the Joint Protection Concept,[46] and AMD battle elements with direct fire capability are frequently employed as a multi-functional combat multipliers in protection roles.

AMD Structure Organic to the UEx and UEy HSOC and DCPs. UE Headquarters manning remains a work in progress and is being developed as part of ongoing experimentation and wargames. Preliminary designs call for the following functionality in the UEx CPs. Designs for the UEy CPs are not yet available. There are a number of assumptions that, if changed, will alter these early estimates. NOTE: UEx HSOC functionality is moving into a "Plans and Analysis Center" (PAC) and UEx DCPs will be referred to as TACs. TF Modularity is briefing the resulting changes for approval and results will be incorporated in the next version of this O&O.

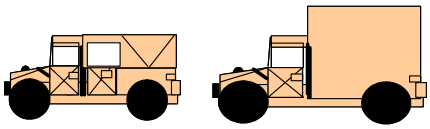
[46] See the Protection Joint Functional Concept (10 January 2004), for a discussion of the Air and Missile Defense Capability Area.

AMD/PLANS/HSOC
(PAR 34)

HSOC

	OFF	WO	EN	
	2	0	3	5
O4	14A00	CH, AMD PLANS		1
O3	14A00	ASST AMD PLANS OFFICER		1
E6	14J30	OPERATIONS SGT		1
E4	14J10	C4I PLANS OPERATOR		1
	2			

2-HMMWV	2-Generators
1-TSQ-XXX	2-TA-1042
2-DAGR	1-MSRT
1-SCAMP	1-GRC-213
1-UXC-7	1-VRC-92F
2-PRC-5	1-GRT
1-AMDWS	1-TC AIMS



HSOC Plans Cell Functions

- Plan, coordinate and synchronize AMD operations for UEx
- Analyze mission (review mission statement, determine assets to be protected, apprise enemy situation and analyze Aerial IPB, review composition & disposition of available AMD resources)
- Develop AMD defense design to ensure forces and HVAs are adequately protected. Determine overall surveillance coverages, engagement coverages, levels of protection required
- Plan Maneuver AMD fires to overmatch tactical threats (UAV, RW, CM, ASM, UCAV and RAM) and mobile ATBM fires adequately protect army vertical maneuver and JIM forces during entry, maneuver operations
- Produce AMD plans that fully integrate operational elements of Active Defense, Attack Operations, Passive Defense and C4I (Battle Command).
- Perform parallel/collaborative planning w/ UExs, UEys, SUA, & AAMDCs; determine Army/JIM LNO requirements
- Assist with A2C2, Air Space Management, planning
- Assist the FEC planning cell
- Plan, coordinate and synchronize Operational Protection of the 3rd Dimension

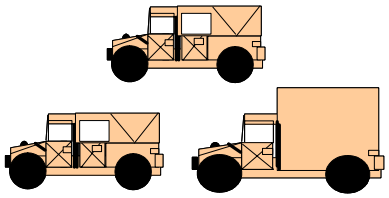
AMD/OPS/HSOC
(PAR 22)

HSOC

	OFF	WO	EN
	3	1	4

04	14A00	CH, HSOC AMD OPS	1
03	14A00	AMD OPS OFF	2
W2	140A	C4I SYS INTG	1
E8	14Z50	OPS SGT	1
E6	14J30	OPS SGT	1
E4	14J10	C4I OPERATOR	2

3-HMMWV	2-Generators
1-TSQ-XXX	3-TA-1042
2-DAGR	2-MSRT
2-SCAMP	1-GRC-213
1-UXC-7	2-VRC-92F
1-MCS-VCU	2-PRC-5
1-GRT	2-AMDWS
1-TC AIMS	1-DSVT



HSOC Operations Cell Functions

- Operational 24/7
- Synchronize UEx AMD operations with JIM/theater AMD forces
- Integrate AMD defense design to ensure forces and HVAs are adequately protected. Determine overall surveillance coverages, engagement coverages, levels of protection required
- Synchronize Maneuver AMD fires to ensure overmatch of tactical threats (UAV, RW, CM, ASM, UCAV and RAM) and mobile ATBM fires adequately protect army vertical maneuver and JIM forces during entry, maneuver operations
- Assign AMD priorities, missions to subordinate AMD forces and assets to be protected; ensure plans executed by subordinate UAs (coverage) are consistent with commander's guidance and intent
- Fully integrate & manage operational elements of Active Defense, Attack Operations, Passive Defense and C4I (Battle Command).
- Request additional AMD assets if coverage of DAL cannot be achieved
- Provide required Army/JIM LNOs
- Support C4I system integration of AMD functions with A2C2 & FEC cells
- Provide and obtain reachback expertise from AMD knowledge & industry base
- Provide Battle Command linkage to joint SIAP integrating/leveraging JIADS early warning systems & EO platforms
- Assist with Air Space Management Operations
- Assist the FEC with Shaping Operations

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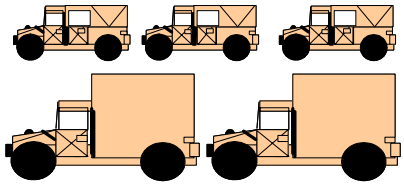
AMD/OPS/DCP 1
(PAR 16)

DCP 1

	OFF	WO	EN
	4	1	8

O5	14A	CH, AMD OPS	1
O4	14A	ASST TAC OPS OFF/LNO	1
O3	14A	ASST TAC OPS OFF/LNO	2
W2	140A	C2 SYS INT TECH	1
E7	14J40	OPS SGT/PLANNER	2
E6	14J30	OPERATIONS SGT/LNO	2
E4	14J10	AMD C4I OPERATOR	2
E3	14J10	AMD C4I OPERATOR	2

5-HMMWV	3-Generators
2-TSQ-XXX	5-TA-1042
2-DAGR	2-MSRT
2-SCAMP	1-GRC-213
1-UXC-7	2-VRC-92F
1-MCS-VCU	2-PRC-5
1-GRT	3-AMDWS
1-TC AIMS	1-DSVT



DCP 1 AMD Operations Cell performs the following functions:

- Operational 24/7
- Provide AMD advice with the expertise, experience level appropriate for a UEx Commander
- Monitor current enemy air and missile activities (track location, identification, classification, number of missiles launched, estimated launch & predicted impact points, estimated impact times)
- Battle track friendly AMD operations (unit positions, coverages, PTLs, states of readiness, ACMs in effect, number & type of missiles available, recent activities/operations)
- Coordinate current operations of subordinate AMD forces; pass critical AMD information including changes in ACMs, ROE & DAL; coordinate adjustment of sensor & engagement coverages based on changes in METT-TC
- Ensure JIADS-compliant fire direction of BLOS/NLOS AMD fires
- Assist with Air Space coordination and execution, focusing on Defense Readiness Conditions, Air Defense Warnings and Weapon Control Status.
- Provide an AMD planner to the DCP1 Plans cell on order
- Provide and mange linkage to Joint SIAP managing & developing situational awareness into situational understanding
- Provide staff expertise, capacity to do limited parallel and collaborative planning with UEx, SUAs, functional staff elements (ex – FECC), and to provide required Army/JIM LNO/ADAFCOs (2 TMs)
- Synchronize current Operational Protection of the 3rd Dimension

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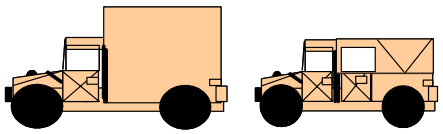
AMD/OPS/DCP 2
(PAR 13)

DCP 2

			OFF	WO	EN	
			2	0	4	6
O4	14A00	DEP CH, AMD OPS				1
O3	14A00	AMD OPS/PLANS OFF/LNO				1
E9	14Z52S	SR OPERATIONS SGT				1
E6	14J30	OPS/PLANS SGT/LNO				1
E4	14J10	AMD C4I OPERATOR				2

2-HMMWV	2-Generators
1-TSQ-XXX	2-TA-1042
2-DAGR	1-MSRT
1-SCAMP	1-GRC-213
1-UXC-7	1-VRC-92F
1-MCS-VCU	1-PRC-5
1-GRT	1-AMDWS
1-TC AIMS	1-DSVT



DCP 2 AMD Operations Cell performs the following functions:

–Advises and counsels UEx commander, staff
–Coordinates AMD Defense Design/CAL/DAL
–Synchronizes AMD theater/tactical augmentation
–Monitors blue AMD, blue & red air, & TBM locations
–Battle tracks blue AMD (unit positions, weapon coverage, sensor plan, changes in ATO, ACM, ROE)
–Monitors JIADS compliant fire direction
–Support C4I system integration of AMD functions with A2C2 & FEC cells
–Provide SIAP Threat Early Warning
–Assist with Air Space Management facilitating user airspace request

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1500 **4-9. AMD Pooling and Stationing.** Future Force AMD pooling and stationing will be
1501 nested with UE, UA, and Joint pooling and stationing decisions. The JOpsC calls for
1502 rapid deployment and employment of decisive Joint forces. There will be no lengthy
1503 buildups allowing forces to integrate and train at intermediate staging bases (ISBs). The
1504 Future Force must *train, alert, and deploy* and *maintain a Joint and expeditionary*
1505 *mindset.* Pooling and stationing decisions must consider combined arms cohesion and
1506 training, deployability, and both combined arms and branch-specific leader development.
1507 AMD *"Foundation Forces"* will be co-located with UEx and Maneuver UAs for training
1508 and cohesion—likely affiliated with a Protection UA. The following table illustrates
1509 some lessons learned by past pooling and stationing arrangements that will be applied to
1510 AMD pooling and stationing decisions and that have general applicability for the Future

Force. The implications of these lessons learned is that we must position the right amount of AMD with combined arms formations that will both enable AMD leader development and combined arms training, cohesion, and deployability.

AMD Pooling/Stationing Lessons Learned

- **Divisional battalion construct**
  - **Provided flexibility to mission tailor force provided to BCTs, Division HVAs**
  - **Allowed for habitual Btry / BCT training relationships**
  - **Enhanced both BOS specific and cross-BOS leader development**
  - **Provided expertise and capacity for cohesive parallel and collaborative planning**
  - **Limited AMD capability**

- **Separate battery construct**
  - **BOS-specific leader development a challenge**
  - **Separate batteries do not perform as well at CTCs as batteries from divisional battalions**

- **Corps AMD brigades pooled away from Corps**
  - **Some BOS efficiencies but combined arms cohesion, integration, cross-BOS leader development challenges**

- **Combined Arms integration and cohesion is most demanding at the tactical level**

4.10. Summary.

The following charts summarize AMD force transformation.

RC AMD Force Transformation

	From	To
Strategic	Strategic Reserve AAMDC No Global Missile Defense	GAMDTF HQ RC AAMDC leading enduring NMS mission set (Homeland Defense) Ground-based midcourse defense BDE
Operational	Resource intensive ARNG Patriot Battalions that take a long time to prepare, deploy	Modernized AMD C2 to conduct JIM-enabling functions/C2 for multiple, dispersed AMD TFs on a regional basis; Battalions rapidly providing trained & ready launchers, elevated sensor modules, ADAFCO cells as required across range of military operations; Located to exploit both training & Homeland Defense synergies;
Tactical	Aging, overmatched Divisional AMD	Modernized AMD TFs performing enduring Homeland Air Security missions and reinforcing limited AC capacity to support Army & Joint MCO requirements; ADAM cells in Brigades

AC AMD Force Transformation

	From		To
	1 – Active AAMDC 1 – RC AAMDC Unable to support 1-4-2-1 strategy	Increases C2 to support 1-4-2-1 strategy	2 – Active AAMDC (UEys) 1 – RC AAMDC ISO Homeland Defense
EAC → (UEy)	2 – EAC AMD Brigade HQ 4 – Patriot battalions	Common C2 enables Multi-functional TF capability	2 – Theater AMD Brigade (NEA, SWA) With 5 BN DCPs that can fight theater non-contiguous, Tailored theater AMD TFs
Corps, Div → (UEx)	3 – Corps AMD Brigade HQ 6 – Patriot Battalions 10 – Divisional Battalions	C2/Shooter Ratio Increases Common C2 Enables Multi-functional TF	6 – modular AMD Regt (1 per UEx PUA) Each with 2 DCPs and batteries that can be tailored into scalable Modular Mobile AMD TFs
Bde → (UA)	- No organic capability -Habitually associated Divisional Btry "Everywhere / all the time"		- ADAM network/leadership structure per UA O&O - Augmentation "where / when required"

Chapter 5. Statement of Required Capabilities (SORCs)

5-1 Capabilities Summary. This chapter summarizes the capabilities required to execute this concept. The need for these capabilities is based on analysis of the Joint AMD capabilities required to support the National Military Strategy and Joint and Army Future Force concepts as well as the Gap Analysis summarized in the chart below.[47] AMD will not need to defend everywhere all the time but will need to provide the right effects at the right place at the right time. This chart describes likely decisive points at strategic, operational, and tactical levels, the threats likely to be encountered at those decisive points, current Joint and Army lethality capabilities, and lethality gaps that must be closed if AMD is to stay ahead of thinking, adaptive adversaries. These lethality gaps

Red Air/Blue AMD Capability GAP Analysis:
Future Army AMD Decisive Points/Gaps

Level/Likely AMD Decisive Pt	Primary Air threat	Currently fielded Joint AMD capabilities	Gap Analysis
Strategic National Capitol Major Cities Ports, Airports High Value Assets Allied/Coalition targets	CM, ICBMs with WMD Commandeered aircraft CM, SRBM, MRBM/WMD	JIM attack Joint counter-air & AVENGER slew-to-cue PATRIOT PAC-3	- Need layered active defense – boost phase, mid-course effects too - Need greater range, lethality to keep aircraft from coasting into target - Need 360 degree MD - Need MRBM killer
Operational APODS, SPODS Assembly Areas Fixed C2 Facilities Key Log, Active LOCS	CM, SRBM, MRBM, LCRs with WMD	Space-enhanced JIM Attack and SOF launch point denial PATRIOT PAC-3	-Need Joint layered defense to aggregate PKs and achieve "near leak proof" standard -Need 360 degree MD -Need MRBM and LCR killer(s); need improved deployability
Tactical Vertical entry/STOM C2 (non BCOM) Key Log, Active LOCs Aviation	RSTA (including low RCS UAVs) - - - →LCRs, Precision Artillery, CMs, TBMs with WMD Non-contiguous, asymmetric battlefield/tactics	JIM attack PATRIOT PAC-3 Overmatched USMC and USA Maneuver AMD	-Need to overmatch low RCS UAVs beyond standoff (see first); -Need mobile multi-functional AMD with 360 degree capability vs mix of asymmetric threats

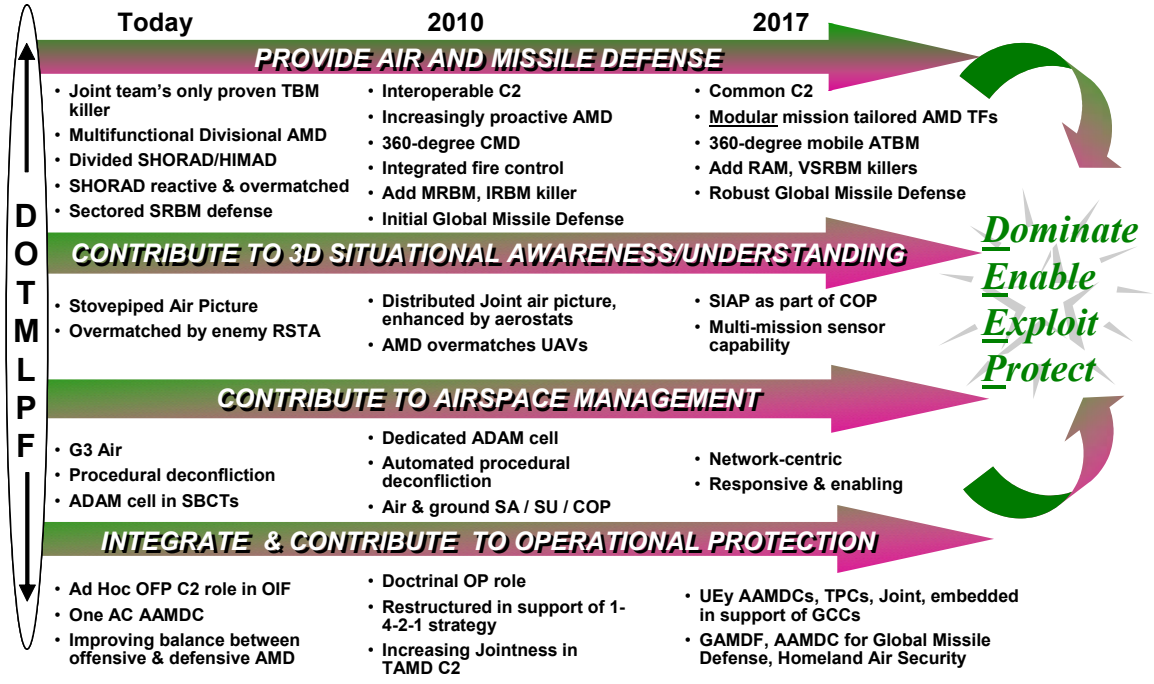
[47] Joint Senior Seminar Wargame (JSSWG). The JSSWG is a senior Army panel formed at the request of JTAMDO and Army G8 to examine the future requirements for theater air and missile defenses, assist in identifying appropriate roles and responsibilities of the Services, and provide specific guidance on Army programs. The JSSWG examined the vulnerabilities of US forces and infrastructure to air and missile threats that could be `employed by potential adversaries.

are part of the larger DOTMLPF (Chapter 6) gaps that must be bridged as we transform the current AMD force to perform the four mission sets and meet the TPG Operational Goals in the Future Operational Environment.

Future AMD modernization must achieve revolutionary changes to ensure the future force will have the required AMD capabilities to dominate, enable, exploit the third dimension battlespace and achieve an integrated operational force protection stance in the Future Operational Environment (FOE). These capabilities will contribute to the larger Joint effort to achieve TPG Operational Goals, and execute the Homeland Defense, Strategic Deterrence, Stability Operations, and MCO Joint Operating Concepts.

5-2 Capabilities Required in AMD Mission Sets. The following chart summarizes where we are today in terms of macro capabilities to perform the four Army AMD mission sets and required current to futures transformation through 2017.

Capabilities Required in AMD Mission Sets



5-3 Statement of Required Capabilities. The capabilities required to execute this concept are summarized below in terms of *Responsiveness and Deployability*, *Mobility and Maneuverability*, *Combat Overmatch and Lethality*, *Interoperability*, *Tailorability and Modularity*, *Sustainability and Training, Survivability, and Multifunctionality*.

5-3.1 Responsiveness and Deployability. Responsiveness is defined as prompt action or reaction that provides for the generation and sustainment of the right Army force*s to* deploy at the time and place the Joint Force Commander requires*. (FM 1.0 / 3.0).* Deployability is defined as (1) the movement of forces within operational areas. (2) the positioning of forces into a formation for battle. (3) the relocation of forces and materiel to desired operational areas. Deployment encompasses all activities from origin or home station through destination, specifically including intra-continental United States, inter-theater, and intra-theater movement legs, staging, and holding areas. (JP 1-02)

AMD forces must be strategically deployable into a theater of operations, must have substantially reduced lift requirements and must deploy ready to fight. Failure to achieve these capabilities will put future forces at risk. Specific capabilities include:

Capability (1): Strategic Deployability. AMD forces must be strategically deployable into an austere theater of operations through multiple, unimproved entry points without relying on fixed ports or staging bases. AMD deployment timelines must be commensurate with those of supported forces

Capability (2): Transportability. AMD forces must be transportable with essential combat loads via inter/intra-theater land, sea, and airlift anywhere in the world. All mobile AMD TF equipment must be transportable by C130 as well as Future Force intra-theater lift aircraft (e.g., SSTOL, VTOL) and High Speed Sealift without reconfiguration.

Capability (3): Strategic Lift Footprint. AMD ATBM forces must achieve significant reductions in strategic lift requirements relative to the current force.

Capability (4): Insertion/Extraction. AMD forces must be capable of being inserted and extracted to efficiently meet the needs of changing battlefield conditions, placing the right amount of forces with the appropriate lethality at the immediate disposal of the supported commander.

Capability (5): Fight on Arrival as Part of a Joint and Combined Arms Team. When deployed, AMD forces must arrive "ready-to-fight." They must roll-off transports and be capable of immediately conducting core AMD missions—providing AMD, contributing to third dimension SA/SU, airspace management, and operational force protection—without having to be reconfigured. AMD forces that habitually fight as part of higher tactical maneuver formations must be stationed to facilitate combined arms training, cohesion and deployability in order to fight effectively on arrival.

5-3.2 Mobility and Maneuverability. Mobility is defined as a quality or capability of military forces which permits them to move from place to place while retaining the ability to fulfill their primary mission (JP 1-02). Maneuver is defined as (1) a movement to place ships, aircraft, or land forces in a position of advantage over the enemy; (2) employment of forces on the battlefield through movement in combination with fire, or fire potential, to achieve a position of advantage in respect to the enemy in order to accomplish the mission [FM 3-0].

AMD forces must be sufficiently mobile and maneuverable to support battlefield operations. Specific capabilities include:

Capability (1):AMD forces must have tactical mobility commensurate with that of the supported force and must be capable of supporting rapid, simultaneous, distributed, non-contiguous operations in future operational environments.

Capability (2): Vertical Entry and Air Mobility. AMD forces augmenting UA and higher tactical UE operations must be capable of horizontal and vertical maneuver. All

mobile AMD TF equipment must fit on C 130 and Future Force intra-theater lift aircraft for vertical entry operations. Selected AMD capabilities must be capable of being vertically inserted or extracted via rotorcraft to support changing METT-TC conditions with minimal footprint. AMD forces must be capable of providing support to the maneuver force during all operations from initial deployment until mission completion as required by METT-TC.

5-3.3 Combat Overmatch and Lethality. Overmatch is defined as a quantitative or qualitative disparity of such magnitude that the stronger force overwhelms the weaker. Overmatch may apply to one or all of the elements of combat power in combination [FM 3.0]. Lethality is defined as the ability to inflict destruction or death (Webster's Ninth New Collegiate Dictionary).

AMD forces must have the capability to overmatch future air and missile threats, execute extended range engagements, and counter saturation attacks. Specific capabilities include:

Capability (1): Threat Overmatch. AMD must be capable of overmatching the full spectrum of air and missile threats that will be encountered in future strategic, operational and tactical fights. This threat set includes all BMs, CMs, UAVs, rockets, artillery and mortar (RAM) projectiles, and tactical air-to-surface missiles (TASMs). Specific capabilities required within this general set include:

- Ground-based Midcourse Defense must be capable of deterring or defeating long-range missile attacks against the Homeland. Capabilities must include the ability to detect, acquire, track, classify, discriminate, identify, engage[48] and assess ICBMs, IRBMs, and MIRVs.

[48] Engagement includes Joint and multinational organic capability to exchange fire control quality data.

- AMD TFs performing Homeland Air Security missions must be capable of detecting, acquiring, tracking, classifying, discriminating, identifying, engaging and assessing CMs and preventing commandeered aircraft from continuing into their intended targets while complying with prescribed rules of engagement (ROE).

- Theater AMD TFs that are capable of defending large areas against low radar cross section (RCS) CM, SRBM and MRBM targets with a high single-shot engagement kill probability (SSEKP). Capabilities will include the ability to detect, acquire, track, classify, discriminate, identify, engage and assess these targets—organically or cooperatively with Joint forces in accordance with ROEs. Theater AMD TFs must be capable of providing integrated fire control to any combination or amount of AMD sensors and shooters and capable of providing C2 to sustained, non-contiguous theater AMD fights. Further, they must be able to conduct cooperative engagements with Joint and multinational forces at extended ranges and conduct Remote Launch with NLOS communications to extend the battlespace.

- Mobile AMD TFs that are capable of providing 360 degree protection to UA and UE vertical entry operations, maneuver forces and high value assets. Mobile AMD TFs must be able to detect, acquire, track, classify, discriminate, identify, engage and assess UAVs, CMs, SRBMs and RAM in accordance with JIM ROE. Mobile AMD TFs must be capable of achieving three distinct lethal capabilities
  - Mobile, 360 degree ATBM and extended range CMD kills.
  - Standoff UAV kills that also provide a lower cost per kill CMD option.
  - RAM killer/direct fire.

  Mobile AMD TFs will also be capable of leveraging FCS-equipped UA's networked fires and NLOS LS Container Launch Units (CLUs)/ Precision Attack Munitions (PAMs) against low and slow portions of the UAV and RW threat in accordance with the UA O&O. They must be able to conduct cooperative

engagements with Joint and multinational forces at extended ranges and conducting Remote Launch with NLOS communications to extend battlespace.

Capability (2): Lethality. AMD TF shooters must have sufficient lethality to ensure single-shot kills and to destroy WMD/E warheads. Selected shooters must possess the ability to have lethal and non-lethal effects when supporting force protection operations.

Capability (3): Extended Range Engagements. AMD TFs must be capable of conducting extended range engagements (BLOS and NLOS). These engagements will allow for the destruction of aerial threats before an adversary can collect information on friendly forces or attack friendly forces, critical assets or defended areas.

Capability (4): Preferential Engagements. AMD TFs must be capable of preferentially engaging targets. Preferential engagements involve the capability to selectively engage threats at the optimum times and locations to maximize probability of kill; counter the highest priority threat first; minimize the expenditure of resources; and minimize collateral damage from debris/fallout.

Capability (5): Rates of Fire. AMD TF shooters must be capable of achieving sufficient rates of fire to counter the saturation attacks likely to be encountered in future warfights.

Capability (6): Plug and Fight. AMD sensors and shooters must be capable of integrating into the common AMD C4ISR network and supporting centralized and de-centralized engagements including integrated fire control engagements to rapidly and efficiently expand area coverage ("plug and fight").

5-3.4 Interoperability and Common C4ISR. Interoperability is defined as the ability of systems, units, or forces to provide services to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together. (JP 1-02). C4ISR includes the command and control, communications,

computer, intelligence, surveillance and reconnaissance capabilities needed to ensure interoperability with JIM forces.

AMD forces must be fully interoperable and integrated with JIM forces and have the following C4ISR capabilities:

AMD Command and Control Capabilities:

Capability (1): Interoperability. AMD C2 systems must be fully compatible and interoperable with the Army Battle Command System and JIM forces.

Capability (2): CPs. AMD must have common CPs capable effectively planning, coordinating, and executing AMD engagement, force, and airspace management operations in a JIM environment. AMD C2 will have common hardware and software that can be leveraged at any echelon for force and engagement operations. The UEy AAMDCs must have the capability of integrating and contributing to JRA operational force protection. This includes integrating or contributing to offensive and defensive theater air and missile operations (TAMO), NBC reconnaissance and defense, HVA protection, route security, physical security, operations security, defensive information operations, anti-terrorism operations, host nation integration, food and water security, and post-attack impact mitigation.

Capability (3): Collaborative Planning Tools. AMD must have an organic capability to plan collaboratively with JIM, UE and UA force C2 nodes at home station, enroute, and in theater. Collaborative planning will allow planning cells at widely distributed locations to use common or compatible planning software and databases to exchange concepts, overlays, and analysis of options. It will also enable planners at all echelons to contribute to the planning process, even when enroute to battlefield operational areas.

Capability (4): Integrated Fire Control. AMD must have the capability to conduct integrated fire control engagements with Army AMD and/or Joint and multinational

AMD forces, including *Engage-on-Remote* and *Forward Pass* engagements. AMD C2 nodes must enable AMD CP, sensor and shooter elements to seamlessly enter and drop out of the C4ISR network as mission dictates. Automated initiating and linking of CPs, sensors and shooters is required to execute effective integrated fire control missions.

Capability (5): Integration with FCS. AMD C2 nodes must be capable of integrating into the FCS-equipped UA battle command system and automatically clearing trajectories of munitions enroute to intended targets to avoid conflicts with UA, UE and JIM. AMD C2 nodes will be capable of precluding fratricide between aerial objects and any AMD shooters capable of achieving effects in space and friendly space objects.

Capability (6): MCG Battle Command on the Move. AMD Mobile Command Group (MCG) C2 detachments must provide battle command on-the-move functionality.

AMD Communication Capabilities.

Capability (1): LOS/NLOS Communications Forward and Backward Compatibility. AMD communication systems must include line-of-sight and over-the-horizon communications that are fully compatible with Army and JIM forces. This includes building in the flexibility to comply with emerging Joint net-ready KPP key interface profiles and backward-compatibility with current systems.

Capability (2): Robust Communications. AMD communications systems must be reliable, secure, high-capacity and jam-resistant and allow the exchange of tactical, operational, and strategic information including data, voice, imagery, and video.

Capability (3): Surveillance and Engagement Support. AMD communications systems must be capable of supporting extended range surveillance and engagement capabilities.

Capability (4): Communications Relays. AMD elevated platforms must be capable of serving as platforms for persistent wide-area communications relay support to AMD, UA and UE forces.

AMD Computer Capabilities.

Capability (1): Common Non-proprietary Hardware/Software. AMD computers must have common, non-proprietary hardware and software,

Capability (2): Open Architecture. AMD computers must have open architectures and be capable of rapid reconfiguration at the supported echelon.

AMD Intelligence Capabilities.

Capability (1): IBS Mining. AMD must be capable of mining IBS and other intelligence data to quickly and efficiently support IPB preparation, attack and engagement operations.

Capability (2). Input to Intel, Fires systems. AMD must be capable of providing intelligence information to JIM intelligence databases and strike forces.

AMD Surveillance Capabilities.

Capability (1): All Weather Third-Dimensional Situational Awareness. AMD must have ground and elevated sensors capable of continuously surveiling the battlespace and detecting, acquiring, tracking, classifying, discriminating, and identifying aerial objects from near ground-level to high altitude, in all types of terrain and weather conditions.

Capability (2): Surveillance Radar Data. AMD sensor information, when processed and distributed, must be capable of being used to facilitate airspace management and to provide tailored situational awareness and early warning to at-risk forces.

Capability (3): Fused COP. AMD C2 must be capable of receiving, correlating, and fusing external track information from JIM sources with local sensor data from both the AMD unit and the supported force to provide a scalable and filterable local SIAP that will be used to provide third dimensional inputs to the COP and thus facilitate force-wide understanding of the battlespace.

AMD Reconnaissance Capabilities.

Capability (1): ISR Payloads. AMD elevated platforms must be capable of supporting ISR payloads.

Capability (2): Observer Capabilities. Selected AMD TF shooters must be capable of employing organic detection devices (e.g., optics, infrared and laser rangefinders) to help AMD Soldiers act as observers to assist Intel and Fires.

Capability (3): Automated Recon Support. AMD must have automated tools to facilitate detailed site and route reconnaissance.

5-3.5 Tailorability and Modularity. [Tailorability] is defined as the assignment of the right amount of personnel and equipment to a unit for the designated mission based on METT-TC (JP 1-02). Modularity refers to construction with standardized units or modules that permit flexibility or variety in use (Webster's Ninth New Collegiate Dictionary).

AMD forces must be scalable, modular and tailorable and must support "plug and fight" concepts. Specific capabilities include:

Capability (1): Scalability. AMD batteries, the basic building blocks for the future AMD force, must be scalable in size to satisfy changing METT-TC requirements. The

number of launchers and sensors in these batteries must be tailorable based on METT-TC.

Capability (2): Common C2, Force Mix and Force Size for TF Modularity. AMD TFs must have common C2 to enable tailoring with the right combination as well as amount of scalable AMD batteries. The AMD force must include the right mix of scalable batteries required to form AMD TFs that can overmatch the full spectrum of threats as described in this concept. The AMD force must have a sufficient number of scalable batteries to meet NMS requirements.

Capability (3): Plug and Fight. AMD TFs must be dynamically tailorable using "plug and fight" capabilities. Sensors and shooters from one AMD battery must be capable of being repositioned and or reaffiliated with any other common AMD C2 element when mission requirements change.

5-3.6 AMD Sustainability and Embedded Training. Sustainability is the ability to maintain the necessary level and duration of operational activity to achieve military objectives. Sustainability is a function of providing for and maintaining those levels of ready forces, materiel, and consumables necessary to support military effort (JP 1-02).

AMD forces must support Future Force sustainment and live and virtual Joint training constructs. Specific capabilities include:

Capability (1): Improvements in Sustainment Efficiency. AMD must enable significant sustainment effectiveness and efficiencies through common, modular components that are highly reliable and readily maintainable; advanced prognostic and diagnostic equipment capable of predicting and isolating failures; small size and increased resource efficiency; multi-function/multi-role capabilities to minimize force structure and reduce logistic requirements.

Capability (2): Commonality. AMD forces must possess maximum commonality with Army systems and maximize AMD components commonality to minimize support bases and parts storage.

Capability (3): Integration. AMD systems must be fully integrated into the Army's transformed maintenance and support systems.

Capability (4): Embedded Training. AMD must have embedded trainers with training capabilities that are linked to the FCS full task trainer system of systems, to Joint and Army force training systems to the combat training centers (CTCs). AMD training must include the capability to conduct live, virtual and/or constructive individual and unit exercises and assess if AMD Soldiers, crews or units demonstrate core competencies to accomplish mission tasks and purposes under realistic conditions in a JIM environment. These embedded trainers must be capable of rapid reconfiguration and of remaining compatible with supported force embedded training software versions in a manner that is transparent to the user.

5-3.7 AMD Survivability. Survivability includes all aspects of protecting personnel, weapons, and supplies while simultaneously deceiving the enemy. Survivability tactics include building a good defense; employing frequent movement; using concealment, deception, and camouflage; and constructing fighting and protective positions for both individuals and equipment. (JP 3-34)

AMD forces must have the capability to survive on future battlefields. Specific capabilities include:

Capability (1): System Survivability. AMD sensors, shooters and C4ISR elements must be capable of surviving enemy attacks, including air and missile attacks, electronic warfare, information warfare, ground-based fires, directed energy attacks, and WMD/E.

Capability (2): Ballistic Protection. AMD warfighting elements must have ballistic protection to maximize survivability against KE and enemy lethal effects.

Capability (3): Hardening. AMD equipment must have sufficient hardening protection from DE weapons such as electromagnetic pulse and high power microwaves.

Capability (4): Signature Reduction. AMD elements must also have reduced infrared and electronic signatures, improved camouflage and concealment, improved electronic countermeasures, improved information and operations security, enhanced data encryption and encoding schemes, and robust collective protection capabilities.

Capability (5): Direct Fire. Selected AMD battle elements must have direct fire capability for self protection and multi-functional roles commensurate with supported UA forces.

Capability (6): Insensitive Munitions Standards. AMD weapons should be developed to insensitive munitions standards to ensure they are safe throughout development and fielding when subjected to unplanned stimuli.

Capability (7): Non-Toxic. AMD weapons must not expose Soldiers to hazardous chemical or other toxic materials.

5-3.8 AMD Multifunctionality. Multifunctionality is defined as a quality associated with a unit or item of equipment that has different purposes or uses, or an individual who can perform a variety of duties or roles. (AMD Campaign Plan)

AMD forces must have force versatility and multifunctional equipment and capabilities to synergistically support JIM operations.

Force Versatility.

Capability (1): Transitioning Capability. Across the range of military operations, AMD units and leaders must be capable of quickly transitioning between engagements and changing mission tasks, purpose and direction to execute branches or sequels, or conducting reconstitution or mission staging without loss of operational momentum.

Capability (2): Multifunctional. AMD TFs, enabled by common C2, must be capable of exercising command and control of any combination of scalable AMD batteries and of leveraging Joint sensors and shooters to execute cooperative engagements.

Capability (3): Four Mission Sets. AMD TFs must be capable of performing all four AMD mission sets—providing AMD, contributing to third dimensional situational awareness, contributing to airspace management, and integrating/contributing to operational force protection.

Multifunctional Equipment and Capabilities.

Multifunctional AMD Sensors

Capability (1): UE AMD Sensor Multifunctionality. UE AMD must have ground-based sensors capable of detecting, acquiring, and tracking air and missile threats and providing fire-control quality data that will support engagement of these threats. All AMD ground-based sensors must be capable of back-plotting missile trajectories and providing targeting information that can be used by attack operations to attack missile launch sites. All UE AMD sensors must be capable of multifunctional contributions to third dimensional situational awareness and understanding and airspace management.

Capability (2): UA MMR Multifunctionality. The Maneuver UA's MMR must have multifunctional capabilities, enabling it to perform air defense surveillance and fire control functions, air traffic control functions and counterfire acquisition functions in accordance with the Future Combat System (FCS) Family of Systems ORD and Maneuver UA O&O.

- When functioning in an AMD surveillance and fire control role, the MMR must be capable of detecting, acquiring, tracking, classifying, discriminating, and identifying objects throughout 360 degrees of the battlespace and providing cueing and fire control information to support the engagement of CMs, UAVs, rockets, artillery, mortars, and, if required, fixed wing and rotary wing aircraft.

- When functioning in an air traffic control role, the MMR must be capable of detecting, acquiring, tracking, classifying, discriminating and identifying objects throughout 360 degrees of the battlespace and providing accurate air picture information to support airspace management operations.

- When functioning in a counterfire acquisition role, the MMR must be capable of detecting, acquiring, tracking, and classifying incoming rockets, artillery and mortars within the sector of interest, accurately determining their firing locations, and providing this information to attack elements in sufficient time to allow the incoming threats to be successfully engaged with minimal fear of collateral damage.

- The MMR must provide the option to either optimize the radar for a particular function or to achieve balanced performance in all three major mission areas.

Capability (3): Elevated Platform Multifunctionality. Elevated platforms employed by AMD TFs must have multifunctional capabilities, enabling them to be used as aerial platforms for sensors, communications relays and other equipment to support a variety of warfighting missions. These missions include surveillance of low-flying, terrain-skirting CMs and UAVs; aerial combat ID support; surveillance of surface targets; support exchange of fire control information among sensors, shooters and in-flight missiles to support AMD NLOS engagements (or cooperative engagements with JIM forces); relay for battlefield communications and collect and disseminate weather information. Elevated platforms must also be capable of supporting ISR payloads. Future Force AMD

must possess elevated platforms of various sizes, and lift capability, that are capable of operating under all battlefield conditions, conducting long duration missions (tethered or untethered), and providing persistent dedicated mission support.

Multifunctional AMD Shooters.

Capability (4): Launcher Multifunctionality for AMD. AMD shooters must be capable of employing common launchers that can fire multiple munitions to optimize effects against the full range of air and missile threats.

Capability (5): Direct Fire. Selected AMD Shooters must be capable of ground combat with high-rate direct fire capabilities.

Capability (6): Joint Launchers. AMD C2 elements must be capable of leveraging JIM sensors and / or shooters as required to execute cooperative engagements.

Capability (7): Commonality, Synergy with Fires. Mobile AMD TFs must be capable of executing surface-to-air engagements from UA NLOS-LS CLUs directly and from the UE AMDTF Maneuver UA's battle command network (networked fires). Objectively, selected UE AMD launchers will be capable of accommodating PAM as well as AMD missiles. AMD C2 will enable UA Fires and Effects crews to leverage any UE AMD launchers that have surface to surface ordnance.

Multifunctional CPs

Capability (8): Multifunctional CPs. AMD CPs must be multifunctional to perform all four AMD mission sets and, with augmentation, to perform other C2 and JIM enabling functions as required for Joint and Army Commanders across the range of military operations.

Chapter 6. Implications

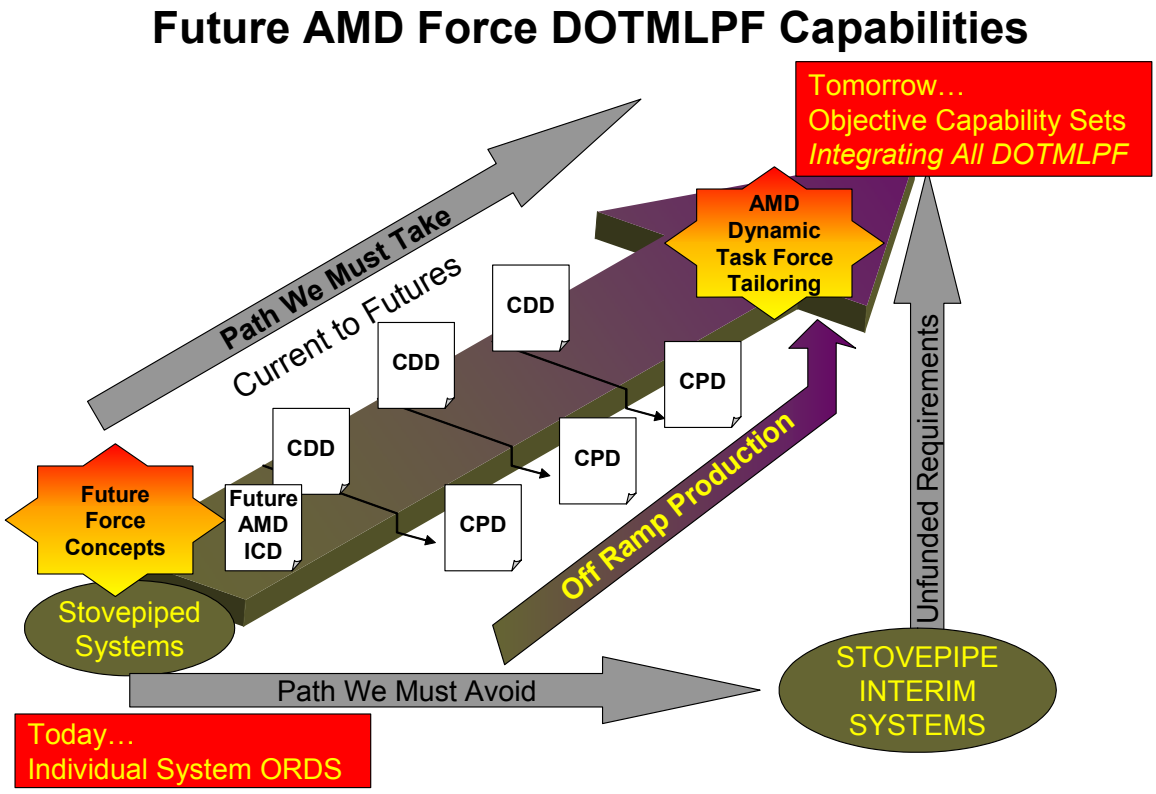
6-1. Implications Summary. This concept and the future Joint and Army transformation concepts it supports requires a holistic recasting of Army AMD across the DOTMLPF domains. The fundamental change in Materiel to a system-of-systems approach, the Organizational transformation to AMD TFs, and the immediate move to force-wide warrior ethos, require synchronized changes in all other DOTMLPF categories. The DOTMLPF changes required to implement this concept are summarized in the table below, described in this chapter, and documented in greater detail in the AMD Campaign Plan, which supports implementation of this concept.

	From	To
Materiel	Stovepiped systems; Reactive & overmatched SHORAD; Sectored SRBM point defense	Modular, multi-functional 360 degree capabilities under common C2 / integrated fire control; Joint system of systems focus; Overmatch all asymmetric air, missile and RAMthreats
Organizations	Fixed, large weapon- centric TOEs; Only 1 AC AAMDC	Modular, scalable multi-functional task forces; AAMDC capability to support 1-4-2-1
Doctrine	Organizational, System-centric, TTP Slow to change	Preemptive & proactive AMD capabilities from UA to UEy; Fast TTP turn to field; CATS to FMs; JIM AMD doctrine
Training	Weapon-centric divisional AMD & Patriot; Train Green, Fight Joint; Generic IMT	TF, Combined Arms & Joint Warriors; Joint / CTC integration; Better institutional warfighter link; "Train joint / fight joint" Assignment oriented training (AOT)
Leadership & Education	Tactically focused DIV AMD, Technically demanding Patriot	AMD leaders who are adaptive, self-aware warriors versed in both Joint & combined arms; Enduring professionalization
Personnel	Multiple, echelon-centric MOSs; Limited assignment opportunities; enlisted & warrant officer unbalanced AGDM pyramid	Functionally aligned MOS / AOCs, greater assignment opportunities; Force-wide warrior ethos; aligned and balanced AGDM pyramid
Facilities	Bliss-centric focus	Whole branch, not just Bliss; Redistribute forces, synched with UA, UE & UEy stationing, RDT&E and Joint CTC

6-2. Materiel. Current Army AMD consists of multi-layered and multi-tiered capabilities that provide high altitude, long range and low altitude, short range air and missile defense protection to deployed forces and high value assets. These capabilities are made up of individual systems with system-unique sensors, interceptors, launchers and C2 centers, which does not provide for adequate modularity and force tailoring. Additionally, these systems have long outlived their expected lifecycles and are no longer feasible to modernize. OIF lessons learned and gap analysis shows that the high altitude systems require too much strategic lift and lack sufficient mobility to keep up with the supported forces. These sectored systems cannot provide adequate protection for widely distributed forces on a non-linear, non-contiguous battlefield. Their C2 systems are stove-piped and not fully integrated with those of Joint and Multinational forces—or even other Army AMD forces—adversely impacting their ability to interoperate effectively. Short-range AMD provides good force multifunctionality but lacks range against standoff threats and lacks lethality against stressing threats. Today's AMD sensors are limited by line-of-sight and do not provide sufficient surveillance and tracking to support NLOS fires against CM and other low-flying threats. Collectively, these materiel related problems not only impact the projection and sustainment of AMD forces, but also AMD's ability to support and protect Joint and Army forces and high-value assets.

To ensure Army AMD forces can be quickly deployed into theater, interoperate seamlessly with JIM partners and overmatch all threats likely to be encountered in the FOE, materiel improvements and new materiel developments must be implemented. Future AMD systems will leverage technology advancements to achieve overmatch against the full spectrum of air and missile threats including UAVs, CMs, RAM, LCRs, ASMs, SRBMs, MRBMs, IRBMs, and ICBMs. AMD will move from system-centric C2 to network centric (plug and fight) C4ISR, capable of operating within the Army and joint systems of systems of framework. AMD materiel transformation, supported by other DOTMLPF changes, will be conducted in increments of improved capability over time from FY04 thru FY17, providing the right amount of capability over time that is required by the force and is cost effective and technologically feasible. These capability increments are the basis for prioritization and enable synchronization of transformation in

a system of systems context. The joint system of systems approach is transformational - - a needed departure from previously stovepiped system acquisition efforts.



Timing of increments may be influenced by resources and Army and joint priorities but are currently envisioned as follows: Increment 1 – FY04 thru FY08; Increment II – FY08 thru FY12; Increment III – FY12 thru FY18. These capability increments will build upon each other to achieve a fully integrated AMD mission tailorable force synchronized with supported Army and Joint force transformation. The initial Increment of AMDTF will consist of the following capabilities: integrated 360 degree CM defense; improved range and lethality; enhanced transportability and mobility; ICBM defense of the Homeland via ground-based midcourse defense; common C4 with enhanced joint and UA linkages; and initial dynamic force tailoring via a common C2 node.

Increment II will add aerial sensors and more mobile ATBM capable of enabling 360 degree coverage of UAs, UEs, and theater HVAs – a great improvement over today's

sectored ATBM force. Increment 2 will vastly increase the coverage footprint, reduce the AMD ground footprint while further improving range, lethality, deployability, and mobility. The common AMD C4ISR will consist of improved C2 nodes expanding AMD force operations and joint integrated fire control capabilities. The aerial sensor platforms will also provide deployed forces a platform to enhance long range communications, real time visual surveillance via enhanced optics, as well as provide SMTI information within the surveillance footprint, enhancing force protection operations as well as enabling detection of low radar cross section UAVs and CMs. The UA's MMR will be capable of reconfiguration to support not only AMD aerial surveillance and fires, but also support counter-fires and air traffic control. Increment II will also provide the initial capability to defeat MRBMs.

Increment III will close the capability gap to defeat incoming RAM through the best combination of directed energy and or kinetic energy solutions. Increment III Common C4ISR will be fully integrated and network centric, distributed, modular, and automated allowing AMD CPs to complete joint, Army and AMD force operations and engagement operations. Ground sensors will expand to include 360 degree full hemispheric surveillance and fire control capabilities that perform multiple missions. Munitions will expand to achieve longer range, deeper magazines, lower cost per kill, and be fully integrated with UA, UE, and Joint networked fires. Increment III will also close gaps in ATBM maneuverability and deployability.

The migration from many stovepiped weapons to a system of systems approach is central to AMD transformation to common C2 and scalable, modular, tailored multi-functional TFs. The end state capabilities will enable AMD and supported Army and joint forces to get ahead and stay ahead of adaptive, thinking enemies in the FOE and fully supports Army and Joint transformation timelines and operational goals. The incremental system-of-systems approach allows synchronization of resources to achieve cohesive effects and fully supports the Army current-to-future construct.

To realize these materiel improvements, the materiel acquisition process must be transformed from a system-centric to a capabilities-centric process. This requires

changes in the materiel development community's organizational structures as well as the processes used to perform system engineering and integration, contract management, program funding, and operational requirements development.

While pursuing these three increments of capability, AMD Science and technology will emphasize technologies with most potential to achieve even greater improvements in non-kinetic kill options, cost per kill, magazine depth, effects scalability, active and passive protection and joint system of systems synergy.

6-2. Organization. Many current Army AMD organizations are "stovepiped," system-centric organizations that are difficult to task-organize and deploy. In addition, reserve component AMD Battalions typically are not resourced for sufficient responsiveness to support force projection and Homeland Air Security mission timelines. Currently, only one active component AAMDC is available for deployment to the GCCs, precluding Army AMD from fully supporting NMS requirements for simultaneous Homeland Defense, strategic deterrence, and swiftly defeat 2/win decisively 1 operations.

Future Force AMD will have common expeditionary-focused C2 organizations responsible for planning, integrating, synchronizing, and executing Army AMD operations with JIM forces across tactical, operational and strategic levels of war. AMD force structure will transform to ensure there are sufficient AAMDCs to support the NMS, adding a second AC AAMDC, orienting the two AC AAMDCs to provide full time support to the SWA and NEA GCCs, and transforming and resourcing the RC AAMDC into a Joint organization that fulfills the unique C2 requirements of Global Missile Defense and Homeland Air Security. The AAMDC and AMD Theater Brigade will be organized, designed and equipped to fulfill C2 functions as required for the ARFOR, JFLCC or JTF. This base may be expanded or adjusted through force tailoring per METT-TC requirements. AMD and other types of forces can be tailored into these multi-functional headquarters to support contingency or ongoing stability operations.

To adequately support future operations, Army AMD organizations must transform. They must become modular, scalable, mission-tailorable organizations with multifunctional capabilities. They must become more versatile and agile to support JIM operations and must possess greater tactical mobility, lethality, and survivability to adequately protect and proactively support the operations of our expeditionary and maneuver forces. These organizational imperatives will be achieved through the development and fielding of modularized UEy AMD Brigades and Mobile AMD Regiments that are habitually associated with Corps and, in the future, UEx "foundation forces" for training, cohesion, and deployability.

Leveraging OIF lessons learned, UEy AMD Brigades will have more but smaller Battalions and a higher C2 to shooter ratio than current force echelon-above-Corps AMD Brigades. Initially, these theater Brigades will have ATBM forces. As new capabilities enter the field, the UEy Brigades will have more multi-functional AMD capabilities. At Corps level and below, Army AMD will transform from Brigades and Battalions at Corps level and Battalions at Division level to a pooled force consisting of Regiments. The Regiments will be smaller and more mobile than the UEy Theater AMD Brigades and will be multi-functional with the capabilities needed to support both current Corps, Divisions, and Brigades and Future Force UEx and UA formations. In the near term, AMD brigades will convert to Regiments with composite Battalions consisting of a mix of ATBM and Maneuver AMD capabilities. When Corps/Division Commanders make the transition to UEx/DCP Commanders, AMD will be prepared to cut the battalion echelon and go from Regiment/Composite Battalions to Regiments/DCPs/Scalable Batteries, leveraging DCPs and Deputy Commanders to create AMD TFs with the pool of scalable batteries. Initially, AMD maintenance organizations will be retained at Regimental/Brigade level and transformed to be more scalable and modular like the forces they will support. These maintenance units will provide in theater AMD-peculiar support. Depot-level organizations will provide the second echelon of AMD maintenance. ADAM and A2C2 functionality will migrate from UEx level to UAs as UAVs proliferate and UA battlespace increases leading to the end state described in the UA O&O and Annex G of this concept.

The AMD Future Force vision cannot be attained without critical contributions from the Reserve Component. AMD transformation envisions restructuring the ARNG to support fielding the C2 required to support the enduring Global Missile Defense and Homeland Air Security missions, Ground-Based Midcourse Defense, responsive, modernized forces for Homeland Air Security that are also flexible to meet other NMS requirements, and selected units dedicated to providing trained and ready ATBM launcher and elevated sensor modules.

The AMD TFs derived from the UEy AMD Brigades and the AMD Regiments habitually associated with higher tactical echelons will be tactical level organizations responsible for executing global warfighting operations. AMD TFs will have common DCPs capable of integrating any combination or amount of scalable batteries. Deployed AMD TFs will be able to leverage "plug and fight" architecture to dynamically task organize and tailor to quickly accommodate changes in METT-TC by adding, removing, or moving sensors or shooters. The AMD TFs will be deployable, mobile, lethal, and survivable fighting forces that will be capable of operating with Joint Future Force Battle Command networks and be capable of dynamically sharing sensor, shooter or C4I assets.

6-3. Doctrine. Future AMD doctrine must be more proactive, expeditionary, and offensively-oriented. This doctrine must nest with Army and Joint Future force doctrine, concepts, experiments and wargames. AMD tactics, techniques and procedures (TTPs) must draw from lessons learned during warfighting operations and experiences at Joint / Combined Combat Training Centers (CTCs) and be quickly turned around for exploitation by both the training base and the field.

The evolution of organizations is driven by concepts and refined by doctrine. New doctrine must be developed for employing AAMDCs and tailored AMD formations to support simultaneous, distributed and non-contiguous operations within the netted and distributed joint C4ISR architecture and the joint and interagency architecture in the Homeland. Specifically, new doctrine must be developed for Global Missile Defense and Homeland Air Security operations; AAMDC and AMD operations in support of

UEy/Geographic Combatant Commander (GCC) JTAMD and operational force protection; Mobile AMD operations in support of UEx and UA; and airspace management. This doctrine must be seamlessly integrated with Joint doctrine to optimize planning and execution of warfighting operations at all levels. New doctrine and TTPs will be required to effectively plan and manage battles collaboratively with JIM forces; integrate/contribute to operational force protection; cooperatively execute joint BLOS and NLOS engagements; efficiently conduct airspace operations within the JOA; and dynamically tailor AMD task forces operating in a distributed, non-contiguous joint battlespace. New doctrine will address the full range of military operations as outlined in the Joint Operating Concepts (JOCs) and the full range of conditions to be encountered in the ambiguous FOE. As AMD transforms from platform centric to warfighting force-tailored doctrine, the overall number of doctrinal field manuals will be significantly decreased. TTPs for new AMD formations will evolve rapidly. AMD will quickly transfer lessons learned from operational deployments and training to the rest of the field leveraging a web-based approach.

6-4. Training. Today's training focuses primarily upon specific weapons systems, with limited combined arms integration outside of the Divisions. There is insufficient AMD participation in joint task force training exercises and maneuver force exercises at the CTCs. Furthermore, current AMD unit and collective training exercises, whether live, constructive or virtual, do not address the full spectrum or complexity of operations that will be encountered while performing the four AMD mission sets at strategic, operational, and tactical levels.

Army transformation recognizes the need for increased Joint integration. To support this transformation, AMD training strategies are refocusing to include more AMD participation in training exercises involving joint task forces. These exercises will focus on JIM operations and be conducted under realistic joint / combined battlespace conditions. The exercises must include collective training supported by a netted and distributed Joint virtual training environment.

Joint C2 training must focus on Joint ID, engagement, and airspace management operations and be embedded in all Joint training schedules. Joint training objectives must include refining collaborative planning skills; rehearsing airspace management, combat ID, and joint warning procedures; and coordinating and synchronizing engagement operations—including extended, beyond-visual-range, and cooperative engagements. This training must also include scenarios to develop the skills needed to support non-combat operations like humanitarian relief and counter-drug operations, as well as those required to support high-intensity combat operations in theaters where WMD/E may be employed. Training of RC units will include an increased focus on Homeland Air Security. RC training to support MCO, Strategic Deterrence, and Stability Operations JOCs will mirror that of the AC. Training partnerships between AC and augmenting/reinforcing RC forces will strive to increase cohesion and reduce deployment timelines.

Virtual and constructive simulations will play an important role in training AMD forces. Simulators will be employed to provide realistic individual and collective training before deployment, while en route to the theater, and after arrival in theater. Simulations will feature high fidelity, interactive, theater-relevant threat scenarios that allow Soldiers to train as if they were fighting in the actual battlespace. Embedded training devices are required for AMD systems and will include electro-magnetic environment interference (EMI) and other ambiguities likely to be encountered on a congested, dirty imperfect battlefield against thinking, adaptive enemies. Virtual and constructive simulations will play an important role for distance/distributed learning, especially for RC Soldiers. These simulations will enable Soldiers to maintain system literacy on AMD end items and will help ensure a high state of readiness even when geographically separated from parent units.

In addition to refocusing unit and collective training, AMD must also improve individual training. Advanced individual training for Soldiers must be multifunctional and focused on scalable battery/AMD TF sensor, shooter and C4 end-items. Training must be realigned to minimize the number of MOSs and maximize the use of additional skill

identifiers (ASIs) and assignment oriented training (AOT). Officer Basic training must focus on leadership skills from a total force perspective, as well as core AMD subjects and composite AMD TF operations and must include extensive AOT for system expertise. The Captains Career Course must include extensive training in operating in a JIM environment. Warrant Officer training must include technical AOT that is multifunctional and cross-system, and battle management AOT that focuses on composite AMD TF and JIM operations. All of the above training—for Soldiers, commissioned officers and warrant officers—must inculcate the warrior ethos. Every AMD Soldier is a rifleman. Every AMD leader is well-versed in both Joint and Combined Arms. Every AMD Soldier and leader is a warrior with a Joint and expeditionary mindset. All training must serve the cause of producing Soldiers who live the Army values and Warrior Ethos tenets and who are flexible, adaptive, confident, and competent.

6-5. Leadership and Education. Today's AMD leaders normally develop competencies in either Divisional or Patriot operations. This leads to a bifurcation of skills. Divisional AMD leaders often lack joint command and control skills while PATRIOT-trained leaders often lack combined arms integration skills and experience. Many leaders do not have sufficient knowledge of how to employ AMD systems seamlessly with those of joint and combined arms forces at the strategic, operational, and tactical levels of warfare, nor conduct network-centric air battle planning, management and execution. Also, today's leaders need more comprehensive training in the basic theory, doctrine and practice of warfighting, including mentoring in the "warrior ethos."

To fight effectively in the FOE, all AMD leaders must be familiar with application of doctrinal principles in a JIM context. They must have working knowledge of a broad range of joint and AMD weapons systems and possess knowledge and technical insight on emerging weapons and information technologies. They must have experience conducting operations at multiple echelons and in multiple regions, be capable of readily organizing AMD TFs and converting doctrine into workable TTPs in a variety of ambiguous environments. They must understand how diplomatic, informational, military, and economic (DIME) operations influence one another, and they must consider

these factors in their planning and decision-making. Further, they must be thoroughly educated in the theory, doctrine and practice of joint warfighting. They must be knowledgeable of the principles of warfare and the use of military forces to achieve strategic, operational and tactical goals through the design, integration and conduct of theater strategies, campaigns, and battles. Finally they must be trained in the "warrior ethos" and acquire the distinctive traits of the warrior—discipline, sacrifice, cohesion, strength and authority—all of which are essential for success on future battlefields.

To accomplish these goals, AMD transformation will include a series of leader development initiatives including:

- Leadership training that is more rigorous and emphasizes the "warrior ethos."
- Incorporation of OIF lessons learned and COE into all courses.
- Implementation of Adaptive Thinking and Leadership Training.
- AMD leader participation in CTC exercises and leader development programs that focus on digitization and capitalize on CTC and operational experience.
- Implementation of the Leadership Master's Program.
- Expanded AMD leader participation in Army Distance/Distributed Learning Program to include web-based or Internet-directed self-development.
- Implementation of the JTAMD Course to provide a Joint audience with an understanding of capabilities, limitations and interoperability of the Services' AMD roles.
- Development of *strategic* AMD leaders through progressive exposure to courses in strategic thought and leadership.

- Master Gunner programs that emphasize enduring force-wide professionalism.

- Integration of OES/NCOES/WOES combined training.

- Training in use of effects-based intent and giving/executing mission orders

Successful implementation of these initiatives will enable AMD to produce competent, versatile and adaptable leaders with "warrior ethos," leaders capable of quickly assessing ambiguous situations, making decisions and acting on those decisions—leaders that know "how to think" instead of "what to think," and are capable of leading Soldiers in the complex and lethal environments of the 21st Century.

6-6. Personnel. AMD Soldiers currently work in a variety of echelon-centric MOSs and areas of concentration (AOCs) in Division, Corps and Echelons Above Corps but have limited assignment opportunities due to MOS and gender restrictions and current stationing. Additionally, the NCO/Soldier and Warrant Officer Corps have an unbalanced aggregate grade distribution matrix (AGDM), causing decreased promotion opportunities in several grades. The ongoing AMD Transformation Campaign Plan is changing this, starting now with a phased implementation plan synchronized with AMD, Army and Joint transformation.. The number of MOSs and AOCs will be reduced and functionally aligned, and the recoding of some combat probability codes (CP) will create more assignment opportunities for both male and female soldiers. Additionally, through a restructuring of both the Enlisted and Warrant Officer grade structures, the revised AGDM will facilitate increased promotion opportunities.

Although AMD Soldiers are capable of efficiently operating and maintaining the systems on which they are trained, they cannot quickly transition to other AMD systems in contingency situations. To successfully execute operations in future environments, AMD is developing functionally aligned enlisted MOSs that will be separated into sensors, launchers/shooters, and engagement operations/force operations (EO/FO). This will

allow for increased flexibility for all genders in both assignments and overall technical and tactical proficiency. Warrant Officer MOSs and Officer AOCs will be combined into one AMD warrant officer MOS and one officer AOC respectively, allowing for increased flexibility in assignments and overall utilization.

These initiatives will ultimately develop "pentatheletes"—multifunctional Soldiers skilled in all AMD mission sets and capable of operating and maintaining the common sensor, launcher, missile and C2 elements that will be employed in the future force. These "pentatheletes" must be capable of quickly transitioning from one element to another, in their respective functional areas, without significant loss of proficiency.
Soldiers must be highly competent, flexible and adaptable—capable of executing operations across the full spectrum of operations. They must develop the competencies required to execute the low-intensity, non-combat operations other than war, while maintaining the combat skills required for high-intensity AMD operations. They must be familiar with JIM doctrine and procedures, and must be capable of using advanced information technologies, informational databases, and advanced weapons to execute operations against the full spectrum of air and missile threats.

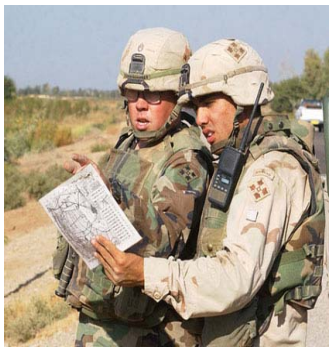
In order for AMD to effectively support JIM operations, the Air Defense Artillery Fire Control Operations (ADAFCO) team will play a crucial role. ADFCO teams will come from the AMD Brigade and Regiment. The team performs coordination and control of AMD weapons systems fires. These actions will be performed from, (but not limited to) the CRC, TAOC, AWACS, and the AEGIS systems. The RC will provide ADAFCO crews to JIM C2 nodes to support Homeland Air Security missions and / or to augment AC AMD.

AMD Soldiers and leaders must be trained in all mission sets, to contribute to SU, airspace management, and operational force protection. Along with their leaders, AMD Soldiers must live the "warrior ethos" and maintain a joint, expeditionary mindset.

Joint and Expeditionary Mindset
Habits of Thought…Manifested in Behavior

Soldier

- *I am **a rifleman first.***
- *I am **part of the joint team** – Soldiers, Sailors, Airmen and Marines fighting together.*
- *I am an expeditionary Soldier - **prepared to deploy 24/7** into any environment and remain until the mission is accomplished.*



Leader

- *I am **a member of the joint profession of arms** – a lifelong student of joint warfare.*
- *I am an expeditionary leader - **unperturbed by uncertainty, adapting rapidly** to austere theaters.*
- *I can **effectively employ modular, joint, interagency and multinational capabilities** to accomplish any mission.*

Army

- *We are part of the joint team first – **a joint capability for joint force commanders***
- *We are expeditionary - **able to simultaneously deploy, employ and sustain** ourselves in land combat anytime, anywhere – limited crisis response or sustained.*
- *We are **deployable**, **mobile**, **agile**, **versatile**, **adaptable**.*
- ***We are at war. We are either in a fight or preparing for the next fight.***

6-7. Facilities. Today's AMD facilities support the development, training and sustainment of AMD organizations and Soldiers. In order to have a campaign quality AMD force, however, AMD facilities must fully support force projection operations and must address Soldier and family well-being. Emphasis must be placed on providing Army and Joint force units with enhanced stationing and training options and ensuring force-wide enhancement of AMD facilities on other posts and at CTCs.

The home of AMD is the largest installation in the Army and must transform to support the interdependent AMD, Army, and Joint Future Force visions:

- A Joint National Training Center (JNTC) capable of hosting joint and combined arms training exercises, where Army AMD forces can train with Joint and Maneuver forces in field and virtual exercises. This will facilitate the training and development of flexible AMD leaders and enable AC and RC AMD forces to

routinely participate in realistic combined arms training that will emulate actual combat. The JNTC must include simulation facilities that will enable it to host distributed JIM training.

- A base-operations support center capable of hosting selected UE AMD organizations and supporting UA and UE training and stationing with full BASOPS, motor pools, billeting, and training ranges.

- A Post-Mobilization Maneuver Training Center where ARNG units can complete post-mobilization training and evaluation.

- A Unit Training and Equipment Site where ARNG Soldiers can complete annual and MOSQ training

- An instrumented test range for conducting directed and kinetic energy testing against RAM and other AMD target sets.

- State-of-the-art strategic deployment center for strategic airlift and rail movement to ports of embarkation.

- An AMD HSOC linked with supported AAMDCs, UE HSOCs, DCPs, and C2 during alert, deployment, and in theater operations will be required to provide reach-back institutional and industry knowledge and technical support. (This includes the communications and associated infrastructure that facilitate the maintenance and repair of systems and streamline the flow of equipment and supplies into a theater of operations as required by the two echelon maintenance construct.)

- To support family well-being, morale, welfare and recreational facilities must be upgraded. Also, installation facilities must be upgraded to protect Soldiers, their families, civilians, contractors and critical infrastructure from terrorist threats.

This will require implementation of improved physical, informational and operational security measures to include installation of CBRNE detection / surveillance equipment as well as contingency decontamination and medical treatment facilities.

The general installation transformation goals above apply to many Army installations, not just AMD. Similarly, specific AMD facilities transformation needs apply Army wide wherever AMD forces are stationed. Future Force pooling and stationing must enable those elements of the pooled force that will habitually associate with, and receive mission orders from, a UEx headquarters to be co-located for training, cohesion, and deployability. Facilities must support AMD integration into joint and combined arms training with appropriate training, maintenance, and frequency resources in garrison, local training areas, and at CTCs.

Annex A. References

Section I: Doctrinal and Administrative Publications

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CJCSM 3107,01	Operation of the Joint Capabilities Integration and Development System, 24 June 2003
CJCSM 3500.04C	Universal Joint Task List, July 2002
Joint Pub 0-2	Unified Action Armed Forces (UAAF), 10 July 2001
Joint Pub 1-02	DOD Dictionary of Military and Associated Terms, 12 April 2001 (w/ Amendment-5June 2003)
Joint Pub 2-0	Doctrine for Intelligence Support to Joint Intelligence, 9 March 2000
Joint Pub 2-01.3	Joint Tactics, Techniques and Procedures for Joint Intelligence Preparation of the Battlespace, 24 May 2000
Joint Pub 3-0	Doctrine for Joint Operations, 10 September 2001
Joint Pub 3-01	Joint Doctrine for Countering Air and Missile Threats, 19 October 1999
Joint Pub 3-01.1	Aerospace Defense of North America, 4 November 1996
Joint Pub 3-01.2	Joint Doctrine for Offensive Operations for Countering Air and Missile Threats, 2nd Draft, 30 August 2001 (to be consolidated into Joint Pub 3-01 by November 2003)
Joint Pub 3-01.3	Joint Doctrine for Defensive Operations for Countering Air and Missile Threats, 1st Draft, 1 March 2001 (to be consolidated into Joint Pub 3-01 by November 2003)

Joint Pub 3-01.5	Doctrine for Joint Theater Missile Defense, 22 February 1996
Joint Pub 3-03	Doctrine for Joint Interdiction Operations, 10 April 1997
Joint Pub 3-07.2	Joint Tactics, Techniques and Procedures for Antiterrorism, 17 March 1998
Joint Pub 3-10	Joint Doctrine for Rear Area Operations, 28 May 1996
Joint Pub 3-13	Joint Doctrine for Information Warfare, 9 October 1998
Joint Pub 3-13.1	Joint Doctrine for Command and Control Warfare, 7 Feb 1996
Joint Pub 3-14	Joint Doctrine for Space Operations, 9 August 2002
Joint Pub 3-16	Joint Doctrine for Multinational Operations, 5 April 2000
Joint Pub 3-18	Joint Doctrine for Forcible Entry Operations, 16 July 2001
Joint Pub 3-30	Command and Control for Joint Air Operations, 5 June 2003
Joint Pub 3-31	Command and Control for Joint Land Operations, Final Draft, 25 April 2003
Joint Pub 3-32	Command and Control for Joint Maritime Operations, 2nd Draft, 30 June 2003
Joint Pub 3-52	Doctrine for Joint Airspace Control in the Combat Zone, Final Draft, 16 April 2003
Joint Pub 6-02	Joint Doctrine for Employment of Operational/Tactical Command, Control, Communications and Computer Systems, 2nd Draft, 9 May 2003
Field Manual 1	The Army, 14 June 2001
Field Manual 3-0	Operations, 14 June 2001
Field Manual 3-52	Army Airspace Command and Control in a Combat Zone, Final Draft, August 2002
Field Manual 3-100.2	Multiservice Procedures for Integrated Combat Airspace

	Command and Control, June 2000
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Field Manual 44-100	US Army Air Defense Operations, 15 June 2000
Field Manual 100-12	US Army Theater Missile Defense Operations, 31 March 2000
Field Manual 101-5-1	Operational Terms and Graphics, 30 September 1997
TRADOC Pam 525	US Army Future Force Operational Concepts, Organizational Design Constructs, and Materiel Needs Implications, Draft, 22 June 2001
TRADOC Pam 525-1-0	Soldier as a System, December 2002 (Coordinating Draft)
TRADOC Pam 525-2-60	The Operational Environment and Threat: A View of the World in 2020 and Beyond, 15 October 2002.
TRADOC Pam 525-3-0	U. S. Army Objective Force Concept, 17 January 2003
TRADOC Pam 525-3-0.1	The U. S. Army Future Force Battle Command (C4ISR) Concept
TRADOC Pam 525-3-04	Future Force Army Aviation Concept of Operations, 4 August 2003 (Final Draft)
TRADOC Pam 525-4-0	Maneuver Sustainment Operations for the Future Force
TRADOC Pam 525-3-07	Homeland Operations Concept, Coordinating Draft, November 2002
TRADOC Pam 525-3-9	Future Force Fires and Effects Concept of Operations, 3 December 2003 (Coordinating Draft)

TRADOC Pam 525-3-25	Army Future Force Maneuver Support Operational Concept (Final Draft)
TRADOC Pam 525-3-90 O&O	The United States Army Objective Force Operational and Organizational Plan—Maneuver Unit of Action, (Change 2), 30 June 2003
TRADOC Pamphlet 525-3-92	The Objective Force Unit of Employment Concept, 2 June 2003
TRADOC Pam 525-4-0	Maneuver Sustainment Operations for the Future Force, 24 September 2003 (Final Approved Draft)
TRADOC Pamphlet 525-5	Advanced Full Spectrum Operations, Draft, August 2001
TRADOC Pamphlet 525-66	Force Operating Capabilities, 30 January 2003
TRADOC Pamphlet 525-82	Operational Concept, Army Ground-Based Midcourse Defense Missile Defense System, 25 September 2001
TRADOC Pamphlet 525-91	Theater Missile Defense Integrating Concept, 7 February 2000

Section II: Visions, Concepts, and Other Publications

Air Force Vision 2020

Army Objective Force Operational and Organizational Concept, Final Draft, 5 February 2001

Army Vision 2010

Forward from the Sea (US Marine Corps Vision)

Joint Functional Concept for Battlespace Awareness (In Progress)

Joint Functional Concept for Joint Command and Control (In Progress)

Joint Functional Concept for Force Application (In Progress)

Joint Functional Concept for Logistics (In Progress)

Joint Functional Concept for Protection (In Progress)

Joint Operating Concept for Major Combat Operations (In Progress)

Joint Operating Concept for Stability Operations (In Progress)

Joint Operating Concept for Homeland Security (In Progress)

Joint Operating Concept for Strategic Deterrence (In Progress)

Joint Operations Concept, November 2003

Joint Vision 2020

Joint Theater Air and Missile Defense (JTAMD) 2010 Operational Concept

Operational Maneuver from the Sea: A Concept for the Projection of Naval Power Ashore

The National Security Strategy for the United States of America, September 2002

The Quadrennial Defense Review Report, 30 September 2001

Transformation Planning Guidance, April 2003

US Army Modernization Plan

Annex B. Explanation of Abbreviations and Terms

Section I: Abbreviations

3D	third dimension
A2C2	Army Airspace Command and Control
AAA	air avenue of approach
AAMDC	Army Air and Missile Defense Command
ABCS	Army Battle Command System
ABL	airborne laser
AC	active component
AD	air defense
ADAM	air defense airspace management
AEF	air expeditionary force
AIT	advanced individual training
AMD	air and missile defense
AO	area of operations
AOC	area of concentration
AOR	area of responsibility
AOT	area of concentration
APOD	air port of debarkation
APS	automated protection system
ARFOR	Army Forces Commander
ARNG	Army National Guard
ASI	additional skill identifier

ATBM	anti-tactical ballistic missile
AWACS	airborne warning and control system
BCOM	battle command on the move
BCT	brigade combat team
BLOS	beyond line-of-sight
BMD	ballistic missile defense
BOS	battlefield operating system
C2	command and control
C4	command, control, communications, computers
C4I	command, control, communications, computers and intelligence
C4ISR	command, control, communications, computers, intelligence, surveillance and reconnaissance
CAFAD	combined arms for air defense
CATS	combined arms training strategy
CBRNE	chemical, biological, radiological, nuclear or high-yield explosive
CDR	commander
CFLCC	Combined Forces Land Component Commander
CLAWS	Complementary Low Altitude Weapon System (USMC SLAMRAAM)
CLU	common launcher unit
CM	cruise missile
CMD	cruise missile defense
COA	course of action

COG	center of gravity
CONOP	concept of operation
COP	common operational picture
CP	command post
CTC	combat training center
DAADC	Deputy Area Air Defense Commander
DCP	deployable command post
DE	directed energy
DOTMLPF	doctrine, organizations, training, materiel, leadership and education, personnel and facilities
E2C	Hawkeye (Navy airborne warning and control aircraft)
EAADS	Enhanced Area Air Defense System
EECP	early entry command post
EMP	electromagnetic pulse
EOR	engage on remote
ETRAC	enhanced target range and classification
FCS	Future Combat System
FDO	flexible deterrent option
FEC	fires and effects cell
FOC	force operating capability
FP	forward pass
FUE	first unit equipped
FW	fixed-wing
GCC	Geographic Combatant Commander

GCS	ground control station
GMD	ground-based midcourse defense
GPS	global positioning system
HAS	Homeland Air Security
HIMAD	high-to-medium altitude air defense
HSOC	home station operations center
HVA	high value asset
IADS	integrated air defense system
ICBM	intercontinental ballistic missile
ID	identification
IFC	integrated fire control
IPB	intelligence preparation of the battlespace
IRBM	intermediate-range ballistic missile
ISR	intelligence, surveillance and reconnaissance
JFACC	joint forces air component commander
JFC	joint forces commander
JFLCC	joint forces land component commander
JIADS	joint integrated air defense system
JIM	joint, interagency and multinational
JLENS	joint land attack cruise missile elevated netted sensor
JNTC	joint national training center
JOA	joint operational area
JRA	joint rear area
JTAMD	joint theater air and missile defense

KE	kinetic energy
KPP	key performance parameter
LACM	land attack cruise missile
LAM	loiter attack munition
LCR	large-caliber rocket
LNO	liaison officer
LOC	line of communications
LZ	landing zone
M3P	multimission mobile processor (follow-on to JTAGS)
MANPADS	man-portable air defense system
MCA	mission capability area
MCO	major combat operation
MCP	mobile command post
MD	missile defense
MEADS	medium extended air defense system
MEF	marine expeditionary force
METT-TC	mission, enemy, terrain and weather, troops and support available, time available, and civil considerations
MMR	multi-mission radar
MOS	military occupational specialty
MOUT	military operations in urban terrain
MRBM	medium-range ballistic missile
NBC	nuclear, biological, chemical
NEA	northeast asia

NLOS	non-line-of-sight
NLOS LS	non-line-of-sight low slow
NORAD	North American Aerospace Defense Command
NORTHCOM	US Northern Command (Homeland Security)
O&O	operational and organizational
OE	operational environment
OIF	Operation Iraqi Freedom
OMFSD	operational maneuver from strategic distances
OPCON	operational control
ORD	operational requirements document
PAM	precision attack munition
PAC-3	Patriot Advanced Capability-Phase 3
QDR	Quadrennial Defense Review
RADC	regional air defense commander
RAM	rockets, artillery and mortars
RC	reserve component
RCS	radar cross section
RDT&E	research, development, test and evaluation
RSTA	reconnaissance, surveillance and target acquisition
SA	situational awareness
SEAD	suppression of enemy air defense
SHORAD	short-range air defense
SIAP	single integrated air picture
SLAMRAAM	surface-launched AMRAAM missile

SLBM	sea-launched ballistic missile
SOF	special operations forces
SPF	special purpose forces
SPOD	sea port of debarkation
SRBM	short-range ballistic missile
SSC	smaller scale contingency
STOM	ship-to-objective maneuver
STRATCOM	US Strategic Command
SU	situational understanding
SWA	southwest asia
TAC	tactical
TAMD	theater air and missile defense
TAMO	theater air and missile operations
TAOC	tactical air operations center
TASKO	tasking order
TASM	tactical air-to-surface missile
TBM	tactical ballistic missile
TF	task force
THAAD	theater high altitude area defense
TM	theater missile
TMD	theater missile defense
TO&E	table of organization and equipment
TP	TRADOC pamphlet
TPG	transformation planning guidance

TRADOC	US Army Training and Doctrine Command
TSOP	tactical standing operating procedure
TTPs	tactics, techniques and procedures
TV	television
UA	unit of action
UAV	unmanned aerial vehicle
UCAV	uninhabited combat aerial vehicle
UE	unit of employment
UEx	unit of employment—tactical echelons
UEy	unit of employment—operational echelons
USAF	United States Air Force
USMC	United States Marine Corps
USN	United States Navy
WMD / E	weapons of mass destruction / effects
WSMR	White Sands Missile Range

Section II: Terms

"1-4-2-1 strategy"	The defense strategy force-sizing construct where 1 equals the defense of the Homeland; 4, the deterrence of aggression and coercion forward with regionally tailored forces in Europe, NEA, the East Asian Littoral, and SWA; 2, the swift defeat of aggression in overlapping MCOs; and 1, the preservation for the President of the option to call for decisive victory in one of the MCOs. (Defense Planning Guidance)
air and missile	The synergistic effects of all Joint and combined arms efforts to

defense	dominate, enable and exploit the third dimension of the battlespace in order to protect the force and high-value assets from air and missile threats, enable the UA commander freedom to maneuver, and enable the force to *see* and *act first* by helping destroy the enemy's ability to do the same and by providing enhanced situational awareness. (TRADOC Pam 525-3-90, UA O&O Plan; derived from JP 1-02, JP 3-0, JP 3-01.5)
air defense	All defense measures designed to destroy attacking enemy aircraft or missiles in the Earth's envelope atmosphere, or to nullify or reduce the effectiveness of such attack. (JP 1-02)
Airspace Control Authority	The commander designated to assume overall responsibility for the operation of the airspace control system in the airspace control area. Also called ACA (JP 1-02).
airspace management	Actions that ensure the synchronized use of airspace and enhancement of the command and control of those forces using that airspace.
air superiority	That degree of dominance in the air battle of one force over another which permits the conduct of operations by the former and its related land, sea and air forces at a given time and place without prohibitive interference by the opposing force (JP 1-02)
AMD task force	A temporary grouping of AMD units, under one commander, formed for the purpose of carrying out a specific AMD operation or mission. AMD task forces can be formed at strategic, operational or tactical levels, with task force composition dependent upon METT-TC.
anti-radiation missile	A missile that homes passively on a radiation source (JP 3-01)
Area Air Defense Commander	Within a unified command, subordinate unified command, or joint task force, the commander will assign overall responsibility for air defense to a single commander. Normally, this will be the component commander with the preponderance of air defense

	capability and the command, control, and communications capability to plan and execute integrated air defense operations. Representation from the other components involved will be provided, as appropriate, to the area air defense commander's headquarters. Also called AADC (JP 1-02)
area of operations	An operational area defined by the joint force commander for land and naval forces. Areas of operations do not typically encompass the entire operational area of the joint force commander, but should be large enough for component commanders to accomplish their missions and protect their forces (JP 1-02)
attack operations	Offensive actions intended to destroy and disrupt enemy TM capabilities before, during, and after launch. The objective of these operations is to prevent the launch of TMs by attacking each element of the overall system, including such actions as destroying launch platforms, RSTA platforms, C2 nodes, and missile stocks and infrastructure (JP 3-01.5)
automated battle management aids	Automated battle management aids use common algorithms and the SIAP to simultaneously produce identical engagement recommendations at each participating node regarding whether, when, and by whom an engagement should be conducted, in accordance with the rules of engagement (JTAMDO JMAA White Paper on Automated Battle Management Aids).
battle element	A task-organized warfighting organization, composed of sensor, weapon and C4 elements, capable of engaging and destroying air and missile threats. The size and composition of a battle element is dependent upon METT-TC and can be quickly changed to accommodate changes in METT-TC.

battlespace	The environment, factors, and conditions commanders must understand to successfully apply combat power, protect the force, or complete the mission. This includes the air, land, sea, space, and the included enemy and friendly forces, facilities, weather, terrain, the electromagnetic spectrum, and the information environment within the operational areas and areas of interest. Battlespace is conceptual—a higher commander does not assign it. Commanders determine their battlespace based on their concept of operations, accomplishing the mission, and protecting the force. Commanders use their experience, professional knowledge, and understanding of the situation to visualize and change their battlespace as current operations transition to future operations. Battlespace is not synonymous with Area of Operations. However, because battlespace is conceptual, Army forces conduct operations only within that portion of it delineated by there are of Operations. Battlespace has an associated area of influence and area of interest. [JP 1-02 and FM 3-0]
C4I	The command, control, communications, computers and intelligence (C4I) system links passive defense, active defense, and attack operations to provide timely assessment of the threat (to include IPB); rapid dissemination of tactical warning; and mission assignment, targeting data, and post-strike assessment to the appropriate JTMD element. For each operational element, the C4I system must provide rapid communications among intelligence assets, the fusion and decision-making facilities, warning systems, and weapon systems, to include a capability for rapid coordination with supporting combatant commanders (JP 3-05.1)

combat identification	The process of attaining an accurate characterization of detected objects in the joint battlespace to the extent that a timely, high-confidence application of tactical options and/or resources can occur. The result of the CID process will be at least, but not limited to, friend, enemy, neutral, or unknown. (JP 1-02.)
common C4	Reconfigurable hardware and software design applied to all AMD C2 nodes (fire unit to AAMDC). Elements of commonality include the same function being performed the same way, click on desired applications (at each or all echelons and either EO or FO), common symbology, and real-time interaction between engagement and force operations.
common operational picture (COP)	A single identical display of relevant information shared by more than one command. A common operational picture facilitates collaborative planning and assists all echelons to achieve situational awareness. Also called COP. JP 1-02
decisive point	A point, if retained, that provides a commander with a marked advantage over his opponent. Decisive points are usually geographic in nature but could include other physical elements such as enemy formations, command posts, and communication nodes. (FM 101-5-1)
directed energy weapon	A weapon that employs *directed energy* as a direct means to damage or destroy enemy equipment. *Directed energy* is an umbrella term covering a variety of technologies that relate to the production of a beam of concentrated energy, atomic or subatomic particles. (DOD)
engagement operations	Engagement Operations consists of those functions required to execute the air battle. This includes establishing an air picture, determining the classification (identity) of all tracks, evaluating the threat these tracks pose to the firing units and other assets,

	and exercising engagement control over subordinate units. (Air and Missile Defense Planning and Control System User Functional Description, Version 1, Vol III, 1 November 2001).
engage on remote	An advanced engagement concept that employs one or more non-organic sensors (in lieu of an organic sensor) to provide the fire control quality data upon which an engagement is conducted. (2010 JTAMD Operational Concept).
force operations	Force Operations consists of the actions and functions required to plan, coordinate, prepare for and sustain the total air defense mission. (Air and Missile Defense Planning and Control System User Functional Description, Version 1, Vol III, 1 November 2001).
integrated fire control	The ability of a weapon system to develop fire control solutions from information provided by one or more non-organic sensor sources and conduct engagements based on those solutions. This includes providing mid-course guidance and in-flight updates, or in certain cases, have them provided by a platform other than the launching platform. (Annex E, 2010 JTAMD Operational Concept to the 2000 Theater Air and Missile Defense Master Plan).
intelligence preparation of the battlespace	An analytical methodology employed to reduce uncertainties concerning the enemy, environment, and terrain for all types of operations. Intelligence preparation of the battlespace builds an extensive database for each potential area in which a unit may be required to operate. The database is then analyzed in detail to determine the impact of the enemy, environment and terrain on operations and presents it in graphic form. Intelligence preparation of the battlespace is a continuing process. Also called IPB (JP 1-02)

joint operations zone	An area of airspace in which all users operate simultaneously for mission accomplishment, with equal prioritization and without jeopardizing or sub-optimizing mission demands. It is designated by the JFACC and extends from mud to space.
joint theater air and missile defense	The integration of joint force capabilities to destroy enemy air or theater missiles in flight or prior to launch or to otherwise disrupt the enemy's air and theater missile operations through an appropriate mix of offensive counterair and defensive counterair operations consisting of mutually supportive passive air defense; active air defense; attack operations; and supporting command, control, communications, computers and intelligence measures. Also called JTAMD. (JP 1-02.)
maneuver air and missile defense	The tailored, multi-functional UE air and missile defense units designated to protect tactical formations from the asymmetric threat. Maneuver AMD replaces the legacy term SHORAD; there is nothing short range about UE maneuver AMD systems. Maneuver AMD will not only defeat high end UAVs and rotary wing beyond standoff, but will overmatch cruise missiles at extended ranges and in Increment 2, will defeat incoming rockets, artillery and mortars. Common C2 will enable incorporation of other UE AMD shooters if required. (UA O&O Plan).
mission-tailoring	Assignment of the right amount of personnel and equipment to a unit for the designated mission based on METT-TC.
modular	A series of standardized components that function together as a unit.
multifunctional	A quality associated with a unit or item of equipment that has different purposes or uses, or an individual who can perform a variety of duties or roles.

netted and distributed	An operation which integrates weapons, sensors, and C4 elements into an interconnected and cooperative network dispersed over wide and possibly non-contiguous areas. Netted operations are characterized by the accurate and timely communication of engagement and force operations data among a system's components. Distributed operations are those in which the critical engagement capabilities of a system are physically dispersed at multiple locations on the battlefield, reducing the likelihood of single-point failures.
network centric	An operational architecture with three critical enabling elements – integrated sensor grids closely coupled in time to shooter and C2 processes, weapons reach and maneuver with precision and speed of response, and value-adding C2 processes (to include high-speed automated assignment of resources to need) – that networks a well-informed but geographically dispersed force. (US Naval Institute, Proceedings, Network-Centric Warfare: Its Origin and Future)
operational protection	All actions taken to counter the enemy's forces by making friendly forces, systems and operational facilities difficult to locate, strike and destroy. (CJCSM 3500.04C)
passive defense	Operations that provide essential individual and collective protection for friendly forces, population centers, and critical assets. The principal measures used to accomplish passive defense are tactical warning, reducing targeting effectiveness, reducing vulnerability, and recovery and reconstitution (JP 3-01.5)
plug and fight	The ability of system functional components (weapons, sensors, and C4 elements), not systems, to move into designated positions, emplace, immediately establish communications, and

	automatically integrate into the defense with control exercised by a designated AMD C4 center.
scalable	A measured series of units or effects that are designated for or can be varied within an operation to meet mission demands.
single integrated air picture (SIAP)	The product of fused, common, continuous, unambiguous tracks of all airborne objects in the surveillance area. Each object in the SIAP has one, and only one, track number and set of associated characteristics. The SIAP uses fused near real time and real time data, scaleable and filterable, to support situational awareness, battle management, and target engagements. (UA O&O Plan).
situational awareness, understanding	Actions that provide visualization of the ground, air, and space dimensions of the battlespace. Situational awareness encompasses seeing and knowing the airspace and the objects that fly through it. Situational understanding is the product of applying analysis and judgment to the aerial common operational picture to draw METT-TC conclusions. (AMD O&O)
theater missile	A missile, which may be a ballistic missile, a cruise missile, or an air-to-surface missile (not including short-range, non-nuclear, direct fire missiles, bombs, or rockets such as Maverick or wire-guided missiles), whose target is within a given theater of operation. Also called TM (JP 1-02)
unit of action	A brigade sized force capable of combined arms operation within a 75 km radius of operations executing Full Spectrum capabilities. UAs are fixed organizations that accomplish discrete sets of functions in accordance with prescribed mission-essential tasks. UAs are further designed as modular organizations that can be combined and integrated as the basic

	building blocks of combined arms combat power to form larger formations…UAs will vary in size and number of organic sub-units, dependent on the battlefield functions performed by the unit and its organic capabilities. Capable of operating as an ARFOR as required. (UA O&O Plan).
unit of employment	A divisional sized force (UE X) or corps sized Force (UE Y) that for the UA: facilitates deployment; develops the situation and gains information superiority and retains it throughout the operations; shapes and isolates the battle space; shields; directs entry and decisive operations; synchronizes operations and combat power; facilitates transitions to maintain tempo in multiple battles; sustains forces by synchronizing operations and provides enablers. Acts as the ARFOR or JTF. [Battle Command System (BCS) Capabilities Development Document (CD D)].
weapons-centric	An operational architecture where sensing and engaging capabilities reside on a weapon system or platform. A weapon centric architecture has a limited capability to engage a target based on awareness generated by other systems or platforms.
weapons of mass destruction/effects	In arms control usage, weapons that are capable of a high order of destruction and/or of being used in such a manner as to destroy large numbers of people. Can be nuclear, chemical, or biological or radiological weapons, but excludes the means of transporting or propelling the weapon where such means is a separable and divisible part of the weapons. Also called WMD/E. See also destruction. (JP 1-02.)

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Annex C. Threat Capabilities and Characteristics

Current strategic factors and national strategies coupled with significant demographic, economic, and technological change will alter critical variables in the Operational Environment. New defining characteristics create a wider spectrum of challenges, increase unpredictability, promote instability, and ultimately form a more complex range of operating environments. Future adversaries will seek to asymmetrically exploit real or perceived US weaknesses rather than attempt to counter US strengths. The emerging aerial threat to future US operations will attempt to deny or delay entry of combined and joint forces into theater, perform advanced intelligence, surveillance, and reconnaissance to attack at the time and location of the threat's choosing, and conduct low altitude attacks and ambushes—all with the intent to produce unacceptable casualties and attack US public will. The adversary's means to accomplish these objectives will no longer strictly consist of "traditional aerial threats" such as tactical ballistic missiles, helicopters, and fixed-wing aircraft, but will largely encompass the use of unmanned aerial vehicles, cruise missiles, smart rockets, enhanced artillery and mortar projectiles, intermediate range ballistic missiles, intercontinental ballistic missiles, all with potential WMD/E warheads. In the paragraphs that follow, these threats are summarized, indicative of future threat Orders of Battle, in terms of their characteristics, capabilities, and future trends.

Tactical Ballistic Missiles. Tactical ballistic missiles are categorized as short-range and medium-range surface-to-surface weapons which travel along relatively predictable trajectories, both endo- and exo-atmospheric. Short-range ballistic missiles (SRBMs) have ranges up

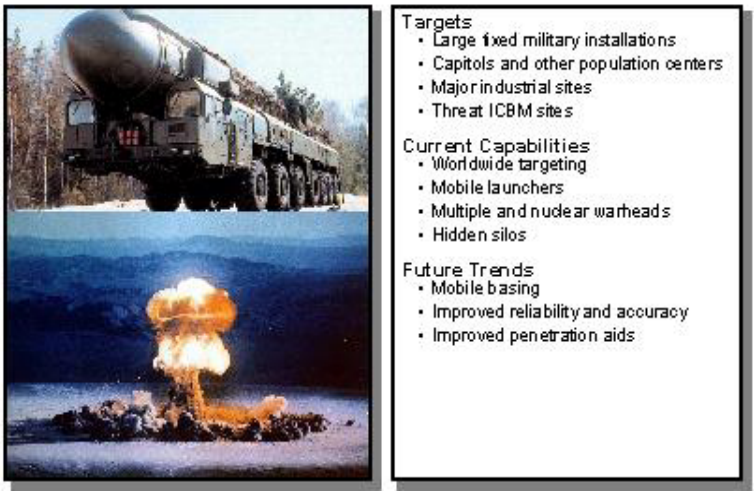
Targets
- Geopolitical/population centers
- Airports and seaports
- Logistical areas
- Troop concentrations

Current Capabilities
- Range from 80 to 3000 km
- Accuracy to within 50 m of target
- Low radar signature
- Warheads – conventional, weapons of mass destruction, submunitions

Future Trends
- Improved accuracy – improved guidance and control packets and terminal guidance
- Increased range – solid propellants, multiple staging
- Increased payload capacity

to 1,000 kilometers. They are typically single-stage liquid fuel missiles with varying degrees of accuracy. However, state-of-the-art guidance technologies will significantly increase their accuracy. SRBMs are often launched from mobile TELs that are difficult to detect. The missiles can carry unitary or submunition warheads with conventional, nuclear, biological, or chemical payloads. The significance of submunition warheads is that interceptors armed with fragmentation warheads cannot kill all of the submunitions. Therefore, SRBMs need to be destroyed by "hit-to-kill" systems that have enough explosive power or kinetic energy to eliminate them completely. Medium-range ballistic missiles (MRBMs) have ranges from 1,000 to 3,000 kilometers. They are typically two-stage liquid fuel surface-launched missiles with ballistic trajectories. Like SRBMs, they are often launched from TELs, but they can also be fired from fixed sites. MRBMs are known to carry unitary or submunition warheads capable of delivering conventional, nuclear, biological, or chemical payloads. What makes SRBMs and MRBMs so threatening is that they can carry extremely lethal warheads, deliver the effects at long ranges, with relatively short warning time. They also can employ countermeasures to defeat or confuse AMD interceptors. They are inherently difficult to defeat because of their small radar cross-section, high in-flight speed, and terminal velocities.

Intermediate Range Ballistic Missiles. Intermediate-range ballistic missiles (IRBM) have ranges from 3,000 to 5,500 kilometers and pose a threat to regional allies and friends. What makes these missiles so threatening is their ability to carry WMD/WME or other payloads great distances. These systems travel at extremely high speeds, fly varied trajectories, employ evasive maneuvers, and use penetration aids such as decoys. They can carry chemical or biological warheads equipped with submunitions.



Intercontinental Ballistic Missiles. Intercontinental ballistic missiles (ICBM) have ranges greater than 5,500 kilometers and pose a direct threat to the US homeland, as well as to regional partners. What makes ICBMs threatening is their great range, extremely high speeds, and variety of targets, which may include political, civilian, or military assets. They usually employ nuclear warheads, and many systems can carry multiple reentry vehicles. Projected improvements include mobile basing, improved reliability, increased accuracy, and improved penetration aids. Some countries may acquire ICBMs through development of space launch vehicles that could be covertly converted to ICBMs. Although the capabilities of nations recently equipped with ballistic missiles will not match those of the United States, Russia, or China, they will nonetheless be able to inflict major damage on the U.S.

Targets
- Large fixed military installations
- Capitols and other population centers
- Major industrial sites
- Threat ICBM sites
- Theater ground targets

Current Capabilities
- Mobile
- Hide, wait, launch from any ocean/sea
- Worldwide targeting
- Multiple warheads – nuclear warheads

Future Trends
- More sophisticated payloads and guidance systems – increased range
- Improved reliability
- Improved penetration aids

Submarine Launched Ballistic Missiles. Submarine-launched ballistic missiles (SLBM) provide ICBM capabilities with the added advantages of better hiding, shorter flight times, and depressed reentry angles. What makes SLBMs threatening is their subsurface mobility, which provides launch location options unavailable to land-based ICBM forces and, therefore, makes detection extremely difficult. SLBM targets will generally be the same as those of ICBMs. Projected SLBM improvements will include more sophisticated payloads and guidance systems, improved reliability, increased range, and improved penetration aides.

Cruise Missiles. Cruise missiles are unmanned, self-propelled, guided aerial vehicles that sustain level flight through the use of aerodynamic lift over most of their flight path and can deliver a lethal payload to a target. Although, the vast majority of cruise missiles are antiship variants, emerging land attack cruise missiles (LACM) variants are expected to become a serious threat as availability and proliferation of these weapons is expected to increase dramatically in the near future. Moreover, rapid conversion of antiship to LACM are possible / likely. Impressive capabilities such as very low-level flight, subsonic speeds, pin-point accuracy, tiny RCS and IR signatures, excellent stand-off range, an all aspect attack capability, as well as various warheads to include, either submunition or unitary, and are ideally suited for WMD delivery. These characteristics make them a lethal weapon that will be difficult to detect and a formidable threat. Traditionally, LACMs have been used in high threat areas against high value stationary targets, but with the advent of smart submunitions for LACMs, mobile targets will become vulnerable too.

Targets
- Geopolitical/population centers
- Airports and seaports; logistical areas
- Command and control centers
- Troop concentrations

Current Capabilities
- Range from 30 to 3000 km
- Highly accurate
- 360-degree threat; very low radar signature
- Air-, sea-, or ground-launched
- Warheads – conventional, weapons of mass destruction, submunitions

Future Trends
- Increased number of land attack variants
- Reduced radar signatures
- Increased use of antiarmor submunitions
- Improved accuracy

Rockets, Artillery and Mortars. Though rockets and artillery are organic to field artillery units and mortars to infantry units, they are grouped together because they exhibit similar characteristics and trends. Artillery is expected to remain the most serious overall threat to unprotected personnel, lightly armored vehicles, and other equipment. What actually makes cannon artillery and mortars so threatening is that they can deliver high rates of firepower with a wide variety of conventional or WMD warheads. Moreover, advances in munitions and delivery systems will increase the ranges, lethality, and accuracy of mortars and artillery.

Long-range artillery rockets are surface-launched, indirect fire weapons with maximum ranges out to 100 kilometers. They can be fired from single or multiple-launch self-propelled launcher vehicles. What makes large-caliber rockets so threatening is that they can deliver both high rates of fire and an array of warheads, including WMD. Their highly mobile launchers can rapidly move around the battlefield, making them ideal weapons systems for fire support missions. Their mobility, range, and salvo capabilities, coupled with short burn times, allows for very limited time for providing warning to maneuver forces.

Tactical Air-to-Surface Missiles (TASMs). TASMs are air-launched guided missiles for use against surface targets and anti-radiation missiles that strike acquisition and surveillance radars and communications nodes.[49] TASM enhancements will include improved accuracy, lock-on-after launch or loitering capabilities, and dual mode seekers for improved reliability and accuracy. They are already widely available, as literally thousands of TASMs are currently operational throughout the world. Not only will TASMs be launched from manned aircraft, they will also migrate to UCAVs. What makes TASMs so threatening is both their adaptability and pinpoint accuracy targeting essential ISR and C4 systems.

[49] Joint Publication 1-02, Department of Defense Dictionary of Military and Associated Terms, April 12, 2001, p.23.

Unmanned Aerial Vehicles. Unmanned Aerial Vehicles (UAVs) can provide precise targeting information in real-time or near real-time to a host of indirect fire weapons system. UAVs include drones that follow pre-programmed flight paths and patterns and remotely piloted vehicles controlled by ground-based operators. UAVs can perform a variety of missions, ranging from reconnaissance and battlefield surveillance to ground attack and electronic warfare. Reconnaissance UAVs serve as platforms for target detection, identification, location, designation, and battlefield damage assessment. State-of-the-art sensors and data links provide real-time targeting for fire support systems, maneuver forces, and aircraft. UAVs equipped with laser designators provide immediate targeting of assets for attack by smart munitions.

UAVs have relatively low radar cross-sections, low speeds, and low thermal signatures, thus making them difficult to detect, track, and engage. In the near term, mission-dictated flight profiles will take full advantage of terrain, increasing system survivability and optimizing coverage and flight altitudes that are safe from small arms fire. UAVs can be equipped with television, infrared video and film cameras, electronic warfare and intelligence suites, radar, and attack warheads. Several nations have developed and fielded anti-radiation homing UAVs with the primary mission of attacking battlefield radios and radar emitters. Future lethal UAVs will have a choice of launch options and usually will be fire-and-forget systems. Attack UAVs armed with warheads will use terminal guidance to kill tanks or fighting vehicles.

Uninhabited combat aerial vehicles (UCAVs) are lethal reusable UAVs that can carry ordnance to destroy ground targets. It is anticipated that UCAVs will eventually replace

some manned strike fighters for high value, high threat missions such as suppression of enemy air defense.

Manned Platforms. Fixed-wing and Rotary-wing aircraft will continue to be a threat to US ground forces however, they will no longer be a design driver for US Air and Missile defense systems. US AMD forces will retain the capability to engage these systems.

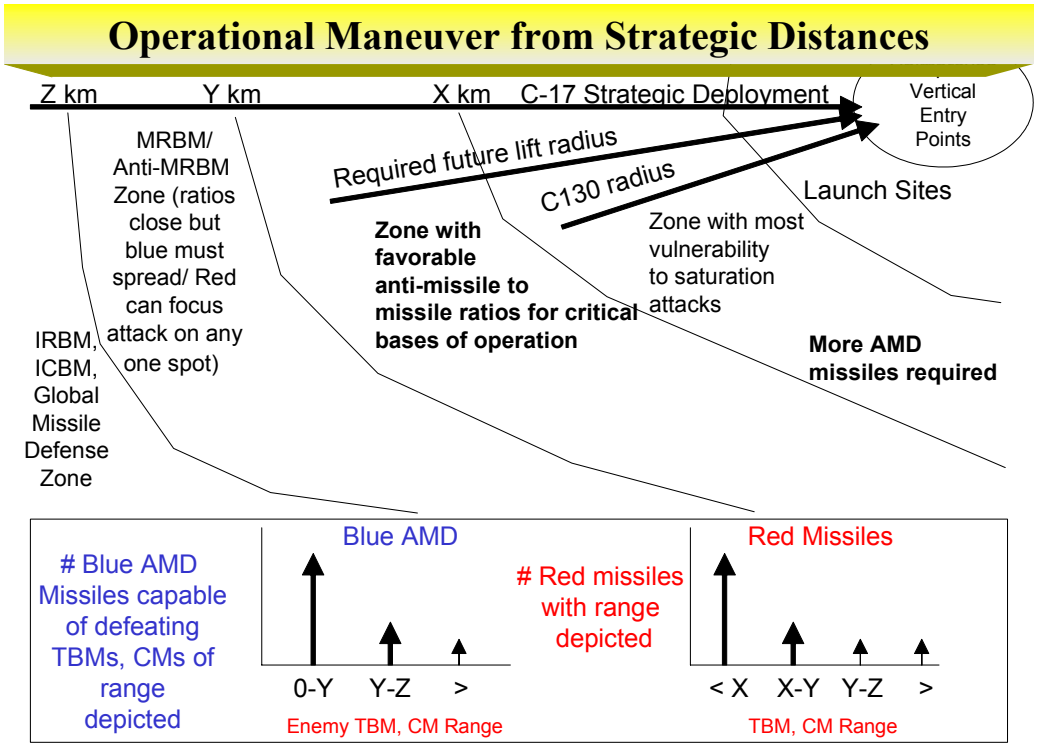
Space Systems. Space systems have emerged as key force multipliers because they offer improved reconnaissance, communications, navigation, and weather monitoring capabilities. Many third world countries can obtain space products from nations hostile or friendly to the US on a "fee basis." The leveling of global technology and the multi-billion dollar commercial space industry have spawned a robust resource that potential adversaries can use to support a variety of military or terrorist operations. Over the next ten years, more than 30 commercial spacecraft of different types will be launched, ensuring access to space products and services for any nation with the money to pay for them. Worldwide access to space system resources will continue to be available to poorer nations through purchasing, leasing, renting, or time-sharing of available assets from space-developer nations or commercial enterprises; some access and products will even be available through the Internet. What makes space systems so threatening is that virtually all future adversaries will have access to them. Many systems previously accessible to only the military will be available on the international commercial market. A good example is a recent report of imagery generated by Israel that was shared with mapping institutions abroad and subsequently used by the Palestinians to obtain precise targeting information of Israel itself.[50]

[50] FBIS, Reuven Shapira, "We Are on the Palestinians' Map," *Ma'ariv*, May 18, 2001.

Appendix 1 to Annex C. Saturation Missile Attack Tactics and Implications)

Because enemies will attempt to saturate friendly anti-missile defenses, a key element in planning and conducting Operational Maneuver from Strategic Distances (OMFSD) will be to ensure that US land and sea bases are located in zones where friendly anti-missile to enemy missile ratios are the most favorable to Joint and multinational forces.

The figure below depicts the zones of varying vulnerability to saturation attacks by ballistic and cruise missiles and addresses trade-offs between investment in AMD system and missile inventories and investment in improved inter-theater lift.



Most enemy missiles have ranges of "X" kilometers or less. Most US AMD systems can successfully engage enemy missiles with ranges of "Y" kilometers or less. The zone bounded by "X" and "Y" is the optimal zone from which to conduct operational maneuver from strategic distances (OMFSD) and launch vertical entry operations.

Staging within "X" kilometers increases the number of AMD systems and missiles required to protect critical bases of operation. Staging between "X" and "Y" kilometers requires more capable lift to conduct OMFSD and vertical entry from this zone.

Once inside an enemy combat zone, the fight is much more non-contiguous. The enemy can fire missiles and rockets 360 degrees; thus, "x" and "y' distances lose relevance inside enemy territory.

Annex D. Linkages to Force Operating Capabilities

TRADOC has identified the Force Operating Capabilities (FOCs) that will be required to implement the Army's Future Force concepts including the Unit of Employment and Unit of Action Concepts. [51] Appendix D crosswalks the AMD required operational capabilities listed in paragraph 3-4 with the TRADOC FOCs.

[TBD—TRADOC is currently revising TRADOC Pam 525-66]

[51] TRADOC Pamphlet 525-66, Force Operating Capabilities.

Annex E. Summary of AMD Support to UA Battlefield Framework[52]

AMD operations described in this concept will contribute to the success of the maneuver UA in all phases of tactical operations by enabling the UA to *see first, understand first, act first and finish decisively*. These contributions will begin before contact with the enemy and continue through tactical assault and transition operations.

Entry Operations. AMD is critical to successful UA entry operations. Even though vertical entry forces will be dispersed to multiple unimproved entry points, the force is vulnerable at those points for extended periods of time. Because vertical entry of maneuver UAs into enemy territory poses such a threat, enemies are likely to react with UAVs, TBMs, CMs, and RAM upon report of US landings. Mission tailored Mobile AMD TFs, with capabilities sequenced early in the flow, will protect the vertical entry force and high value assets during the vulnerable entry period and contribute multi-functional force protection capabilities to help secure the unimproved airfield as required while the maneuver UA disperses.

Actions Before Contact *See First.* To enable the maneuver UA to *see first*, UE AMD forces will force the enemy to *see last* (or not at all) by conducting counter RSTA operations, destroying UAVs beyond standoff and ambushing any attempts at aerial SOF insertion. UA MMRs and available UE AMD and Joint ground and elevated sensors will provide extended range surveillance to contribute to third dimension situational awareness and understanding. The following chart illustrates the implications of UE AMD's lethal contribution to the UA *see first* fight and the second and third order effects on relative fires, high value asset survivability, casualties, and combat ratios later in the fight.

[52] See Appendix E for a summary of AMD support of tactical battlefield concepts.

UA CEP TRAC WSMR Analysis

Red UAV Detections of Blue Systems

Without AMD Direct Support to UA	With AMD Direct Support to UA
12,587	608

What are the second and third order effects of the "see first" fight on the "understand" and "act first" fight . . .
- **relative fires effectiveness?**
- **Soldier Lives?**
- **High Value Asset survivability?**
- **Freedom to maneuver?**

Understand First. UA and UE headquarters ADAM capabilities and UE AMD forces will enable the maneuver UA to *understand first* by providing tailored situational understanding, contributing to a scaleable and filterable three dimensional COP, providing focused early warning of air and missile attack to at-risk forces, contributing to airspace management, and providing the JIADS tactical and technical expertise require to execute complex time sensitive surface-to-air engagement operations with the Joint identification, engagement and airspace control authorities.

Act First. AMD will enable the maneuver UA to *act first* by supporting offensive operations, denying the enemy the ability to influence the operational area from the third dimension, protecting forces and critical assets, and continuing to contribute to third dimension situational awareness and understanding and responsive airspace management. To support offensive operations, UE AMD will use situational awareness from UA and organic sensors, and other sources, in a Joint collaborative environment, to determine the locations of enemy firing points and associated infrastructure. AMD ground-based and elevated sensors will surveil potential threat firing locations and will monitor movement

of platforms from storage to firing locations as well as preparations for firing. UE Mobile AMD C2 elements will rapidly pass this information to the Strike UA[53], the UE DCP, or appropriate Joint strike forces, killing enemy air and missile threats on the ground prior to launch whenever possible. For those threats that are not destroyed prior to launch, Mobile AMD will surveil the battlespace and destroy enemy threats before they can influence the friendly force operational area.

AMD forces will conduct proactive protection by exchanging fire control-quality data in near-real-time with JIM sensors and C4 elements to conduct extended range surveillance and support BLOS and NLOS engagements. In addition to long range capabilities against CMs, UAVs, and SRBMs, UE AMD will include the modular capability to conduct preferential engagements against incoming RAM.[54] UA MMRs and UE fire control sensors will detect enemy RAM launches and simultaneously cue devastating counter-fire from UA/external surface to surface and air to surface fires and active defense fires from UE AMD. This capability frees up the maneuver UA commander to act more quickly and with less risk to the force when facing unlocated RAM threats.[55]

Actions During Contact. During contact, AMD will enable the maneuver UA to *see first*, *understand first*, and *act first* against an adaptive, thinking adversary by prohibiting the enemy from influencing the objective area from the third dimension, providing continuous tailored situational understanding and focused early warning, and countering direct and indirect fires.

Tactical Assault. AMD forces will enable the Maneuver UA to *finish decisively* and transition to the next engagement by providing protection for the tactical assault force where and when vulnerable, enabling C4ISR for integrated fire control, and providing continuous situational awareness and understanding. AMD intercepts against incoming

[53] A Strike UA is one of the multifunctional Units of Action being considered by the UE ICT and Task Force Modularity efforts.
[54] See the FCS ORD, page G-12, the UA O&O, page 4-62 and the Fires and Effects Concept .
[55] TRAC WSMR Janus Simulation (15-19 December 2002).

rockets and missiles will disintegrate warheads to *finish decisively* and help protect the force.

Transition Operations. Mobile AMD modularity and plug-and-fight architecture[56] will enable AMD to insert and extract capabilities as required to dynamically tailor task forces based on changes in METT-TC. UE AMD will protect any vulnerable concentrations of UA and UEx forces and critical assets during transition operations. It will also continue to provide Joint and multinational connectivity, contribute to third dimensional situational awareness and understanding, focused early warning airspace management and multifunctional force protection.

[56] *Plug and Fight* refers to the ability of system functional components (weapons, sensors and C4 elements) to move into designated positions, emplace, establish communications and automatically integrate into the defense, with control exercised by a designated C4 node.

Annex F. Support to Tactical Battlefield Concepts

The AMD operations described in this concept will support the "tactical battlefield concepts" discussed in the UA O&O. These concepts include *Battle Command*; *Intelligence, Surveillance and Reconnaissance*, *Maneuver*, *Fires*, *Maneuver Support*, and *Maneuver Sustainment*.

Battle Command is the art and science of applying leadership and decision making to achieve mission success. It provides the necessary leadership, direction, motivation and integration of Army forces with other joint forces, multinational forces and interagency elements to conduct dominant maneuver, provide focused logistics, execute precision fires, and realize full dimensional protection.

The AMD operations described in this concept will enable *Battle Command* by providing an information-based network of JIM-linked sensor and C4 elements distributed throughout the battlespace. This network will provide situational awareness and understanding that will aid commanders in visualizing the battlespace and successfully completing their missions. AMD C4 elements will have tactical mission planning and rehearsal capabilities that will allow commanders and their staffs to wargame COAs and formulate battle plans while en route to the theater and during employment operations. These C4 elements will be linked with joint and multinational forces, allowing commanders to collaboratively plan, synchronize, and execute operations. Multi-functional UE AMD elevated sensor platforms will support the force by providing long endurance communication relay support as well as targeting information for NLOS engagements of air and ground targets. AMD network and leadership structure will enable airspace management and linkage with the JIADS ID and engagement authority.

Intelligence, Surveillance, and Reconnaissance (ISR) includes the range of integrated tasks fundamental to gaining and maintaining information superiority—the operational advantage derived from the ability to collect, process, and disseminate an uninterrupted flow of information while exploiting or denying an adversary's ability to do the same.

The AMD operations described in this concept will support ISR in a variety of ways. First, Army AMD forces will destroy enemy airborne RSTA platforms that are surveiling friendly forces, thereby denying the enemy valuable intelligence information on the location and activities of our forces. Second, Army AMD sensors and C4 elements will provide timely information on the location, classification, identification, and activity of air and missile and other threats. This information will be fused with information from other Army, joint and multinational forces and incorporated into a SIAP and COP that will enable all commanders and their staffs to visualize the battlespace. Army AMD sensors and C4 elements will also provide information on the location of enemy ballistic missile launch sites and disseminate this information to joint intelligence centers and attack operations elements. Multi-functional UE elevated sensors will be capable of carrying ISR payloads to support force ISR needs. Army AMD crews will also serve as multifunctional observers while performing AMD missions, observing named areas of interest (NAIs) and reporting activity.

Maneuver includes the range of integrated tasks necessary for the employment of forces on the battlefield through movement, in combination with fires, to achieve decisive overmatch of the enemy. These tasks include protection of the maneuver forces.

The AMD operations described in this concept will enable maneuver operations by providing selective protection that will ensure the survivability of critical maneuver force elements, allowing maneuver force commanders to successfully shape the battlespace and conduct decisive operations. Army AMD forces will have highly mobile sensor and shooter elements capable of sensing or shooting on the move to support the tempo and pace of maneuver force operations. Some sensor and shooter elements will have extended range surveillance and engagement capabilities to provide overwatch protection against RSTA threats as well as those threats capable of delivering WMD/E. AMD forces will, at appropriate times and places on the battlefield, directly support maneuver in the ground fight by using directed energy or kinetic energy weapons to engage surface targets.

Fires include the delivery of all types of ordnance through both direct and indirect means, as well as non-lethal means, that contribute to the destruction, disruption, or suppression of the enemy, facilitate movement, and achieve a decisive impact.

AMD operations described in this concept are integrated with fires. UE AMD will nominate enemy air and missile targets to UE and JIM fires in an attempt to kill enemy launchers, missiles, aircraft, and supporting infrastructure on the ground before they can be employed against friendly forces.

AMD will conduct lethal fires against enemy air and missile threats, ensuring that the most threatening targets are engaged first, the highest priority assets are protected, probability of kill is maximized, shooter resources are conserved, and intercepts occur in areas where collateral damage from debris or fallout is minimized. By killing enemy UAVs beyond standoff, AMD sets the conditions for UA and UE forces to fire first. MMRs will enhance synergy between fires and AMD by simultaneously cueing both devastating counterfire from Field Artillery and other Army and JIM strike assets and AMD active defense fires against RAM threats. In scenario dependent situations, the Maneuver UA FEC and networked fires will be able to leverage UE AMD CLUs for surface-to-surface engagements. Similarly, UA NLOS LS CLUs, under direction of UE mobile AMD task force crews, will be able to leverage UA CLUs for surface-to-air shots when appropriate. UE AMD will protect critical bases of operation, forces, and high value assets within theater when and where vulnerable to enemy asymmetric aerial attacks, enabling Army, joint and multinational forces to execute fires. [57]

Maneuver Support includes tasks necessary to provide freedom of action by enabling and amplifying maneuver and by creating conditions unfavorable to the enemy.

The AMD operations described in this concept are particularly important to the Maneuver Support Imperatives: U*nderstand the Battlespace Environment*, *Enable Theater Access*,

[57] See Fires and Effects Concept and applicable portions of the Maneuver UA O&O

Deny Enemy Freedom of Action, and *Enable Protection and Security*. AMD forces will help commanders *understand the battlespace environment* by providing aerial IPB data and tailored situational awareness and understanding of the third dimension via the SIAP. AMD will help *enable theater access* by employing mission tailored UE augmentation to destroy enemy aerial threats that target entry forces with UAVs, CMs and TBMs. AMD will help *deny enemy freedom of action* by taking away the final high-speed avenue of approach enemies perceived to be available against US forces—the third dimension. AMD will help *enable protection and security* by providing long-range standoff detection of aerial threats and real-time early warning and GIP predictions to at-risk maneuver forces. AMD-related attack operations, active defense operations that destroy air and missile threats decisively and at long range, and passive AMD help enable protection and survivability. Multi-functional AMD, either independently or as a key part of a standing or ad hoc Protection UA, contributes to force protection and security. [58]

Maneuver Sustainment includes the provisioning of essential capabilities, functions, activities and tasks necessary to sustain Army forces throughout the range of military operations and across the spectrum of conflict. Within the National and theater logistics systems, it includes but is not limited to that support rendered by National and Army providers in ensuring the aspects of supply, maintenance, transportation, force health protection, and other services required by aviation and ground combat troops to permit these units to accomplish their missions in combat.

The AMD operations described in this concept will support Future Force maneuver sustainment by providing UE AMD augmentation when and where required to protect mission staging, distribution, resupply and other sustainment operations. AMD will deploy its sensor, shooter and C4 elements as required to help protect LOCs, convoys, landing zones, vertical resupply points, and other areas from asymmetric aerial threats including UAVs, CMs, TBMs, and RWs. When required, multi-functional AMD, along

[58] See applicable portions of the Maneuver UA O&O

with other multi-functional UE forces, may be charged with overall protection responsibilities for portions of the UEx fight to protect sustainment.

Future Force AMD elements can be vertically inserted or extracted as required for the changing demands of the mission. Common C2, launchers, and MMRs increase commonality and reduce sustainment demands. The future AMD force's improved deployability, commonality, scalability, and sustainability are nested with the vision for Future Force maneuver sustainment.

Annex G. AMD Sustainment

Future AMD logistics organizations will be mobile, modular, scalable, tailorable, multi-functional, and rapidly deployable like the AMD Task Force formations they will support. AMD units will rely on area support for common logistical support and will have organic AMD-specific maintenance at appropriate levels that is modular and can disperse in support of dispersed AMD units. Army AMD will meet the two-level maintenance support standard as made possible by the fielding of future AMD force capabilities.

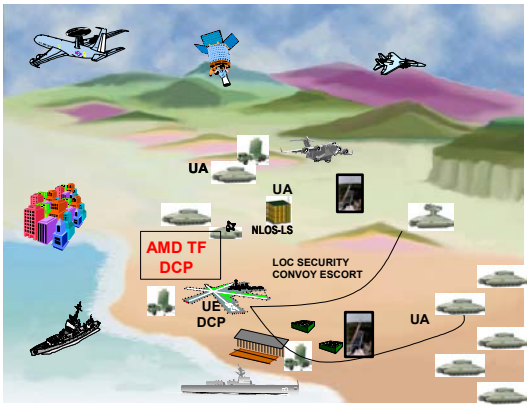
CONOPS – AMD SUSTAINMENT

Task/Purpose: Conduct AMD sustainment operations (man, arm, fuel, fix and move) in order to remain fully mission capable.

Concept:

- Future Force designed with increased reliability, maintainability, availability, modularity, scalability and commonality
- AMD units trained to receive conventional support on an area basis in peace and war
- AMD-specific maintenance units are modular and deploy appropriate modules with dispersed AMD TFs
- Improved sustainment automation in Battle Command system enables unprecedented situational understanding
- Aerial missile resupply;
- Leverage common missile reload capabilities

End State: AMD forces sustain readiness in peace and war.



Requires:

- Increased reliability, availability, maintainability, modularity, commonality, and scalability
- Unit logisticians trained to work combat area support
- Modular AMD maintenance formations capable of servicing all items in TF
- Rapid reload using multiple means
- Common asset visibility

The future AMD force's improved deployability, commonality, scalability, and sustainability are nested with the vision for Future Force maneuver sustainment. Future Force AMD capabilities and missile reloads will be capable of being vertically inserted or extracted as required for the changing demands of the mission. Common C2, launchers, and multi-mission radars (MMRs) increase commonality and reduce sustainment

demands. Future force concepts and capabilities such as the Joint "plug and fight" AMD future force architecture, remote launch, "forward pass", and "engage on remote" allow for more efficient movements when expanding AMD area coverage. Total asset visibility (TAV) and parallel and collaborative planning tools will enable force-wide support of AMD Homeland, Global, theater, and tactical operations. Prognostic and diagnostic test equipment, man-portable computer systems, and the standard Army management information system (STAMIS) will be standardized, integrated, and secure. These systems will be linked horizontally and vertically across the organization and vertically through the combat service support (CSS) community. Component modularization will decrease maintenance manpower requirements and repair times. Innovations in radar and missile technologies will increase reliability. Reliability, availability and maintainability will be built into future AMD systems up front. Using integrated diagnostic test equipment and automated information systems, embedded technologies will provide continuous situational awareness of system status. Requisitioned parts will arrive in hours instead of days and will be tracked via embedded electronics to ensure maintenance of asset visibility.

Annex H. Future Force Airspace Management[59]

Army AMD will contribute to a more responsive and enabling airspace management solution and, in doing so, will help the Maneuver UA, functional and multi-functional UAs, and the UEx to exploit the third dimensional battlespace and act first and finish decisively. UE AMD will provide the Army's link to the Joint identification, engagement, and airspace control authority and will provide the expertise for Joint Integrated Air Defense System (JIADS)-compliant surface-to-air fires.

UA A2C2. Army Airspace Management increases combat effectiveness by promoting the safe, efficient, and flexible use of airspace. Airspace control is provided to prevent fratricide, enhance air defense operations, and permit a greater flexibility of operations. UA airspace management leverages the SIAP. What is different in the Future Force Maneuver UA from the current force is that airspace management enables versus restricts exploitation of the third dimension. In close coordination with the Joint Airspace Control Authority's designated UE/Joint Airspace Management C2 node, the UA orchestrates tactical airspace management. The purpose of the airspace management portion of the UA's C4ISR Network is to provide the common asset visibility, control, procedural coordination, synchronization, and regulation for Army and Joint manned and unmanned aerial assets, indirect fire munitions (LAM, PAM and conventional) and other airspace users. In the Maneuver UA, this is not a separate, stand-alone process, but rather an integrated networked process to enhance UA operations in the Joint Operational Area (JOA).

In order to enable UA operations, the UA staff provides third dimensional analysis and information to the commander and performs aerial staff estimates and battle tracking. Automated battle management processing facilitates rapid prioritization, optimization, and deconfliction during UA airspace planning and coordination. The UA has embedded A2C2 competency, with dedicated Air Defense and Airspace Management (ADAM)

[59] This section closely paraphrases the A2C2 portion of the Manuever Unit of Action O&O Plan dated 30 Jun 2003.

expertise at the UA and Combined Arms Battalion levels. The UA is designed to operate in the most or least restrictive airspace management environments. The UA Fires and Effects Cell include a Forward Air Traffic Control crew and an ADAM crew that can integrate directly with UE, civilian and Joint Airspace Management and JIADS C2 facilities as required. The ADAM crew will be certified as AMD Tactical Directors in addition to their airspace management skill sets. In addition to this dedicated airspace management leadership structure, multifunctional leaders and staff in the UA will be tactically proficient in the coordination and deconfliction of Army and Joint airspace through the use of virtual and constructive training environments. Leaders will acquire these skill sets early in their careers and use them routinely during training events with or without live aircraft present.

During UA airspace management execution, the UA battle command network is aware of the procedural measures in place and tracks current and projected manned/unmanned aerial objects including aircraft, missiles and UAVs. Updates to the COP reflecting this information are rapidly transmitted throughout the network. Trajectories are cleared in a manner that is transparent to commanders. For example, operator-programmed changes in UAV flight patterns are automatically reported to the network and displayed on the COP. Networked fires process missions by selecting launchers with no identified conflicts in the trajectory path. Trajectory clearance algorithms will account for potential changes in flight patterns that may occur during the network data update interval after launch of "dumb" projectiles but will not be such that they limit responsiveness of UA fires. The battlespace for manned aerial platforms is enabled by the COP and are dynamic and three dimensional as opposed to today's restrictive, inflexible corridors prescribed for ACO time blocks. UAVs will have integral collision avoidance to avoid rotary and fixed wing manned aircraft from air service and our coalition partners as well as each other.

Airspace management and control cannot be exclusively automated. The UA retains the capability for human intervention. By exception, a leader can direct changes to UAVs and LAM or automated adjustments can be triggered as necessary via the C4ISR Network. They will also be able to activate procedural measures for manned platforms

whose C4ISR systems are degraded. When not augmented by UE mobile AMD, the UA's A2C2 section will be linked directly into JIADS and will perform any man-in-the-loop positive control required by the rules of engagement in effect to provide joint confidence for close air support over the UA.

UE Airspace Management. To fully realize this enabling, responsive vision for exploiting UA airspace, some changes will need to occur to make overarching joint airspace management processes and procedures less cumbersome and more responsive to the needs of ground force commanders. UE Airspace Management will be a Joint venture and will include the capability to manage an airspace control subsector that directly supports the Maneuver UA's network-enabled, airspace management vision while working harmoniously with the Joint Force Air Component Commander (JFACC) Combined Air Operations Center (CAOC). UE airspace management will directly support the ground force commander in a way that enables his fires and exploitation of airspace, protects friends, and complies with Joint rules and procedures for positive control of Joint airspace. UE CPs include dedicated A2C2 cells with Air Defense Airspace Management (ADAM) functionality.

The capability to control a Joint airspace control subsector for UE Commanders will likely be an expanded, dedicated USAF Air Support Operations Center (ASOC) that will include Joint controllers, Army Aviation air traffic control crews, ADAM crews and Air and Missile Defense Fires Coordination Officer (AMDFCO) crews performing duties as part of the JIADS. The UE will also have modular airspace management capabilities that can augment maneuver or multifunctional UAs. The Details of the UE airspace management construct are being worked as part of the Unit of Employment O&O and Joint discussions; however, it is clear that Army Aviation, Fires, AMD, and other Joint airspace users will all contribute to this Joint and combined arms solution.[60]

[60] The Combined Arms Center (CAC) at Ft Leavenworth is the proponent for UE airspace management and linkage to Joint. USAADASCH, assisted by Ft Sill, Ft Rucker, CAC, UAMBL, and others authored the UA's airspace management concept and are leading implementation efforts with the Future Combat System effort. The UE concept will complement the UA's more network-enabled approach and execution as envisioned.

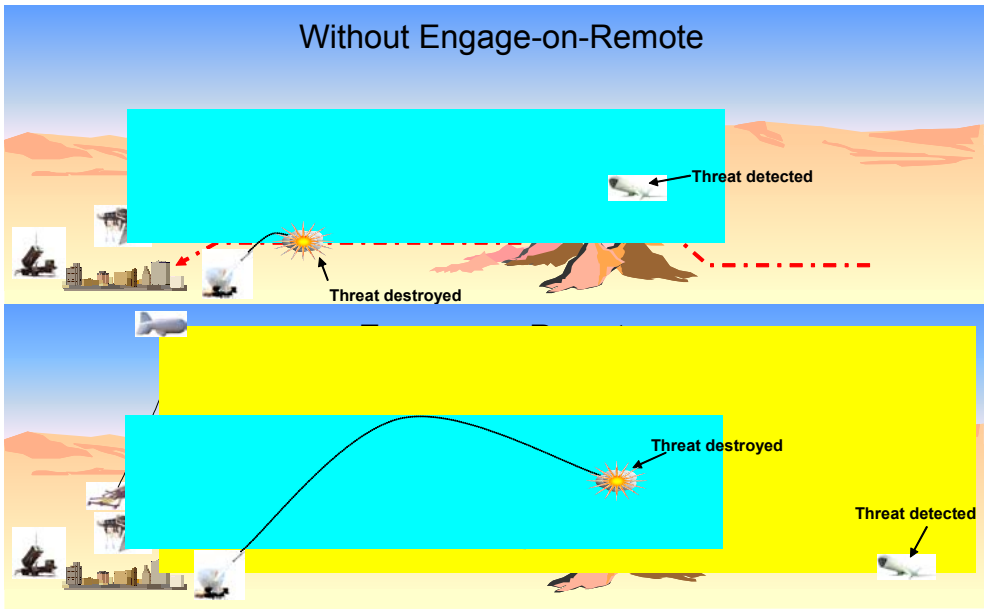
Current to futures airspace management is a work in progress. SBCTs have full ADAMS cells since there is no SDIV. Near term UAs will have fewer UAVs, occupy less battlespace, and typically fight with UE headquarters that have full ADAM functionality; therefore, they will not need as robust an ADAMS cell. In the mid-term, as UAVs proliferate and UAV operations become more decentralized, there Brigades/UAs will need more ADAM functionality. In the future force, full functionality as described in the UA O&O and earlier in this annex will be required.

Annex I. Selected Future Force AMD Tactics, Techniques and Procedures and Illustrative Vignettes

AMD will employ innovative TTPs in future warfighting operations to execute this concept. These TTPs will include the use of *Integrated Fire Control (IFC)* capabilities to engage and destroy aerial threats. IFC is the ability of a weapon system to develop fire control solutions from information provided by one or more non-organic sensor sources and conduct engagements based on those solutions. This includes providing mid-course guidance and in-flight updates, or in certain cases, have them provided by a platform other than the launching platform. The principal IFC techniques are *Engage-on-Remote* and *Forward Pass*.

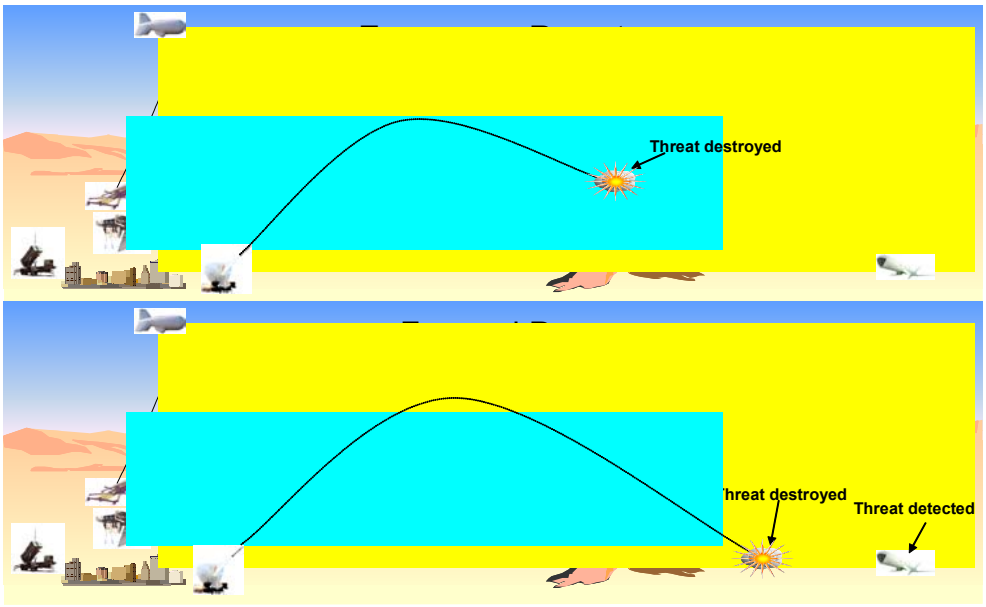
Engage on Remote. Engage-0n-Remote (EOR) enables a surface or airborne weapon system to engage a target using non-organic sensor data. An external sensor, such as an elevated sensor, will provide the weapon system the data required to launch an interceptor at a target. This external sensor will provide fire control quality data on targets masked to the weapon system's organic sensor coverage. For EOR to be successful, line-of-sight must be maintained between the external sensor and the target and connectivity must be maintained between the external sensor and the weapon system. EOR will allow the weapon system to begin the engagement when the target is beyond line-of-sight (BLOS) or non line-of-sight (NLOS) to its organic sensor. This allows missile flight to the target intercept point to occur while the target is masked from the weapon system's organic sensor. EOR, under most conditions, will allow the best use of an interceptor's maximum kinematic range and enable intercept to be achieved before the threat can attack friendly forces or defended assets. A notional EOR engagement is illustrated in the figure below.

Benefits of Engage-on-Remote



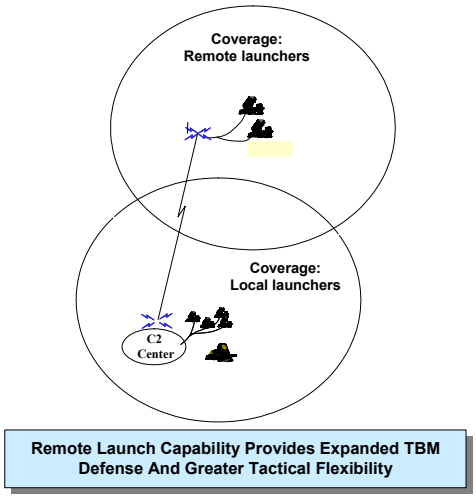
Forward Pass. Forward Pass (FP) is the ability of a weapon system to hand-off its engagement by "passing" control of the interceptor to another system (e.g., an elevated sensor). The weapon system will receive target track data from the aerial sensor, compute the firing solution, and launch the interceptor. Control of the interceptor will be passed to the aerial sensor prior to the start of the endgame in order to complete the engagement. FP will include the ability of the supporting sensor to send to, and receive data commands from, the missile. Because the flight of the interceptor is controlled by an external system at a different location, targets that are NLOS and /or BLOS to the weapon system can be engaged. Under most conditions, FP will give the weapon system multiple engagement opportunities before the threat can attack friendly forces or defended assets. A notional FP engagement is shown in the figure below.

Benefits of Forward Pass

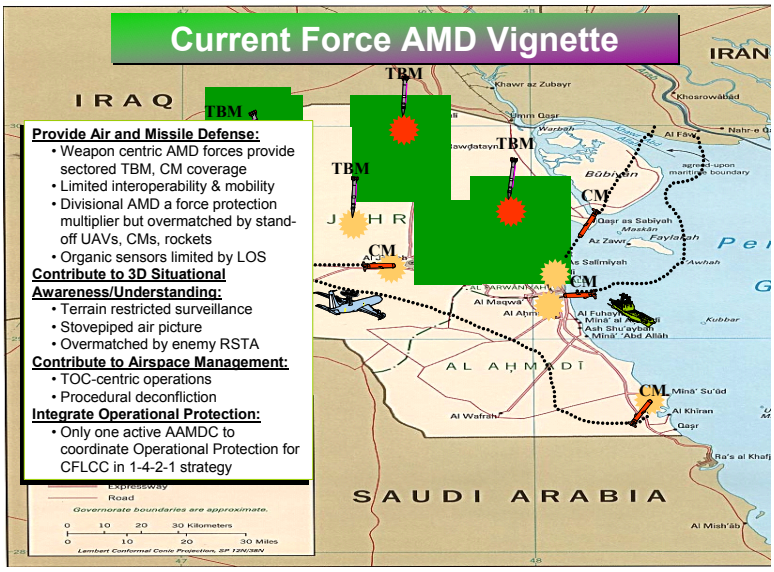


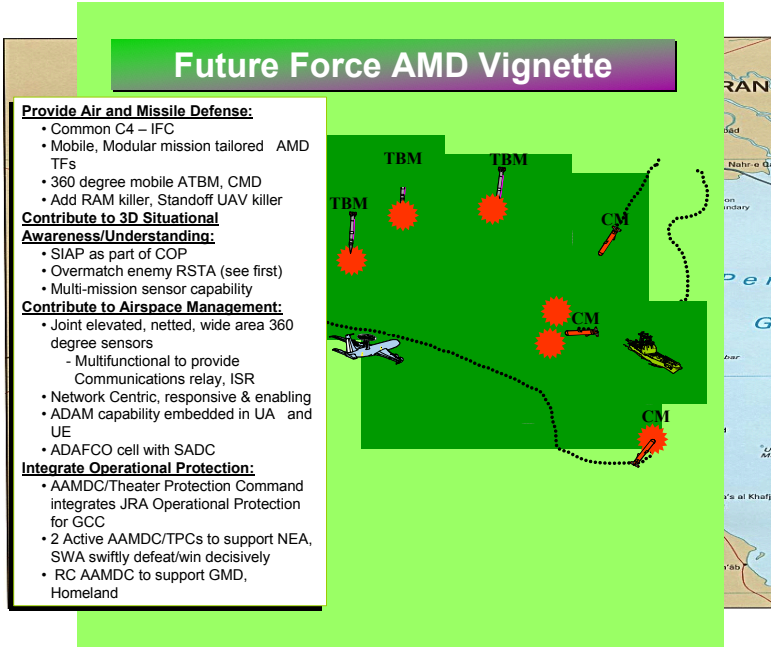
Remote Launch. AMD may also employ Remote Launch capabilities. Remote Launch allows launchers to be emplaced at varying distances from the C2 center to increase defensive coverage, improve flexibility in defense designs, improve survivability or maintain fire power in situations where critical equipment is lost or becomes inoperable. Remote Launch requires voice and data communications between the C2 center and the remote launchers. A notional depiction of Remote Launch capability is shown in the figure below.

Remote Launch Capability



Current and Future Force Comparison. The figures below compare and contrast Current Force AMD capabilities to perform the four AMD mission sets in an MCO with those of the Future AMD Force described in this concept.





Illustrative Vignette. The following vignette describes the AMD role in a notional future MCO between the US and coalition partners and the country of Nair. (TBP).