Antiair warfare is a U.S. Navy/U.S. Marine Corps term used to indicate that action required to destroy or reduce to an acceptable level the enemy air and missile threat. (Joint Pub [JP] 1-02, Department of Defense Dictionary of Military and Associated Terms) Antiair warfare (AAW) integrates all offensive and defensive actions against enemy aircraft, surface-to-air weapons, and theater missiles into a singular, indivisible set of operations. AAW, along with assault support, offensive air support, air reconnaissance, electronic warfare, and control of aircraft and missiles, is one of the six functions of Marine aviation. AAW is sometimes incorrectly considered an exclusive responsibility of the Marine air-ground task force’s (MAGTF’s) aviation combat element (ACE). Each member of the MAGTF participates directly or indirectly.

AAW serves two purposes: force protection and air superiority. Force protection is those actions taken to guard friendly forces from attack or disruption by enemy forces. In AAW, it concerns those actions taken to defend the MAGTF against enemy air and missile attacks. Air superiority is 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)

Force protection and air superiority are complementary goals of antiair warfare. They provide the MAGTF with defense against enemy air and missile attacks and a reasonable level of confidence so maneuver can be conducted without interference from the enemy’s air and missile capabilities.

Force protection and air superiority actions form a cycle. A strong defense against enemy air attack achieves air superiority. Forces are reasonably protected from enemy air and missile attack. What truly separates force protection from air superiority is how the outcome is achieved.

## Types of Antiair Warfare Operations

In Joint Vision 2010, the Chairman, Joint Chiefs of Staff, highlights full-dimensional protection as one of the four new operational concepts for future joint forces. With the aim of defending forces, Joint Vision 2010 states that this concept will be proactive, incorporating both offensive and defensive actions that may extend well into areas of enemy operations.

Applying this concept to AAW, we see that the intent of AAW is to protect and defend the MAGTF and its battlespace from enemy air and missile attack and take the fight to the enemy. AAW is an enabler for other MAGTF ground, combat service support, and aviation operations. The MAGTF conducts two types of antiair warfare operations: offensive antiair warfare and air defense.

### Offensive Antiair Warfare

Offensive antiair warfare (OAAW) is those operations conducted against enemy air assets and air defense systems before they can be launched or assume an attacking role. OAAW operations in or near the objective area consist mainly of air attacks to destroy or neutralize hostile aircraft, airfields, radars, air defense systems, and supporting areas. Examples of the enemy’s air and missile threat include aircraft, surface-to-air weapons, and theater missiles. To destroy or neutralize the enemy’s air and missile threat, OAAW operations target enemy air capabilities and infrastructure, which include not only the weapons themselves, but launch platforms, airfields, air defense systems, command and control nodes, and support facilities. As OAAW takes the fight to the enemy, it also takes the initiative to gain air superiority while providing robust force protection. See chapter 2.

### Air Defense

Air defense operations include all defensive measures designed to destroy attacking enemy aircraft or missiles in the Earth’s envelope of atmosphere or to nullify or reduce the effectiveness of such attack. (JP 1-02) Air defense consists of active and passive measures to protect our forces against attack from enemy aircraft and missiles.

Active air defense is direct defensive action taken to destroy, nullify, or reduce the effectiveness of hostile air and missile threats against friendly forces and assets. It includes the use of aircraft, air defense weapons, electronic warfare, and other available weapons. (JP 1-02)
Passive air defense includes all measures, other than active air defense, taken to minimize the effectiveness of hostile air action. These measures include deception, dispersion, and using protective construction and camouflage. See chapter 3.

**PRINCIPLES**

The conduct of AAW is based on destruction-in-depth, mutual support, and centralized command and decentralized control. The MAGTF must apply these principles to achieve and preserve force protection and air superiority to accomplish its mission. While these principles are most readily apparent to air defense operations, they apply equally to offensive antiair warfare operations.

**Destruction-in-Depth**

Destruction-in-depth consists of threat detection and destruction that begins as far from the vital area (a designated area or installation to be defended by air defense units) as possible and continues as long as the threat exists. The enemy’s ability to impede the MAGTF’s freedom of operations determines the degree of threat and the depth of destruction.

In air defense operations, the senior commander, e.g., MAGTF, area air defense or joint force, achieves the full impact of destruction-in-depth by integrating all available air defense resources within his zone, area of operations or area of responsibility. The senior commander has the option of dividing the air defense area into sectors and assigning responsibilities for each sector. He then positions assets so that enemy aircraft and missiles encounter an ever increasing volume of fire (both horizontally and vertically) as they approach the vital area, and, if aircraft survive, as they egress.

In OAAW operations, destruction-in-depth may involve an expanding effort to negate the enemy’s ability to deny our aircraft freedom of action. OAAW operations may progress concentrically from our area of operations, concentrate on a particular zone or area or focus along a particular axis into the battlespace controlled by the threat.

**Mutual Support**

Mutual support is support that units provide each other against an enemy. The decision to provide mutual support is based on a unit’s assigned tasks, its position relative to other units and to the enemy, and its inherent capabilities. By employing mutual support, the MAGTF ensures continuous engagement, improves the survivability of AAW assets, decreases the chances of hostile aircraft or missiles penetrating the vital area, and increases the chance of gaining and retaining air superiority.

Units achieve mutual support by integrating, employing, and positioning AAW assets to provide overlapping detection coverage and engagement envelopes. Proper integration, employment, and location of AAW assets ensures that several AAW units have the same assigned target within their range. This integrated and overlapping pattern of mutual support and continuity of engagement reduces degradation of the AAW system that can result from the loss of any AAW asset.

**Centralized Command and Decentralized Control**

The MAGTF commander has overall responsibility for MAGTF aviation operations. He delegates the authority for control, coordination, planning, and supervising MAGTF aviation operations to the ACE commander. Centralized command of AAW promotes coordinated operations and economy of force and aids in integrating all AAW assets into a cohesive AAW capability. Decentralized control allows a shorter decision cycle and enables decisionmaking at the lowest level possible. It minimizes friendly losses and permits subordinate AAW units to react immediately to an air threat unless overruled by higher authority. The MAGTF’s ability to function under centralized command and decentralized control provides it with an integrated air defense system (IADS) that has minimum reaction time, maximum damage resistance, and inherent self-sufficiency.

Although a higher authority may delegate specific authority to subordinate commanders, the higher authority still monitors AAW units’ actions. The higher authority only makes direct target assignments to units for proper fire distribution, maximum efficiency of target engagement, and to prevent engagement of friendly aircraft.
The ACE commander determines the AAW tasks he must personally supervise and then delegates authority for tasks that do not require his attention. When exercising centralized command, the ACE commander delegates authority for control of various Marine aviation functions to MACCS agencies. He normally delegates the authority for AAW operations to his sector antiair warfare coordinator (SAAWC). For effective decentralized control, the ACE commander relies on his SAAWC and subordinate commanders’ judgment and their ability to understand his commander’s intent. See the MCWP 3-25 aviation series for more information.

**THEATER AIR DEFENSE**

Theater air defense is the integrated employment of the joint force commander’s forces to destroy or neutralize enemy offensive aircraft and theater missiles to protect friendly forces or vital interests. It includes the process of theater missile defense (sometimes called theater air and missile defense). Theater air defense is a joint force responsibility, includes offensive and defensive aspects, integrates all joint force air defense assets, and establishes a joint force command structure for its operations. The four operational elements of theater air defense follow.

**Active Air Defense**

Active air defense operations protect against attack by destroying air and missile threats or airborne launch platforms in flight. These operations may include a multi-tiered defense-in-depth against enemy air and missile threats. Air, land, sea, space, and special operations assets conduct active air defense. Active air defense operations also include electronic warfare attack operations that disrupt the enemy’s remote or on-board guidance systems.

**Passive Air Defense**

Passive air defense measures operations reduce the vulnerability and minimize the effects of damage caused by enemy air and missile threats. Passive air defense includes early warning; nuclear, biological, and chemical protection measures; counter-surveillance; deception; camouflage and concealment; hardening; electronic protection; mobility; dispersal; redundancy; recovery; and reconstitution.

**Attack Operations**

Attack operations are offensive operations taken by air, land, sea, space or special operations forces designed to destroy, disrupt or neutralize enemy air and missile threats and communications on the ground or as close to their originating source as possible. Attack operations also destroy, disrupt or neutralize the enemy’s logistics installations that support air operations and reconnaissance, surveillance, and target acquisition platforms. Theater air defense attack operations correspond to offensive antiair warfare.

**Command, Control, Communications, Computers, and Intelligence**

Command, control, communications, computers, and intelligence (C4I) is an integrated system of doctrine, procedures, organizational structures, facilities, communications, computers, and supporting intelligence. It provides command authorities at all levels with timely and accurate data on friendly and enemy theater air defense actions and the data and systems to plan, direct, and control friendly theater air defense operations. C4I includes aircraft and missile warning sensors and ground stations. The MAGTF performs these procedures through the MACCS.

**THREAT LEVELS**

The MAGTF orients on the enemy to determine its strengths and weaknesses. Evaluating enemy aircraft and the missile threat helps determine what is needed to achieve force protection and air superiority. This evaluation is expressed as threat levels.

Threat levels determine the extent of AAW required and may help determine how the MAGTF task-organizes. The threat levels low, medium, and high are general with no clear separation between each level. Levels may overlap or change based on mission, enemy, terrain and weather, troops and support available-time available (METT-T). For example, enemy air defense systems that pose a low or medium threat to one type of aircraft may pose a high threat to another type of aircraft. Likewise, enemy aircraft that pose a high threat to an air command and control agency during daylight hours may be only a low threat to the same platoon during hours of darkness.
Based on current intelligence, determining the threat level helps aircrews, surface-to-air weapons operators, and MACCS operators prepare tactics for a particular situation and environment. Determining threat levels serves as a point of departure for estimating enemy capabilities and should not be used as the singular measure of the degree of AAW means required. The threat is normally characterized as either sophisticated or nonsophisticated, based on the—

- Type, quantity, and quality of individual weapons and weapons systems.
- Command and control systems used to integrate weapons systems.
- Quality of the command.
- Type, quantity, and quality of training.
- Ability to conduct coordinated and sophisticated tactics (multiaxis, diversion, deception, integration of electronic attack).
- Navigation and air-to-ground targeting capability.

**Low Threat**

A low threat level allows MAGTF operations to proceed without prohibitive interference. A low threat environment includes small arms and medium antiaircraft weapons and limited optical acquisition antiaircraft artillery with no integrated fire control systems.

**Medium Threat**

A medium threat level allows acceptable exposure time of friendly aircraft to enemy air defenses or acceptable interference by enemy aircraft to MAGTF operations. This threat level can restrict the MAGTF commander’s flexibility. A medium threat environment has—

- A limited radar or electro-optic acquisition capability that is not supported by a fully integrated fire control system.
- A fully integrated fire control system that is degraded due to terrain, weather or other factors.
- Low-technology theater missile capabilities.

**High Threat**

A high threat level exists when the enemy has an air defense system that includes integrated fire control systems and electronic warfare capabilities. This threat level severely affects the MAGTF’s ability to conduct operations. A high threat environment has—

- Command and control systems.
- Mobile or strategic surface-to-air missiles.
- Early warning radars.
- Electronic warfare systems.
- Integrated air defense/fire control systems.
- Interceptor aircraft.
- Mid- to high-technology theater missile capabilities.

**CAPABILITIES**

The MAGTF has a variety of organic capabilities to conduct AAW operations including aircraft, ground-based air defense weapons, artillery, reconnaissance forces, and air command and control facilities. MAGTF organic AAW capabilities include both lethal and non-lethal means.

Multiple role weapons platforms and equipment suites provide commanders with maximum flexibility. For example, MAGTF fixed-wing aircraft can perform offensive AAW and air defense missions. The F/A-18 can fire a variety of air-to-air missiles, employ high speed antiradiation missiles, and drop ordnance against OAAW targets. Air command and control suites can coordinate and control OAAW and active/passive defense measures.

The MAGTF’s AAW resources are fully capable of integrating with, and in some cases, providing enabling functions for, joint and multinational operations against enemy aircraft and missile threats.

The MAGTF does not possess an organic capability to defend itself against tactical ballistic missiles. Planners must identify those assets that require protection and then work with the other Services’ air defense planners to ensure that MAGTF assets are protected.

With this understanding of the function of AAW and a review of some general capabilities, philosophies, and fundamentals, we can now transition to detailed discussions of how the MAGTF conducts AAW operations. It should be noted that MAGTF AAW operations will rarely, if ever, be the singular source for operations against the enemy’s aircraft and missile threat. It can be expected that all military operations will be joint operations. MAGTF AAW activities will be conducted to support the MAGTF’s single battle concept, but to also meet the needs and objectives of the joint force commander.