Chapter 1
Army Air and Missile Defense

This chapter provides an overview of Army air and missile defense (AMD). It presents the role and capabilities of air defense artillery (ADA) and the AMD foundational principles and tenets. It continues with a brief discussion of ADA contributions to today's unified action (joint) operations and unified land operations and to tomorrow's multi-domain operations. The chapter concludes with a discussion of ADA training.

OVERVIEW

1-1. The Army supports joint unified action by conducting unified land operations. While operating as part of the joint force and working with interorganizational and multinational partners, the Army forces gain, sustain, and exploit control over land to deny its use to an enemy. They do this using combined arms formations and capabilities to defeat an enemy and establish control of areas, resources, and populations (FM 3-0). AMD is one of the Army's critical contributions to these efforts. Confronted by decentralized, networked, and adaptive enemies in dynamic and uncertain environments, the Army must possess a versatile mix of capabilities, formations, and equipment to conduct AMD. The ADA force must deter and defeat air and missile threats in support of joint campaigns and assist in achieving air superiority to assure victory in a complex and uncertain world.

1-2. *Air and missile defense* is the direct (active and passive) defensive actions taken to destroy, nullify, or reduce the effectiveness of hostile air and ballistic missile threats against friendly forces and assets (JP 3-01). AMD is embedded in the defensive counterair portion of the joint counterair operational framework. (See paragraph 1-3) AMD is used consistently throughout this document to refer to defensive counterair actions and to the capabilities of other service and multinational partners involved in the counterair fight (for example, Navy AMD). Though not specifically addressed in the AMD definition, AMD implies an interdependency of capabilities across the services and, often, with multinational forces. *Air defense artillery* is defined as weapons and equipment for actively combating air targets from the ground (JP 3-01); more precisely, ADA is the dedicated Army systems, personnel, and forces that provide active, land-based defense against air and missile attacks. ADA forces execute AMD operations. ADA is used consistently throughout the document as the Army's dedicated AMD force; however, there are occasions where "Army AMD" appears in lieu of ADA, generally when addressed in connection with other service AMD capabilities, such as Navy AMD, or when referring to ADA and other Army elements that conduct AMD operations, such as the Joint Tactical Ground Station (JTAGS).

1-3. The joint counterair operational framework is based on the integration of offensive and defensive counterair operations. *Offensive counterair* are offensive operations to destroy or neutralize enemy aircraft, missile launch platforms, and their supporting structures and systems both before and after launch, and as close to their sources as possible (JP 3-01). Attack operations are the predominant offensive counterair operations mentioned throughout this document. Attack operations include offensive action by any part of the joint force in support of the offensive counterair mission against surface targets which contribute to the enemy's air and missile capabilities (JP 3-01). Offensive actions may be conducted before, during, and after launch and, though focused on surface targets in the above definition, can include attacks against airborne command and control (C2) platforms. *Defensive counterair* are all defensive measures designed to neutralize or destroy enemy forces attempting to penetrate or attack through friendly airspace (JP 3-01). Defensive counterair consists of two operational elements: active AMD and passive AMD.

- Active AMD operations. Direct defensive actions taken to destroy, nullify, or reduce the effectiveness of air and missile threats against friendly forces and assets. Active AMD includes *air defense* (defensive measures designed to destroy attacking aircraft and aerodynamic missiles,

or to nullify or reduce the effectiveness of such attack [JP 3-01]) and ballistic missile defense (defensive measures designed to destroy attacking enemy ballistic missiles, or to nullify or reduce the effectiveness of such attack [JP 3-01]). Though not included in the definition of active AMD operations, counter-rocket, artillery, and mortar (C-RAM) is a fundamental part of active AMD. C-RAM operations are defensive measures to destroy, nullify, or reduce the effectiveness of rocket, artillery, and mortar (RAM) threats. For, simplicity sake, air, ballistic, and RAM threats are generally referred to as "air and missile threats" hereafter.

- Passive AMD operations. All measures, other than active AMD, taken to minimize the effectiveness of hostile air and ballistic missile threats against friendly forces and critical assets These measures include detection, warning, camouflage, concealment, deception, dispersion, hardening, and the use of protective construction (JP 3-01).

Note. Fixed-wing aircraft, rotary-wing aircraft, cruise missiles, and unmanned aircraft systems (UAS) have traditionally been referred to as "air-breathing threats," or more commonly as "ABTs" by ADA Soldiers. The term "air-breathing threat" has evolved over time to "air threat" in joint doctrine. Neither term has been formally defined in joint or service doctrine; they are described simply in terms of the threat set that they both encompass. Air threat is used consistently throughout this document to refer to these collective threats.

1-4. In general, while active AMD is the more prevalent counterair operational element in the early phase of campaigns, attack operations reduce the capacity of the enemy to launch air attacks over time, thus decreasing the demand for active AMD munitions in the later stages of the campaign. C2 systems link the planning and execution activities of the other operational elements.

1-5. All defensive and offensive counterair operations are enabled by joint and Army C2 elements and further facilitated by mission command. *Mission command* is the Army's approach to command and control that empowers subordinate decision making and decentralized execution appropriate to the situation (ADP 6-0).

1-6. While all of the operational elements are mentioned in this document, the focus throughout is active AMD and C2 as executed by ADA organizations primarily at the operational and tactical levels. Some discussion of strategic AMD capabilities is presented in appendix A, but most is deferred to FM 3-27 and JP 3-27. The combination of active AMD, attack operations, and passive AMD optimize the use of AMD capabilities in the protection of Soldiers, equipment, and other military and geopolitical assets.

1-7. "Air defense artillery (ADA) units conduct air and missile defense (AMD) operations in support of both the protection, fires, and movement and maneuver warfighting functions" (ADP 3-19). Commanders must execute and integrate fires, in combination with the other elements of combat power, to create and converge effects and achieve the desired endstate. Fires tasks are those necessary actions that must be conducted to create and converge effects in all domains to meet the commander's objectives. For example, a commander may simultaneously employ offensive cyberspace fires to attack an enemy air defense network, air support to destroy air defense C2 nodes, and land- and sea-based AMD fires to defend against air and missile threats. The converged effects provide reduced risk to allied operational aircraft.

1-8. AMD planners at all echelons from AAMDC (Army theater level) to SHORAD battery (division and below tactical level) dialogue with respective protection cell planners to finalize the echelon's defended asset list. Regular coordination is conducted to ensure that the critical assets are protected from air and missile attack and surveillance. Respective AMD organizations should actively participate in protection working groups and provide all working group personnel advised of pertinent AMD directives, actions, and the overall AMD picture.

ADA ROLE AND CAPABILITIES

1-9. The role of ADA is to deter and defeat the range of aerial threats in order to assure allies, ensure operational access, and defend critical assets and deployed forces in support of unified land operations.

1-10. ADA forces conduct AMD operations to support U.S. forces across the range of military operations, from military deterrence and engagement through large-scale combat operations. The primary ADA capabilities in executing AMD operations are:

- Defeat the full range of enemy air and missile threats encountered in current and future geo-strategic, operational, and tactical fights. The threat spectrum encompasses ballistic missiles, ranging from intercontinental to close-range ballistic missiles; cruise missiles; UASs; RAM; tactical air-to-surface missiles; and fixed- and rotary-wing aircraft. Threat details are provided in chapter 3.
- Integrate with Army, joint, interorganizational, and multinational elements. ADA forces establish and maintain tactical data linkages to other service and multinational forces conducting AMD operations. This includes the ability to integrate across multiple weapon systems, sensors, effectors, and C2 nodes at echelon.
- Provide early warning. ADA forces provide early warning by employing sensors to detect air and missile attacks and disseminating attack warnings to forces and, where appropriate, civilian populations. C2 elements disseminate early warnings (and all clear) only to at-risk forces and, when appropriate, to at-risk populations.
- Enhance situational awareness. ADA sensors provide extended range surveillance of the airspace and detect, acquire, track, classify, discriminate, and identify aerial objects from near-ground level to high altitudes, in difficult terrain and in adverse weather conditions.
- Contribute to airspace management. Army airspace management and control functions involve identifying, coordinating, integrating, deconflicting, and regulating the Army need for and use of joint airspace. Army airspace management ensures that airspace users are synchronized in time, space, and purpose interdependently with joint and multinational forces. Air defense airspace management (ADAM) cells in brigade combat teams (BCT) and AMD sections in divisions and corps work with airspace control elements to support management of the airspace.

1-11. ADA forces consistently operate in a joint environment, maintain forward presence, and preserve joint operational access, protecting critical specified military and geopolitical assets throughout each operation. However, given the limitations in force structure as noted in para 1-16, ADA forces are unable to defend all of the critical assets dispersed throughout the theater.

1-12. AMD is inherently a joint and interdependent endeavor. Each component of the joint force contributes capabilities necessary for mission success. In addition, service capability and force structure development reflect a purposeful reliance on all components to maximize complementary and reinforcing effects while minimizing relative vulnerabilities (JP 3-01).

1-13. An ADA task force is a flexible deterrent option, showing U.S. resolve and commitment to our partner nations. For this reason, ADA forces are often called upon to maintain a forward presence. These ADA forces contain high-to-medium altitude air defense capabilities such as those found in the Patriot, Terminal High Altitude Area Defense (THAAD), and AN/TPY-2 forward-based mode radar systems. Thus, ADA forces project national power and set the conditions within the theater for projection of additional combat power.

1-14. Entry operations are likely to be contested, as the time of greatest vulnerability is in the early phases of deployment. Enemy forces are expected to concentrate on access points with air and artillery munitions to deny U.S. build-up of forces. Forward deployed or early entering ADA forces provide defense of these access points to support U.S. massing of critical combat power to seize the initiative. As the campaign progresses, ADA forces, with supporting joint and multinational AMD elements, continue to protect access points, enabling the flow of combat power, logistics, and sustainment elements.

1-15. ADA forces of appropriate strength are allocated to defend critical high value military and geopolitical assets. AMD principles and employment tenets provide a means of assessing the allocation of ADA forces to provide the right force in the right place to adequately defend these assets.

1-16. The number and dispersal of critical assets will exceed the ability of the ADA force to defend against the air and missile threats. The criticality, vulnerability, and threat methodology is used in the planning process to prioritize the assets on the critical asset list and allocate forces to evolve a defended asset list. The methodology enables an understanding of risk to undefended or under-defended assets, and operation plans can be adjusted in accordance with the risk and the AMD defensive coverage available. See chapter 2 for

additional details. Mitigation of some of the capacity shortfalls can be achieved through contributions by the other services' AMD components. In addition, the Army is standing-up additional ADA SHORAD forces and reintroducing them into maneuver formations. ***Short-range air defense*** **are capabilities that provide air defense against low-altitude air threats.** The ADA force is also introducing the Integrated Air and Missile Defense Battle Command (IBCS) system in the near term. IBCS provides a common C2 capability across all ADA echelons. It will allow for efficient task force tailoring of system components, vice complete systems, and the defense of more assets by the same number of ADA units.

AMD FOUNDATIONAL PRINCIPLES AND TENETS

1-17. Fundamental to the planning and employment of ADA forces and the execution of the tasks cited above for joint and unified land operations are the AMD principles and employment tenets. ADA commanders use these to design AMD defenses. When applying the principles and tenets, planners must consider the tactical and technical capabilities of each weapon and sensor system and the relevant factors of mission, enemy, terrain and weather, troops and support available, time available, civil considerations (METT-TC), intelligence preparation of the battlefield (IPB), and AMD priorities.

1-18. The principles provide an underlying rule set. The tenets identify criteria for the positioning of ADA systems.

AMD PRINCIPLES

1-19. Armed with a thorough understanding of the operational environment that is further focused through the lens of current METT-TC conditions, commanders apply AMD principles when planning active AMD operations. A *principle* is a comprehensive and fundamental rule or an assumption of central importance that guides how an organization or function approaches and thinks about the conduct of operations (ADP 1-01).

1-20. The AMD principles are mass, mix, mobility, integration, flexibility, and agility. Mass, mix, mobility, and integration are traditional principles that have stood the test of time. The new principles, flexibility and agility, are inherent considerations for how ADA forces organize and operate on future battlefields.

MASS

1-21. Mass is the concentration of combat power sufficient to achieve the commander's intent. Mass, when applied to AMD, is achieved by assigning enough AMD firepower to successfully defend the force or the asset against aerial attack or surveillance. To mass AMD combat power in one area, commanders may have to accept risks in other areas of the battlefield.

1-22. AMD mass may also be achieved by the launching of more than one missile against a target. In today's system-centric architectures, missile-on-target mass is achieved by assigning the target to an engaging fire unit and that fire unit selecting a method of fire, such as ripple or salvo fire, for assigned launchers to achieve the desired mass. See paragraph 2-32 on page 2-9 for additional discussion of methods of fire.

Note. A fire unit is the smallest group of personnel and equipment capable of conducting a complete engagement, from detection to destruction. In Patriot and THAAD, a firing battery is a fire unit. In Avenger, an Avenger platform constitutes a fire unit.

MIX

1-23. Mix is the employment of a combination of weapons and sensors to protect the force and assets from the threat. Mix offsets the limitations of one system with the capabilities of another and complicates the situation for the attacker. Joint, interorganizational and multinational AMD capabilities are considered when applying this principle. Proper mix causes the enemy to adjust tactics. Enemy tactics designed to defeat one system may make the enemy vulnerable to another system. Mix is achieved by assigning multiple system-centric architectures within a defense design, with each system controlled by its C2 architecture, and coordinating with other systems in the defense. The principle of mix addresses both threat susceptibilities and vulnerabilities and ADA system limitations. For example, complex integrated attacks by enemy forces

seek to find out-of-sector opportunities to defeat friendly AMD defenses. ***Out-of-sector* is defined as that part of the air and missile defense footprint which cannot be covered by a sensor or defended by a shooter.** Some ADA systems can provide 360-degree coverage but are limited in the altitude which can be covered or defended. Other ADA systems are limited in azimuth (sectored).

MOBILITY

1-24. *Mobility* is 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 3-17). ADA units should have mobility that matches that of their supported units or defended assets. Current ADA units cannot match the cross-country mobility of maneuvering forces. However, Avenger systems can move with and maintain defense of the maneuver force's semi-fixed assets, and Patriot and THAAD units have sufficient mobility to move from position to position to continuously extend protection over the supported force on the move. Mobility of ADA units increases their survivability as well as that of their supported assets.

INTEGRATION

1-25. *Integration* is the arrangement of military forces and their actions to create a force that operates by engaging as a whole (JP 1). As an AMD principle, integration constitutes the combination of ADA and other joint counterair forces, systems, functions, processes, and information acquisition and distribution required to efficiently and effectively perform the mission. Integration combines separate systems, capabilities, or functions in such a way that they can operate singly or in concert without adversely affecting other elements. Integration has three sub-elements. Each of these can be applied to the Army architecture or larger joint or multinational AMD architecture.

- Functional integration consists of those activities associated with the allocation, distribution, and synchronization of AMD functions into the Army's theater architecture. These activities are the basis for establishing both the information required and the means to acquire, produce, exchange, and distribute that information for planning, coordination, and execution purposes.
- Operational integration consists of those activities associated with enabling and optimizing the performance and collective effectiveness and efficiency of AMD within the total theater resources.
- Architectural integration consists of those activities associated with establishing, assuring, and enhancing the information interchange within the AMD component elements (organizations, weapons, and communications systems and components) and with the Army theater information architecture (hardware, software, operations, and personnel).

FLEXIBILITY

1-26. *Flexibility is* the employment of a versatile mix of capabilities, formations, and equipment for conducting operations (ADP 3-0). Flexibility enables adaptive forces, facilitates collaborative planning and decentralized execution, and fosters individual initiative (ADP 3-0). The AMD principle of mix (see paragraph 1-23 above) discusses the combination of ADA systems as task force tailored formations. The principle of flexibility is applied in AMD terms primarily within a system's capability to be adapted to different (changing) threat conditions. While ADA systems have a system-centric architecture, each of the architectures enables some flexibility to tailor the defense design to METT-TC conditions. Patriot can defeat ballistic missile threats, cruise missile, and other air threats. The defense can be tailored to primarily defeat a specific threat or to achieve a balance across the full threat set. Balancing across the full threat set may result in less than optimal defense against a specific threat set. Likewise, SHORAD systems can optimize against a specific threat or balance across their full threat set. The C-RAM system can defeat rockets, artillery, and mortars in the air. Optimization against mortars could result in some compromise with its ability to defeat larger caliber rockets. System architectures allow for some ability to task force tailor. Additional launchers can be assigned to a battery or platoon to attain sufficient mass to defeat anticipated heavy attack scenarios. SHORAD systems at battery and platoon can also accept augmentation of sensors. Patriot requires one, and only one, radar per battery. Thus, if one radar is insufficient in accordance with METT-TC, an additional battery must be incorporated into the defense. Unique C2 capabilities and data link architectures within each of the systems limit task force tailoring across systems.

AGILITY

1-27. "Agility is the ability of friendly forces to react faster than the enemy" (ADP 3-90). Automated battle management aids in ADA systems enable operators to execute engagements in a timely manner within the planned defense design and its branches and sequels. Dynamic replanning to respond to unanticipated enemy avenues of ingress, however, is less responsive primarily due to system centric architectures that do not allow cross-leveling of resources across ADA systems.

AMD EMPLOYMENT TENETS

1-28. While commanders should always start AMD employment planning by applying the principles described above, they should also strive to adhere to employment tenets (desirable attributes) when planning and positioning their ADA resources. A tenet is a belief, dogma, or doctrine generally held to be true. The AMD employment tenets are mutual support, overlapping fires and coverage, balanced fires, weighted coverage, early engagement, defense in depth, and resilience.

1-29. The application of a specific tenet or tenets is METT-TC dependent. In some cases, the application of one tenet may only be achieved at the expense of another, as noted below.

MUTUAL SUPPORT

1-30. Weapons are positioned so that the fires of one weapon can engage targets within the dead zone of the adjacent weapon. For guns, this dead zone is usually small. For missiles, the dead zone may be large, and mutual support is a critical element. Mutual support can also cover nonoperational weapons or weapons at lower states of readiness. Mutual support, when applied to sensors has the same connotation; that is, sensors are deployed to cover the dead zone of adjacent sensors. The application of sensor mutual support is challenging due to the need to pair weapons and sensors by system and the scarcity of ADA systems.

OVERLAPPING FIRES AND OVERLAPPING COVERAGE

1-31. Weapons are positioned so that their engagement envelopes overlap. Because of the many altitudes and ranges from which the enemy can attack or conduct surveillance operations, defense planners must apply mutual supporting and overlapping fires vertically and horizontally. Overlapping coverage is the positioning of sensors such that their coverage does not leave any seam in the defense that might be used by ingressing threats. Overlapping fires and overlapping coverage should be planned during defense design. Achieving overlapping coverage against ballistic threats is a challenge because of the need to orient primary target lines toward ballistic launch zones and the system architectures that require system-specific sensors to support system-specific weapons. Overlapping coverage against low altitude non-ballistic threats is challenged by terrain impacts on ground-based sensor visibility and the aforementioned system-specific limitations.

BALANCED FIRES

1-32. Weapons are positioned to deliver an equal volume of fires in all directions. This is necessary for AMD in an area where the terrain does not canalize the threat or when the avenues of approach are unpredictable. Against cruise missiles and other non-ballistic missile threats, balanced fires is a desired characteristic of defense design.

WEIGHTED COVERAGE

1-33. Weapons coverage is combined and concentrated toward the most likely threat air avenues of approach or direction of attack. Based on the tactical situation, a commander may risk leaving one direction of attack unprotected or lightly protected to weight coverage toward another direction. Weighted coverage is generally desirable when designing defenses to defeat ballistic threats. Weighted coverage and balanced fires are not mutually achievable, requiring the defense designer to give up most aspects of one to achieve the other.

EARLY ENGAGEMENT

1-34. Sensors and weapons are positioned so they can engage the threat before ordnance release or friendly target acquisition. Early engagements enable destruction of enemy platforms over enemy forces and unoccupied areas, thereby reducing the possibility of friendly collateral damage and fratricide. As with weighted coverage, early engagement is achieved at the expense of balanced fires.

DEFENSE IN DEPTH

1-35. Sensors and weapons are positioned so that the threat is exposed to a continuously increasing volume of fire as it approaches the friendly protected asset or force. Defense in depth decreases the probability that attacking missiles, aircraft, or RAM will reach the defended asset or force.

RESILIENCE

1-36. ***Resilience*** **is the quality of the defense to maintain continuity of operations regardless of changes in or unanticipated tactics by enemy air or losses of critical air and missile defense components.** ADA planners must understand the capabilities of the system(s) that are being deployed in a defense design, and plan for deployment and employment of components to enable these capabilities to be exploited during mission execution. Resilience is a key determinant when considering which tenet (or tenets) to use in in maintaining the defense.

ADA OPERATIONS

1-37. Unified action (joint) operations entail the participation of the appropriate joint forces operating as a cohesive team. AMD is an inherent function in joint operations, requiring the interdependent capabilities of each service's AMD component.

1-38. The ADA force is the primary land-based contributor to AMD. It executes its role and missions within the context of unified land operations, as discussed below.

ADA IN SUPPORT OF UNIFIED ACTION

1-39. "Threats to U.S. and allied interests throughout the world can sometimes only be countered by U.S. forces able to respond to a wide variety of challenges along a conflict continuum that spans from peace to war" (JP 3-0). Within the conflict continuum, the range of military operations extends from military engagement, security cooperation, and deterrence in times of peace, through crisis response and limited contingency operations, to large-scale combat operations in times of war (see FM 3-0 for discussion of these operations). Joint operations constitute the integrated actions of the U.S. armed forces in all of these.

1-40. ADA forces provide concerted defensive capabilities in the air domain and in the littoral areas of the sea domain in support of Army operations. The following paragraphs discuss ADA actions and activities in support of the four broad categories of Army operations: operations to shape, operations to prevent, large-scale ground combat operations (defense and offense), and operations to consolidate gains, all of which ultimately lead to winning.

1-41. Operations to shape. "Operations to shape consist of various long-term military engagements, security operations and deterrence missions, and actions intended to assure friends, build partner capacity and capability, and promote regional stability" (FM 3-0). Army shape operations, though most prevalent in military engagement and security cooperation activities, are executed continuously throughout all of the joint phases. ADA forces help shape operations by supporting the assurance of friends, building partner capacity and capabilities, and promoting regional stability. Shaping actions are generally planned and coordinated at the AAMDC or ADA brigade levels and executed by ADA battalions. AMD is a key capability our joint forces and allies want on the ground to build partner capacity in advance of hostilities. ADA forces build partner capacity through security cooperation activities such as joint air defense exercises, on-going training, and leader development of multinational AMD forces. Partner capacity and capabilities are further enhanced through their procurement of technologically advanced ADA systems and the enrollment of our partners' AMD Soldiers in ADA schools.

1-42. Operations to prevent. Operations to prevent "include all activities to deter an adversary's undesirable actions. They are typically conducted in response to activities that threaten unified action partners and require the deployment or repositioning of credible forces in a theater to demonstrate the willingness to fight if deterrence fails" (FM 3-0). ADA forces are a preeminent means of deterrence in support of the U.S.'s commitment to preserve the peace by providing assurance of protection for our forces and allies. In that regard, ADA forces frequently serve as flexible deterrent options to demonstrate U.S. resolve. Forward stationed ADA units, such as Patriot battalions, THAAD batteries, and AN/TPY-2 forward-based mode radar batteries, further serve as a deterrent to our enemies by dramatically reducing their expectation of success. The deployed ADA forces are generally tailored as task forces with the right sizes and mix of capabilities to deter or, when required, defeat the projected air and missile threats.

1-43. Presence, profile and posture define and describe the means by which ADA units can shape the security environment through physical and visual actions. Both profile and posture address the manner that units, systems, and Soldiers are present. Profile is the degree of presence, both in terms of quantity and quality. In offensive and defensive operations, ADA units can tailor their profiles in the number of forces or effects. Military deception can play a significant role by allowing commanders to make their force appear larger or more substantial than it is or to keep the profile to a minimum. Posture dictates how units or Soldiers appear to others and how they act towards them and is determined by the operational environment. See FM 3-13 for additional information.

1-44. While prevent as discussed above focuses on an overseas theater, operations to prevent for joint AMD forces begin in the homeland. Prevent in the homeland denies an enemy's ability to successfully attack a geopolitical area or installation. Army ground-based midcourse defense (GMD) systems are deployed in the United States to counter potential long-range ballistic missile threats, such as intercontinental ballistic missiles (ICBMs). ADA systems are emplaced in and around Washington D.C. to protect the National Capital Region against air threats. Navy and Air Force elements add capabilities to protect against air and ballistic missile threats.

1-45. Large-scale ground combat operations. "Large-scale combat operations require the execution of multiple tasks synchronized and converged across multiple domains to create opportunities to destroy, dislocate, disintegrate, and isolate enemy forces" (FM 3-0). Army forces conduct decisive action to seize the initiative and dominate the enemy.

1-46. "Joint force commanders (JFC)s strive to achieve air, maritime, space, and cyberspace superiority early to allow the joint force to conduct land operations without prohibitive enemy interference" (FM 3-0). Conditions preceding large-scale ground combat operations vary depending on the threat. Some adversaries possess significant capabilities to employ anti-access and area denial strategies. ADA has a critical role in countering anti-access/area denial activities and assuring access into a given region. The joint warfighting force's ability to conduct force projection is reliant on ADA's ability to provide force protection. When deployed, ADA units will be integrated with joint and multinational AMD forces to improve and extend surveillance and defend land, air, and sea bases that support operations in an anti-access and area-denial environment.

1-47. ADA is a significant enhancer in the battle to achieve air superiority, or at a minimum, maintain air parity throughout large-scale ground combat operations. Large-scale ground combat operations require the employment of a considerable amount of ADA forces to protect the most critical theater assets, as designated by the JFC. An AAMDC will be positioned in the theater of operations to provide overall command of deployed ADA forces. ADA brigades and battalions may be placed in supporting roles to Army corps and divisions in accordance with mission, enemy, terrain and weather, troops and support available, time available, civil considerations (METT-TC) conditions and the JFC's directives. In addition, ADA forces at battery and platoon levels may be deployed with BCTs. See chapters 5 through 10 for further discussion of the roles, capabilities, and AMD operations conducted by the ADA echelons, from the AAMDC to ADA platoon.

1-48. Operations to consolidate gains. *Consolidate gains* are activities to make enduring any temporary operational success and to set the conditions for a sustainable security environment, allowing for a transition of control to other legitimate authorities (ADP 3-0). Consolidation of gains generally signifies a greater focus on security and stability tasks than on combat operations. ADA forces support operations to consolidate gains by maintaining protection of friendly forces and critical assets as areas are secured. ADA formations, in

accordance with the priorities for defense and available assets, may be positioned in corps or division consolidation areas to defend against enemy residual air and missile capabilities. While an enemy may possess few of these capabilities – the majority having been destroyed or disabled during the dominate phase (large-scale ground combat) of an operation, an attack by a single missile may have a catastrophic impact on a maneuver formation, C2 facility, or geopolitical asset.

ADA IN SUPPORT OF UNIFIED LAND OPERATIONS

1-49. Unified land operations apply "landpower as part of unified action to defeat the enemy on land and establish conditions that accomplish the joint force commander's (JFC's) objectives" (ADP 3-0). Within the context of unified land operations, an operational framework is used to describe operations by echelon in time and space for an area of operations and areas of influence or interest. Land force commanders establish close, deep, support, and consolidation areas within their areas of operations to describe the physical arrangement of their forces over time and their forces' respective roles and missions. Figure 1-1 displays ADA organizations overlaid across the areas.

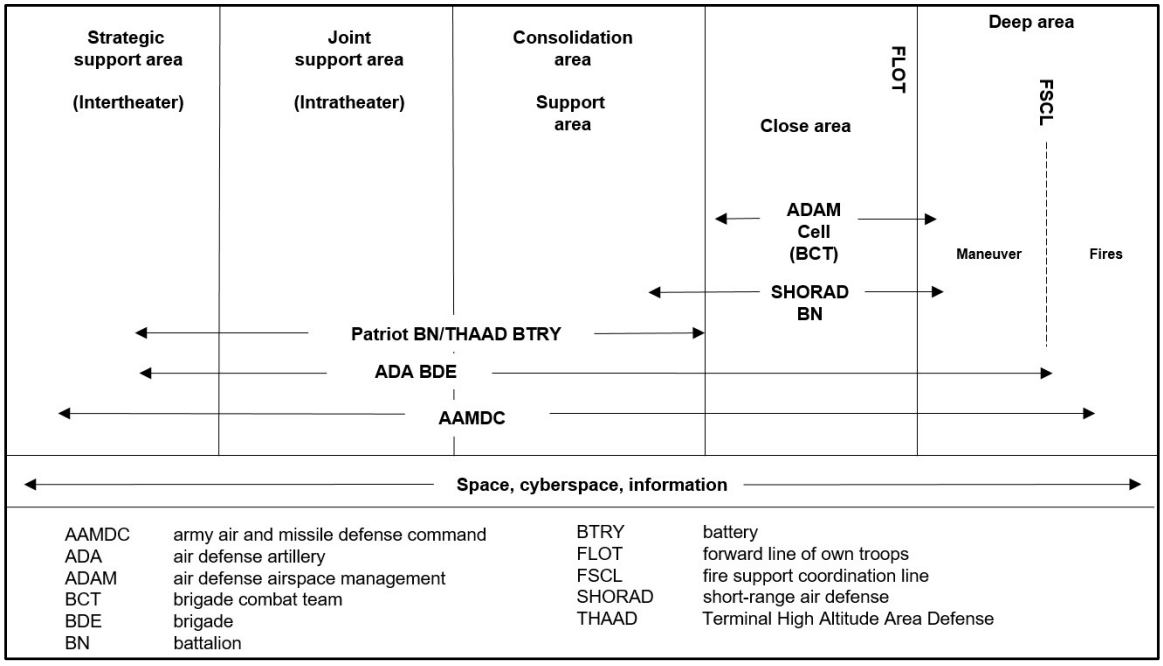

Figure 1-1. ADA echelons in support of a theater of operations

1-50. SHORAD forces are positioned with division or brigade maneuver formations in the close area, where the majority of subordinate maneuver forces conduct close combat. ADAM cell personnel in the BCT plan and coordinate the support of SHORAD or other ADA forces and relay pertinent AMD information and early warning of enemy air activity to maneuver formations. Patriot units may add supplementary protection of the maneuvering forces from their designated locations in the corps or theater areas and/or may be repositioned to sustain coverage. In support of the fight in the corps or theater deep area, the AAMDC or ADA brigade calculate prospective launch areas for ballistic missiles and nominate said areas for subsequent targeting by long-range artillery and aviation assets. The AAMDC and ADA brigade will also assess likely enemy air avenues of approach and missile operating areas from the corps' deep area into the close, support, and consolidation areas and design defenses that are positioned to negate surveillance or attack. ADA forces in the support and consolidation areas provide continuous defense of sustainment facilities and participate in the requisite security and stability tasks. SHORAD forces generally protect assets in the division and brigade areas, while Patriot and THAAD units maintain coverage of assets in the division, corps, and theater areas. See FM 3-0 for additional discussion of the operational framework, its various considerations, and its operational areas.

1-51. The role of ADA forces spans the full range of operations and is a critical enabler in the Army's ability to execute its tasks. ADA forces support Army, joint, and multinational forces in the execution of offensive, defensive, stability, and defense support of civil authorities operations. They facilitate the conduct of decisive and sustainable land operations by Army and other land forces. As with joint operations, the tasks may vary by type of operation and across the strategic, operational, and tactical levels of war. However, irrespective of type operation, ADA forces fundamentally defend friendly forces and other designated critical assets and engage and destroy air and missile threats, ranging from ICBMs to RAM munitions.

1-52. ADA key tasks in support of the defense include:

- Providing AMD coverage of designated critical assets.
- Providing and disseminating early warning to all affected forces.
- Providing situational awareness of the airspace.
- Contributing to engagement information (classification, discrimination, and identification).
- Determining, predicting, and reporting enemy air and missile launch points and impact points.
- Proactively engaging threat air and missile platforms before they attack or surveil.
- Integrating joint and multinational capabilities into the defense design.

1-53. ADA is a key enabler to forces conducting offensive operations. ADA tasks include:

- Providing AMD coverage of maneuver forces and their critical assets, to include denying surveillance by threat air platforms.
- Developing targeting information in support of attack operations.
- Defending forward-based infrastructure, such as lines of communications and command nodes, from air and missile attacks.
- Determining, predicting, and reporting threat air and missile launch points and projected impact points.
- Providing early warning and surveillance.

1-54. ADA key tasks in support of stability operations include:

- Providing forward deployed or forward stationed ADA forces to serve as flexible deterrent options. This is a prelude to unified land operations and serves as an initial condition for shaping operations.
- Supporting security assistance and building partnership capacity efforts through training, education, participation in exercises, and related activities with multinational AMD forces.
- Providing AMD protection for deployed forces and civilian assets and areas from aerial threats, such as RAM attacks.
- Providing or supporting Army-common tasks related to essential governmental services, emergency infrastructure reconstruction, and humanitarian relief efforts.

1-55. ADA key tasks in defense support of civilian authority operations focus on:

- Providing sensor surveillance in support of civilian law enforcement agencies – primarily to U.S. Customs and Border Protection organizations along the U.S. borders. ADA sensors are ideally suited to provide surveillance support to counter-drug operations. Sentinel radars can detect and track low-flying aircraft approaching and penetrating the border.
- Deploying sensors (for example, Sentinel) in support of National security special events and special event assessment rating events, such as the Olympics and Super Bowl.
- Planning for transition to active defense capabilities when properly directed and authorized.

1-56. Fulfilling the ADA role hinges on the ability of ADA forces to conduct effective C2 across both engagement operations and force operations. ***Engagement operations*** **are functions and activities required to execute the air, missile, and counter-surveillance battle.** ***Force operations*** **are actions and functions required to plan, coordinate, prepare for and sustain the total air and missile defense mission.** See paragraphs 2-3 (on page 2-2) through 2-24 (on page 2-6) for additional discussion of force operations and paragraphs 2-25 (on page 2-7) through 2-38 (on page 2-10) for engagement operations.

TRAINING

1-57. The ADA branch requires agile and adaptive Soldiers and Leaders, who are masters of their craft and who are comfortable operating in complex, often ambiguous, environments. Only through an outcome-based training and education system that stresses the development of cognitive skills will this requirement be met.

1-58. The foundation for individual and collective training is the education provided by the Army's institutional education system. Instructors in the various institutional courses introduce, facilitate, or enhance the knowledge of ADA systems, ADA organizations, and AMD operations to resident students. The institutional domain is responsible for providing Soldiers and Leaders with the qualification and preparation for entry into a unit - they teach the ADA competencies.

1-59. Operational force training focuses on collective training conducted at home station, at maneuver combat training centers, during joint exercises, at mobilization centers, and while operationally deployed. Live, virtual, and constructive methods of training are used to attain the desired realism and synchronization of critical tasks across echelons that will facilitate the levels of readiness required to execute wartime missions. ADA Leaders and Soldiers, as individuals and in teams, must be knowledgeable of and capable of executing the actions associated with mission command and C2 – the principles of mission command and the authorizations and directives of Army, joint, and multinational C2 elements, particularly with respect to the AMD kill chain; force operations – planning, coordinating, and sustaining activities for the total AMD mission; and engagement operations – coordinating and executing the engagements of air and missile threats.

1-60. Commanders at all echelons are responsible for ensuring that their units are capable of performing their missions. Commanders cannot delegate this responsibility. Commanders are directly responsible and accountable for all aspects of unit training including the certification/qualification of their individuals, sections, platoons, batteries, and battalions. They understand and employ the principles of unit training and leader development. Through guidance and direction, commanders drive the training management process. They directly observe and participate in the unit's training and leader development to better assess mission readiness and help their subordinates improve. They understand that unit training and leader development are inextricably linked – that good training can develop good leaders, and good leaders are the key to good unit training. They focus the unit's efforts to optimize available time, ensuring their units train the right tasks to meet mission requirements and to support the next higher commander's intent. Each commander determines what essential supporting collective tasks must be trained to attain the required levels of objective training requirements for mission-essential task list proficiency. Commanders look for every opportunity to coach and teach subordinates as they plan, prepare, execute, and assess training, employing the mission command philosophy. They give their subordinate leaders the commander's intent and the resources– including time–to plan, prepare, and conduct the training necessary to develop unit proficiency. Leaders are also trained and educated in the Army Ethic, culture, and character development. They personally create and sustain a positive command climate in their ADA units and organizations. Commander/leader involvement makes a quantitative and qualitative difference in unit training and leader development.

1-61. The proficiencies of individual Soldiers, Leaders, and teams/crews in the operational force are gauged through a certification program. The certification process uses gunnery tables and guidance from higher echelons in the conduct of formal evaluations. In preparation for these periodic formal evaluations, informal assessments are generally conducted by standardization officers at ADA battalions and Leaders at lower echelons. Soldiers and Leaders receive their individual certifications by their units. Teams require certification by the next higher command or a command two levels higher based on the ADA system they use. Re-certification is conducted periodically and is also required if an individual is assigned to a new unit or team, notified of deployment, experiences a major system change to his/her assigned equipment, or as directed by the command. While it is optimal to certify as crews, commanders have the flexibility to retain unit/crew certification as individual crew members rotate in/out, as long as proper evaluation protocols are in place.