
UNITED STATES MARINE CORPS
THE BASIC SCHOOL
MARINE CORPS TRAINING COMMAND
CAMP BARRETT, VIRGINIA 22134-5019

**SIX FUNCTIONS OF
MARINE AVIATION
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STUDENT HANDOUT**

Six Functions of Marine Aviation

Introduction The purpose of this instruction is to provide you with a basic understanding of the six functions of Marine aviation (Offensive Air Support, Anti-Air Warfare, Assault Support, Air Reconnaissance, Electronic Warfare, Control of Aircraft and Missiles) available to support the Marine Air-Ground Task Force (MAGTF).

Importance It is important all Officers understand aviation capabilities provided to the MAGTF commander. Additionally, roughly half of all Marine Officers serve in the Wing.

In This Lesson In this lesson we will discuss the six functions of Marine aviation.

This lesson covers the following topics:

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Learning Objectives

Terminal Learning Objectives:

TBS-AVI-1000 Given an evaluation, define the Six Functions of Marine Aviation without omission.

Enabling Learning Objectives:

TBS-AVI-1000b Given an scenario, identified air assets, and and meet the commanders intent.

TBS-AVI-1000c Given a scenario with identified METT-TC considerations, and identified air assets, incorporate air support into mission planning to accomplish the mission.

Air Reconnaissance

- **Purpose of Air Reconnaissance.** Simply stated, when a commander commits troops to battle, it is done with certain risks. The ultimate purpose of any type of reconnaissance is to reduce the commander's unknown risks. We'll break reconnaissance down into two categories:
 - **Strategic Reconnaissance.** The gathering of information, which is used to affect policy on the national or international level. This information is used by strategic planners and is conducted mostly by National or Theater assets. Some USMC aircraft are utilized in this role to a limited extent, but not as their primary mission.
 - **Tactical Reconnaissance.** Tactical air reconnaissance is the use of air vehicles to obtain information concerning terrain, weather, and the disposition, composition, movement, installations, lines of communications, electronic and communication emissions of enemy forces. Also included are artillery and naval gunfire adjustment, and systematic and random observation of ground battle areas, targets, and/or sectors of airspace.
- **Types of Air Reconnaissance.** The types of air reconnaissance are broken down into three subsections based on the method of collection and distribution:
 - **Visual.** The gathering of information by aircrew by looking through the window of the cockpit, or through a sensor, and verbally passing what is seen to the ground forces. It consists of an observer or pilot visually searching a route, point, or area. This type of reconnaissance is verbal in nature (only provides a word picture) and does not provide any sort of visible imagery. Visual aerial reconnaissance is frequently used in support of the delivery of offensive fires such as artillery support, naval surface fire support, or CAS. Visual reconnaissance is a secondary mission assigned to all USMC aircraft.
 - **Multi-Sensor Imagery.** This involves the passing of imagery from aircraft to ground forces. This can be real-time/near real-time through the use of data (over) feeds from visual sensors to ground forces or can be included as part of a post-mission report where images are attached to a mission report. Multi-sensor imagery reconnaissance is used to detect and pinpoint the location of enemy installations, facilities, and concentrations of forces. It is also used to support terrain analysis.
 - **Electronic.** The gathering of information on how the enemy is utilizing the electromagnetic spectrum. Electronic reconnaissance is used to detect, locate, identify, and evaluate enemy electromagnetic radiation. This can be used for threat warning as well as creating/updating the electronic order of battle.

Anti-Air Warfare

Introduction

From WWI to the present, anti-air warfare (AAW) has been an integral part of Marine Aviation and an essential ingredient to success. Historically this function has been required with varying degrees of intensity depending upon the extent and nature of the enemy air threat. Marine forces have not had to actively counter a meaningful enemy air threat since WWII. Today, however, the sophistication and magnitude of anti-air weapons systems available to even third world countries pose a serious threat to any mission we may be assigned. With this in mind we must understand the function of AAW so that we can apply it against all potential threats. Anti-air warfare (AAW) is the action that is required to destroy or reduce to an acceptable level the enemy air and missile threat. There are two general types of AAW: **Offensive AAW (OAAW)** and **Air Defense**.

- **Offensive Anti-Air Warfare:** OAAW constitutes operations conducted against enemy air or air defense systems before they can launch 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. OAAW objectives include weakening the enemy's offensive air capability to a manageable level, thereby gaining access to a zone of airspace for a specified timeframe to allow friendly air operations and local air superiority in conjunction with friendly operations. These objectives can be incorporated into three specific areas: preemptive measures, suppression of enemy air defenses (SEAD), and local air superiority measures, each with its corresponding objective:
 - **Preemptive Measures.** The objective is to weaken the enemy air threat before the enemy can make effective use of their air defense systems (air-to-air elements, ground-to-air elements, and support command, control, and communications (C3) structure) and prevent attainment of MAGTF objectives. Preemptive measures are required in the early phase of an amphibious operation and in sustained operations ashore. Preemptive measures allow subsequent air and ground operations to proceed without prohibitive interference.
 - **Suppression of Enemy Air Defenses (SEAD).** The objective of SEAD is to gain access to a defined zone of airspace that will allow MAGTF operations to proceed. SEAD may become periodic in nature, applied at a critical time that will allow air and ground forces to proceed without prohibitive interference from the enemy's air defense systems. SEAD is an important part of any campaign and the MAGTF must plan a coordinated effort against the enemy air defense threat. Sustainability of a coordinated GCE/ACE SEAD plan is a function of asset availability.

Anti-Air Warfare (Continued)

- **Local Air Superiority Measures.** Even with successful application of preemptive measures and SEAD, a residual air threat may still exist. This threat may be of such a nature and magnitude that friendly air operations are still possible and survivable with proper application of local air superiority measures. The objective of local air superiority measures is to prevent the enemy's residual air threat from affecting the execution of friendly operations to the point of prohibitive interference in a specific zone of action. Local air superiority measures may be used separately or in conjunction with preemptive measures and SEAD. Local air superiority measures can include the use of offensive combat air patrols, escort and self-escort tactics, and the use of aircraft onboard countermeasures and maneuvers.
- **Air Defense:** Air defense consists of defensive measures designed to destroy attacking enemy aircraft or missiles or to nullify or reduce the effectiveness of such an attack. Air defense can be further broken down into two categories:
 - **Active Air Defense** is direct defensive action taken to destroy attacking enemy aircraft or missiles or to nullify or reduce the effectiveness of such an attack. It includes such measures as the use of aircraft, interceptor missiles, air defense artillery, non-air defense weapons in an air defense role, and electronic countermeasures.
 - **Passive Air Defense** constitutes all measures, other than active air defense, taken to minimize the effects of hostile air action. These measures include the use of cover, concealment, camouflage, deception, dispersion, and protective construction.

The primary purpose of AAW is to gain and maintain AIR SUPERIORITY. 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."

Electronic Warfare

- **Electronic Warfare (EW)** is any military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy. EW consist of the following subsets:
 - **Electronic Warfare Support (ES).** The division of EW involving actions taken under direct control of an operational commander to search for, intercept, identify, and locate sources of radiated electromagnetic energy for the purpose of immediate threat recognition.
 - **Electronic Attack (EA).** The division of EW that involves the use of electromagnetic energy, directed energy, or antiradiation weapons to attack personnel, facilities, or equipment with the intent of degrading, neutralizing, or destroying enemy combat capability.
 - **Electronic Protection (EP).** The division of EW involving actions taken to protect personnel, facilities, and equipment from any effects of friendly or enemy employment of EW that degrade, neutralize, or destroy friendly combat capability.

Offensive Air Support

Introduction

Offensive Air Support (OAS) is defined as those air operations conducted against enemy installations, facilities, and personnel to directly assist the attainment of the Marine Air-Ground Task Force (MAGTF) objectives by the destruction of enemy resources or the isolation of their military force.

- **OAS Functions**

The MAGTF's combat power is enhanced by the concept of combined arms. Combined arms is the full integration of arms in such a way, that in order to counteract one, the enemy must make themselves more vulnerable to another. To accomplish this, a task organized MAGTF will integrate its aviation assets with its organic fire support assets to effectively support the MAGTF scheme of maneuver. OAS operations apply firepower against our opponents' war making and sustaining capabilities. This firepower may be applied for one of two functions: the **destruction** or **neutralization** of the assigned target.

 - **Destruction** missions destroy enemy forces, equipment, supplies, and installations. Destruction of the target may be difficult to achieve contingent upon the threat, target composition, MAGTF aviation assets, and available weapons.

Offensive Air Support (Continued)

- **Neutralization** missions render areas, weapons, or enemy forces ineffective for a specified time. Neutralization may be applied when we cannot afford to dedicate the assets to destroy our opponent, or when we decide that the most efficient application of force would be to "shut them down" for a set period of time, rendering the requirement for destruction unnecessary.
- **OAS Categories.** USMC OAS operations are divided into two major categories: **DAS (Deep Air Support)** and **CAS (Close Air Support)**.
 - **DAS** can be conducted in the form of air interdiction, armed reconnaissance, or strike coordination and reconnaissance (SCAR). The MAGTF commander utilizes DAS to shape the battlefield. DAS is defined as air action against enemy targets at such a distance from friendly forces *that the detailed integration of each mission with fire and movement of friendly forces is not required*.
 - Air Interdiction - operations conducted to destroy, neutralize, or delay the enemy's military potential before it can be brought to bear effectively against friendly forces. This type of operation is a response to a known target that is briefed in advance.
 - Armed Reconnaissance - locating and attacking targets of opportunity (i.e., enemy material, personnel, and facilities) in assigned general areas or along assigned ground communication routes. This type of operation is a response to targets that are not known or briefed in advance.
 - Strike Coordination and Reconnaissance - a mission flown for the purpose of acquiring and reporting deep air support targets and coordinating armed reconnaissance or air interdiction missions on those targets.
 - **CAS** is defined as air action against hostile targets which **are in close proximity to friendly forces and which require detailed integration of each air mission with the fire and movement of those forces**. CAS allows the MAGTF Commander to concentrate firepower at the decisive place and time to achieve local combat superiority. It can be employed in both offensive and defensive operations. CAS can be further broken down into preplanned and immediate missions.
 - Preplanned air support is in accordance with a program and planned in advance of operations. These are either scheduled or on-call. Scheduled missions are executed at a specific time against a specific target at a known location; they provide the most economical use of aircraft and ordnance. On-call missions involve aircraft that are preloaded for a particular target or array of targets and target area and placed in an appropriate ground/air alert status.

Offensive Air Support (Continued)

- Immediate air support meets requests that arise during battle, strike unanticipated targets, and are generally urgent in nature. Aviation assets are diverted from other missions via the MACCS to execute immediate requests. These missions require that those aircraft be re-tasked in air via radio in order to support a different mission.

Assault Support

Introduction

Assault support provides the MAGTF commander the ability to concentrate strengths against selected enemy weaknesses using speed and surprise. It provides operational and tactical mobility as well as logistics support to the MAGTF. The MAGTF commander bases decisions about the extent and use of assault support on the following METT-TC considerations:

- MAGTF's mission and concept of operations.
- The enemy's capability to interrupt movement of assault support assets.
- The effect of terrain and weather on assault support missions.
- Aircraft availability and lift capability.
- Time available for planning, rehearsal and briefing.

The MAGTF commander uses assault support to focus combat power at the decisive place and time to achieve local combat superiority. Using assault support, the commander can rapidly concentrate forces or redeploy those forces as necessary. It allows a commander to apply and sustain combat power and strike the enemy where they are unprepared. This function comprises those actions required for the airlift of personnel, supplies and equipment into or within the battle area by helicopters or fixed wing aircraft. These are the general categories of assault support:

- **Air Logistical Support** - is performed by fixed wing aircraft and delivers troops, equipment and supplies to areas beyond helicopter range and lift capability or when surface transportation is slow or unavailable.
- **Combat Assault Transport** - provides mobility for the MAGTF. It is used to rapidly deploy forces, bypass obstacles or redeploy forces to meet the enemy threat. All of these actions provide the MAGTF commander with more diverse options for operational planning. Combat assault transport allows commanders to affect a rapid force build up at a specific time and place of their choosing.
- **Air Delivery** - the transportation of equipment and supplies to FOBs or remote areas, it can be accomplished with helicopters or loads can be air dropped from fixed-wing aircraft such as the KC-130. Air drops are normally used when surface or helicopter transports cannot be used because of range, closed lines of communications, a lack of adequate airfields, a prohibitive ground tactical situation, high tonnage, or reduced response time.

Assault Support (Continued)

- **Air Evacuation** - This is the transportation of personnel and equipment from a forward operating base or remote areas. This includes flights from areas of operations to secure areas, CASEVAC, extraction of forces, and non-combatant evacuation operations (NEO).
- **Battlefield Illumination** – can be provided by both fixed-wing and rotary-wing aircraft. Illumination may be IR or visible to the naked eye or invisible. Battlefield illumination can last for a few minutes or several hours.
- **Aerial Refueling** - allows MAGTF aircraft, both fixed- and rotary-wing, to conduct flight-ferrying operations, extend time on station, and extend mission range.
- **Tactical Recovery of Aircraft and Personnel (TRAP)** - a subcomponent of combat search and rescue (CSAR) and/or joint combat search and rescue (JCSAR) missions, but it is only executed once the location of survivors is confirmed. It does not involve dedicating aircraft assets to locating survivors. Marine Corps tactical aircraft are not normally equipped to conduct the search portion of CSAR or the over water portion of search and rescue missions. Tactical recovery occurs once the general location of survivors is confirmed. A TRAP mission may include personnel to conduct a local ground search if required. The composition of a tactical recovery mission may vary from a single aircraft and aircrew to an assault support mission package that consists of multiple fixed-wing and rotary-wing aircraft with an onboard compliment of security, ground search, and medical personnel.

Control of Aircraft and Missiles

Introduction

The control of aircraft and missiles integrates the other five functions of Marine aviation by providing the commander with the ability to exercise command and control authority over Marine aviation assets. Control of aircraft and missiles encompasses the coordinated employment of facilities, equipment, communications, procedures, and personnel in order to enable the ACE commander to plan, direct, and control the efforts of the ACE to support the MAGTF.

The agencies of the Marine Air Command and Control System (MACCS) are essential to the conduct of the control of aircraft and missiles. Additionally, although the Tactical Air Control Party (TACP) and other airborne controllers are not part of the administrative chain of the Marine Air Control Group (MACG), they are considered to be integral elements of the MACCS.

Control of Aircraft and Missiles (Continued)

- **Fundamentals of Control of Aircraft and Missiles**
 - The Aviation Combat Element (ACE) Commander's ability to command and control is facilitated through the MACCS. The MACCS provides the ACE Commander with the means to move and process information to effect the decision and execution cycle. The principle objectives of the MACCS are to:
 1. Enhance unity of effort.
 2. Integrate the elements of the command and control system.
 3. Disseminate common situational awareness.
 - The MACCS fulfills these primary objectives through execution of the control of aircraft and missiles function of Marine aviation. The control of aircraft and missiles function *integrates* and focuses the other five functions of Marine aviation into a coordinated effort.
- **Functions.** At its most basic, Control of Aircraft and Missiles provides the following two functions:
 - **Air Direction.** Air direction is the authority to regulate the employment of air resources, including both aircraft and surface-to-air weapons, to maintain a balance between their availability and the priorities assigned for their use. The purpose of air direction is to achieve a balance between the MAGTF's finite aviation resources and the accomplishment of the ACE mission. Air direction includes developing air tasking orders, processing air support requests, collecting information concerning mission status, and changing or altering prescheduled missions.
 - **Air Control.** Air control is the authority to direct the physical maneuver of aircraft in flight or to direct an aircraft or surface-to-air weapon unit to engage a specific target. Air control includes airspace management and airspace control which involves the coordination, integration and regulation of the use of airspace of defined dimensions and the positive identification, tracking, and direction of aircraft within a particular airspace through positive and procedural control.

References

Reference Number	Reference Title
MCWP 3-2	Aviation Operations
MCWP 3-11.4	Helicopterborne Operations
JP 3-09.3	Joint Tactics, Techniques, and Procedures for Close Air Support (CAS)

Glossary of Terms and Acronyms

Term or Acronym	Definition or Identification
AAW	Anti-Air Warfare
ACE	Air Combat Element
ATO	Air Tasking Order
C2W	Command and Control Warfare
C3	Command, Control, and Communications
CAS	Close Air Support
DAS	Deep Air Support
DASC	Direct Air Support Center
EA	Electronic Attack
EP	Electronic Protection
ES	Electronic Warfare Support
Forward Air Controller (Airborne)	FAC(A)
FSCL	Fire Support Coordination Line
GCE	Ground Combat Element
IFF	Identification Friend or Foe
LAAD	Low Altitude Air Defense
MACCS	Marine Air Command and Control System
MACG	Marine Air Control Group
MACS	Marine Air Control Squadron
MAGTF	Marine Air-Ground Task Force
MASS	Marine Air Support Squadron
MTACS	Marine Tactical Air Command Squadron
MWCS	Marine Wing Communication Squadron
OAAW	Offensive Anti-Air Warfare
OAS	Offensive Air Support
SCAR	Strike Coordination and Reconnaissance
SEAD	Suppression of Enemy Air Defense
TACC	Tactical Air Control Center
TACP	Tactical Air Control Party
TAOC	Tactical Air Operations Center
TRAP	Tactical Recovery of Aircraft and Personnel
UAS	Unmanned Aircraft System
VMU	Fixed Wing Marine Unmanned Squadron
