CHAPTER 5. OPERATIONS

The Marine Corps' warfighting philosophy emphasizes an integrated combined-arms approach that employs rapid, flexible maneuver. Maneuver warfare seeks to shatter the enemy's cohesion through a variety of rapid, focused, and unexpected actions to gain a relative advantage. The advantage can be positional, temporal or psychological and creates a turbulent and rapidly deteriorating situation for the enemy.

Marine aviation operates as an integral part of the MAGTF. The ACE is task-organized to specifically provide the MAGTF with the necessary mobility, flexibility, force protection, and fires. OAS, either fixed-wing or rotary-wing aircraft, provides the MAGTF a true combined-arms capability. The MAGTF commander uses his combined arms team to create a dilemma for the enemy. If the enemy counteracts one, the enemy makes himself vulnerable to another. If the enemy cannot move or employ its forces or is unable or unwilling to sustain losses, the enemy's initiative and tempo are lost. For example, a DAS mission is tasked with destroying a C2 facility. This target is collocated with a Fan-Song radar that supports SA-2s (SAM). The target is 450 miles from the forward operating base and requires aerial refueling from KC-130s. As the strike package (AV-8Bs, F/A-18s, and EA-6B) approaches the target area, the Fan-Song radar targets an AV-8B in the strike package. The EA-6B directs jamming and F/A-18s fire HARMs at the Fan-Song radar. The enemy is now faced with a dilemma, continue tracking with the Fan-Song radar to support the launched SAM and have HARMs impact radar, have the Fan-Song radar neutralized by jamming or shut down the radar and be pulverized by precision-guided weapons (PGWs) aimed at the C2 facility.

Both mission requirements and aircraft capabilities will drive the mix of aircraft required to accomplish certain OAS missions. From the example above, the ATO listed the respective units, aircraft, weaponeering, support requirements, and designated the mission commander to accomplish this mission. The KC-130 provided the aerial refueling to get the aircraft to the target; the AV-8Bs destroyed the target with PGWs; and the F/A-18s and EA-6B provided SEAD with HARM and jamming. Appendix B lists different aircraft's capabilities.

This chapter discusses fundamentals in the execution of OAS operations. See MCWP 3-23.1 and MCWP 3-23.2 for detailed information on OAS operations.

INTELLIGENCE SUPPORT

Intelligence provides continuous updated information to OAS operations during planning as well as prior to and during mission execution. These crucial inputs update target development by assessing enemy capabilities, centers of gravity, force dispositions, relationships, intentions, operations, vulnerabilities, defenses, enemy warfighting sustainability, passive defense measures, and possible enemy COA. Intelligence also supports OAS operations by providing environmental assessments (such as effects adverse weather, darkness, and seasonal and temperature effects).

Intelligence through inflight reports and BDA may also provide us with the enemy's location. Certain weapons require very specific target coordinates, such as the JSOW and JDAM, to be effectively employed. These two types of munitions are GPS guided weapons and are only as accurate as their coordinates from the World Geodetic System 1984 (WGS-84) datum. The target location error (TLE) for these individual weapons needs to be within 7.5 meters for JSOW and 7.2 meters for JDAM. The TLE is the combination of linear (elevation) and circular (latitude and longitude) errors combined.

THREAT LEVELS

Threat levels determine OAS feasibility. The three threat levels are low, medium, and high. There is no

clear dividing line between the threat levels. Air defense systems that present a low or medium threat level for one type of aircraft may present a high threat level for another type of aircraft. A medium threat level during the daylight hours may be a low threat level at night.

Current intelligence updates the threat levels for OAS operations. C2 requires accurate and timely intelligence updates to ensure effective OAS execution. A change in threat level may force a DAS mission's risk level to be too unacceptably high without fighter escort or SEAD support. An immediate CAS mission may be better suited for rotary-wing aircraft based on a lower threat level and use of economy of force, as compared to a medium threat and more sorties required if fixed-wing aircraft were utilized.

A change in threat level may also require a change in tactics. For example, an OAS aircraft aborts his target attack due to being targeted by a ZSU 23-4. Other aircraft in the strike package are able to flex from the primary low altitude to a secondary medium altitude target attack to avoid the ZSU 23-4. This change in medium altitude tactics has taken the ZSU 23-4 from a high threat to a low threat. Inversely, however, finding and destroying the target may be more difficult due to the increase in altitude making target acquisition more difficult and increasing weapon's ballistic error.

Threat levels alone do not determine if an OAS mission should be flown. See *Air Force Tactics, Techniques, and Procedures* (AFTTP) 3-1, for a discussion of threat air defense assessment and planning.

- A low threat level allows OAS operations to proceed without prohibitive interference. Aircrews are free to select tactics that ensure effective use of weapons systems and ordnance. A low threat implies that a sanctuary exists from which aircrew can operate. This can be a vertical sanctuary from which aviation assets can operate above the threat or a lateral sanctuary from which aircraft can operate using standoff.
- A medium threat level allows acceptable exposure time of friendly aircraft to enemy air defenses. This threat level can restrict OAS flexibility in the immediate target/objective area.
- 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 ability to conduct OAS operations. In a high threat environment, aircraft are exposed to the threat throughout their time of flight in the target area.

SUPPORT REQUIREMENTS

The ACE is tasked with providing MAGTF operations with the six functions of Marine aviation. Both mission requirements and aircraft capabilities will drive the types and numbers of aircraft required to accomplish OAS missions. During OAS operations, aircraft may be tasked in direct support of AI missions or to provide an airborne alert in a general support role for CAS and AR missions. Aircrews, as well as commanders and tactical air controllers, need to know how support requirements affect the performance of OAS missions. Mission planning identifies the threats and support requirements for OAS operations. Support requirements are tasked through the ATO and executed by the TACC. The TACC provides functional interface for employment of MAGTF aviation with joint and multinational support assets. Support requirements during OAS operations can consist of the following.

Fighter Escort

Since there is no way intelligence can predict where or when enemy fighters may attack, fighter escort aircraft provide protection for OAS missions. Fighter escort aircraft provide prestrike sweeps, close escort, and combat air patrols.

Prestrike sweeps clear a path free from enemy fighters through the target area for the OAS aircraft. The range at which the prestrike sweep is in front of OAS aircraft is dependent on the threat and commander's guidance.

Close escort fighters maintain contact with OAS aircraft. This type of escort provides better situation awareness for both fighters and OAS aircraft as to each other's location, as well as the threat's position relative to them, in the battlespace.

Combat air patrols (CAPs) provide OAS aircraft a fighter escort, normally from a roving or fixed location

in the battlespace. The CAP is positioned to act as a barrier between OAS aircraft and enemy fighters.

Classified tactical manuals contain the strengths and weaknesses when utilizing these different types of fighter escort tactics when performing OAS operations. The following are employment considerations.

Offensive Air Support Aircraft Self-Defense Capability

Although many of today's OAS aircraft have a self-defense capability, providing a fighter escort will allow more time for OAS aircrew to concentrate on air-to-ground tactics, while the fighter escort aircraft focus on sanitizing the battlespace for air-to-air threats. When OAS aircraft provide their own self-defense, they are typically less effective due to higher fuel consumption rates, decreased maneuverability, and reduced air-to-air ordnance loads while carrying air-to-ground ordnance.

Enemy Surveillance Capability

Close escort aircraft may highlight the position of the strike package; however, they have better situational awareness on OAS aircraft. A prestrike sweep may provide an early warning to enemy air defenses but may divert the enemy fighters away from OAS aircraft.

Enemy Air Defenses

If OAS aircraft are exposed to enemy air defense systems, it is more than likely that the fighter escort aircraft may be exposed to the same threat. SEAD support may only be sufficient to provide OAS aircraft protection from the threat.

Rules of Engagement

ROE may limit or prohibit the circumstances under which beyond visual range (BVR) missiles may be employed against enemy aircraft. Under very restrictive ROE, mission commanders and planners need to weigh the advantages and disadvantages of having a prestrike sweep or close escort to provide fighter support.

Electronic Warfare

EW aircraft protect OAS aircraft through electronic jamming and deception. Electronic jamming denies or disrupts the enemy's ability to detect or track OAS aircraft electronically. Electronic deception sends misleading information about the OAS aircraft's speed, altitude, size, and direction.

EW requires detailed integration and coordination to protect OAS aircraft exposed to enemy threat air defenses. AI is typically the only OAS mission where detailed mission planning and coordination are conducted between EW and OAS aircrew. During CAS, AR, and SCAR missions, EW aircraft may be tasked with an airborne alert to provide on-call or reactive EW support for OAS aircraft.

The following are some considerations for EW support during OAS operations:

- Preemptive EW is superior to reactive EW.
- Tactics and electronic countermeasures for unanticipated threats.
- Tactics and standing operating procedures to simplify EW coordination in OAS mission's other than AI.
- The length of time EW support is available for OAS aircraft.
- Enemy fighters capability to degrade EW support.
- EW interference with communication, aircraft weapon systems and EW suites, and weapons.

Suppression of Enemy Air Defenses

SEAD reduces attrition of OAS aircraft by degrading the effectiveness of enemy air defense systems. SEAD uses supporting arms (i.e., artillery, naval gunfire, J-weapons, and aircraft) and other available means (i.e., GCE or EW) to deter, suppress, or destroy the enemy. SEAD is integrated with not only OAS aircraft, but also supporting aircraft during OAS missions. SEAD aircraft integrated into OAS missions may be enough to change the enemy's normal air defense operating procedures. HARMs and antiradiation missiles (ARM) can suppress or destroy radar sites. The following are some SEAD fundamentals required to support OAS aircraft:

- SEAD effects are short-lived, and OAS aircraft need to minimize their time exposed to enemy air defenses.
- Adhere to OAS aircraft's routing of flight and timing to maximize SEAD effects.

- SEAD is a suppression tactic not a destruction tactic for enemy air defenses.
- Preemptive SEAD provides the best protection for OAS aircraft.
- Limited SEAD weapons may require reactive SEAD tactics.

Tankers

OAS support requirements depend upon the mission. Aerial tankers are required when targets and operating areas are far from the OAS operating bases. Tankers may also be required to provide an airborne alert in support of OAS missions.

Reconnaissance

Reconnaissance can provide BDA and target locations for OAS missions. It may satisfy requests for information (RFIs), intelligence requirements pertaining to targets, target areas, threat capabilities, terrain, and weather.

Deception

Deception techniques can be used against enemy radars, communications intelligence (COMINT) sites, and other enemy assets. Effectively executed deception tactics draw the enemy's interest and forces away from OAS aircraft and its intended target area. Some deception techniques are listed below:

- Chaff corridor to deny enemy radar operator's coverage.
- EW techniques to present false targets to enemy radars.
- Use aircraft to make misleading transmissions to deceive enemy COMINT sites.
- Decoy aircraft or drones are used to pose a threat from a different direction than the actual threat.
- Preemptive changes in altitude and heading to avoid enemy air defenses.

Confusion

Confusion can deny or delay the enemy's ability to analyze the OAS threat and to take appropriate action. OAS aircraft use EW, chaff, aircraft maneuvering, deception, and concurrent ground operations to mask OAS objectives.

Operations Security

The less information the enemy has concerning OAS operations, the easier it is to conduct successful deception and confusion. Operations security (OPSEC) may be compromised by the use of the following:

- Radios, radars, radar altimeters or other emissions.
- Flight profiles which place OAS aircraft in enemy search or early warning radar coverage areas.
- The inability for OAS aircraft to use secure voice communication capabilities.
- Predictable flight profiles which place OAS aircraft in danger of enemy air defense systems.

Support requirements can greatly affect the success of any OAS mission. These supporting elements allow OAS aircraft to arrive in the target area and safely return to base. Supporting elements degrade the enemy's air defense capability and reduce the number of aircraft exposed to the threat. They also enhance aircrew's target acquisition, ordnance delivery accuracy, and target area tactics.

The combination of OAS aircraft and support aircraft requires close coordination to be effective. AI missions may have the luxury of detailed planning and coordination prior to the execution of their mission; however, SCAR, AR, and CAS missions are more than likely going to have to coordinate airborne, relying on tactical procedures or SOPs to suppress or destroy the enemy's air defense threat.

CAPABILITIES AND LIMITATIONS

OAS is an integral part of the MAGTF combined arms team. The MAGTF performs OAS missions during day, night, and all-weather conditions. Dependence on OAS increases when—

- Targets are beyond the range of other supporting arms.
- Air attack is more appropriate.
- Other supporting arms are not available.

An aircraft's capability to perform OAS is determined by the aircraft's weapon systems and ordnance load. By matching the best aircraft and ordnance capable of destroying, delaying, disrupting or diverting the enemy forces, economy of force is ensured in MAGTF operations. One aircraft may have a far superior onboard weapon systems capability to detect enemy forces; however, it may not have the best ordnance load for the desired effects against the enemy.

The following is an example of using economy of force to determine which aircraft is best suited to accept an immediate CAS mission against a convoy of enemy armored personnel carriers (APCs). The DASC has two sections on station, one section of F/A-18s and one section of AH-1Ws. Both sections have checked in "as fragged" from the ATO. The ATO tasked the F/A-18 section to be loaded with MK-82s and the section of AH-1Ws to be loaded with PGMs. By matching the appropriate ordnance load to the target, the section with PGMs would be the first choice due to this type of ordnance being better suited against armored vehicles.

Sometimes the best aircraft weapon system or ordnance load will not be available for immediate employment in CAS or AR against time sensitive targets. However, from the example above, if all that was available was a section of F/A-18s with MK-82's, the enemy may still be disrupted, neutralized or delayed in support of the ground commander's scheme of maneuver or MAGTF commander's targeting priorities for AR missions.

C2 seeks to optimize the use of limited OAS assets to meet the commander's objectives. See appendix A and appendix B for more information.

Capabilities

OAS's principal advantage is the ability to attack targets other supporting arms cannot. Aircraft deliver great destructive power and can neutralize or destroy heavily fortified positions and point targets. OAS offers the following capabilities.

Variety of Attack

Aircraft can perform a variety of attacks. This allows aircrews to perform attacks suited for target acquisition and employment of ordnance against the target. An aircraft's ability to attack a target from any direction increases OAS flexibility. Aircraft can carry a wide variety of ordnance, allowing them to neutralize targets that interfere with MAGTF operations.

Observation

Aircrews performing OAS missions can observe large areas and relay information concerning enemy activity in areas hidden from ground observation. This capability aids MAGTF units in locating the enemy. An OAS aircrews' ability to find, observe, and attack the enemy is a significant advantage over other firepower systems.

Responsiveness

An aircraft's ability to mass rapidly at the desired point provides surprise, shock, and violence out of proportion to actual numbers. Aircraft can concentrate in the objective area from dispersed locations, allowing a commander to bring overwhelming firepower to bear on the enemy. Diverting OAS aircraft from one mission to another allows the MAGTF to take advantage of fleeting battlefield opportunities.

Flexibility

Aircraft control is highly flexible. FACs or FAC(A)s can provide terminal control of OAS missions. If required, control can shift from one agency to another. Aviation's ability to integrate with other supporting arms enhances the MAGTF's combined arms options.

Radius of Action

Aircraft can operate from forward operating bases (FOBs), aircraft carriers or amphibious platforms. Inflight refueling, rapid ground refueling or forward arming and refueling point (FARP) operations extend the normal combat radius of support aircraft.

Firepower and Mobility

Aircraft firepower and mobility permit a wide spectrum of attacks. Attacks can range from a single aircraft against many targets to many aircraft against a single, vital target. Independence from terrain obstacles, such as rivers, hills, etc., and speed provide aircraft with a mobility advantage over surface-borne supporting arms.

Accuracy

Modern aircraft systems and weapons allow accurate location and delivery of firepower. Flight computers, precision navigation equipment, and other aircraft sys-

tems allow accurate delivery of unguided ordnance. Precision-guided weapons (laser-guided weapons, electro-optical-guided weapons, and GPS-guided weapons) allow for pinpoint accuracy. Accuracy allows aircraft to attack moving targets and targets close to friendly troops without endangering personnel. The ability to locate and deliver accurate firepower greatly reduces the number of aircraft and sorties required to neutralize or destroy a target.

Availability

Aviation should provide the maximum number of aircraft required to support MAGTF operations. Maintaining aircraft in an alert status during the assault permits parts or all of an aviation unit to be directed against a critical target with minimum delay. Availability also depends on basing considerations (seabasing, FOB operations) and location.

Morale Factor

Aircraft can improve the morale of friendly troops and destroy the morale of enemy forces. The MAGTF commander should exploit the psychological effects of OAS efforts to greatly reduce the will of enemy forces to continue, especially when faced with the prospects of having to also defend against subsequent maneuver operations.

Limitations

OAS limitations must be considered during operations to maximize its effectiveness. The following are some considerations specific to OAS.

Limited Visibility

Darkness and periods of limited visibility (smoke, haze, sunrise, and sunset) present the greatest limitations to OAS. FLIR, radar, NVDs, and GPS are available, but cannot duplicate unlimited visibility and daylight conditions.

Weather

Weather may drive a typical low threat-level mission to a high threat-level mission. Weather is a limiting factor that many commanders have overlooked in past history. OAS needs favorable weather for proper, efficient, and safe execution. The true all-weather capability that OAS aircraft provide to the MAGTF commander may be limited to AI missions due to GPS-guided weapons being the only viable ordnance employment opportunity. CAS, AR, and SCAR may be prohibited for days due to poor weather conditions. Weather can inhibit aircrews' ability to positively identify targets, employ ordnance or avoid terrain.

Target Identification

Target identification, especially targets close to friendly forces, is one of the most difficult problems for OAS aircrews. Targets must be identified visually, with maps, aerial imagery, aircraft sensors or systems (FLIR, radar, NVDs, laser), accurate target coordinates and elevation (GPS-guided weapons) or accurate target description (talk-on). Use of target marking will enhance rapid and positive target identification.

Time On Station

An aircraft's time on station depends on many factors (e.g., distance from base to target area, fuel consumption, ordnance load, fuel reserves). Aircraft operating at low altitude burn more fuel, so in an attempt to reduce fuel use and increase time on station, aircraft may orbit or hold at high altitudes (dependent on threat level) or conserve fuel by landing or ground turning if required (rotary-wing) while awaiting a mission.

Radius of Action

Fuel on board limits radius of action. Increasing the ordnance load beyond a certain point reduces the amount of fuel an aircraft is able to carry. Refueling, while airborne or at FOBs, reduces this limitation but requires additional coordination and logistical support.

Communications

Coordination of OAS missions with the fire and maneuver of MAGTF forces requires reliable, secure, and redundant radio communications. Real-time information is crucial and cannot be overemphasized. Without prompt and accurate information, OAS missions may not achieve the desired effect on the enemy.

Resources

Aircraft and aircrew need turnaround time for OAS missions. This time includes the requirement to get intelligence updates, brief, coordinate with other units, aircraft turnaround (refuel, load ordnance, and service), and crew rest. As a general rule, it typically takes about one squadron worth of aircrew and aircraft to perform a 24-hour mission, assuming that the mission only requires a section (two) of aircraft on station at any given time.

Enemy Defenses

Enemy defenses can affect the range and effectiveness of OAS missions due to additional fuel requirements and support aircraft required for self-defense. SEAD may be required against enemy SAMs and AAA. A prestrike sweep, combat air patrol (CAP), or close escort of fighters may be required against enemy fighters.

REACTIVE WEAPONEERING

Precise planning has always been a critical part of any attack mission, but such planning takes time that is normally in short supply. During OAS operations FACs, FAC(A)s, and aircrew may have to quickly react to exploit success on the battlefield.

Reactive weaponeering improves the air-delivered ordnance effectiveness during CAS and AR missions. Generally, weaponeering for CAS and AR is not tailored for a specific target but is designed based on the effectiveness against a variety of target sets. OAS aircraft may be tasked with SCLs listed in the ATO in anticipation of certain target sets they are likely to engage in the battlespace. The overall objective of reactive weaponeering is to optimize the use of air-delivered ordnance, minimize effort and exposure to the threat, and maximize target destruction.

TACTICS

OAS missions revolve around en route, ingress, attack, and egress tactics. These tactics are dependent upon several conditions (e.g., weather, threat, visibility, range, timing, terrain, night). During the execution of OAS operations, the mission commander or flight leads may determine it is more beneficial to change the game plan or alter tactics to increase the probability for mission success.

En Route

En route tactics can be high, medium or low altitude. The tactical considerations as to which altitude should be flown depend on the enemy's air defense capability, range, weather, enemy radar detection, aircrew's workload, and radio communication, etc. En route tactics are normally associated when aircraft cross the forward edge of the battle area (FEBA) until they arrive at the contact point.

Ingress

Ingress tactics apply from arrival at the contact point or until the target attack phase begins at the initial point. Ingress tactics take into account the same considerations as en route tactics. Timing, easily identifiable terrain and cultural features, and navigational update points are other essential concerns for easing the transition from the en route phase to the attack phase.

Attack

Attack tactics for OAS missions are typically the phase that encompasses the initial point or battle position to munitions impacting the target. Attack tactics vary according to the type of OAS aircraft and type of airborne ordnance being employed. Tactics range from low altitude pops, medium altitude dive deliveries, and high altitude level deliveries for fixed-wing aircraft, and hover and fire from battle positions for rotary-wing aircraft. The overriding factor that drives attack tactics is target acquisition. If aircrews are unable to identify the target, either positively or through reasonable assurance, they will not be able neutralize or destroy the target. More discussion on GPS-guided weapons (JDAM and JSOW) and future employment considerations is in chapter 6. Other factors that will affect attack tactics are terrain, weather, enemy air defense capabilities, and visibility, etc.

Egress

Egress tactics reduce OAS aircraft exposure to enemy air defenses and provide for mutual support between elements. Egress tactics deny engagements by enemy air defenses and provide self-defense capabilities, and mutual support between formations through hostile territory. Other factors that will affect egress tactics are terrain, weather, enemy air defense capabilities, visibility, etc. More information on OAS tactics are detailed in the MCWP 3-23.1, MCWP 3-23.2, individual aircraft tactical manuals, and *Strike Leader Attack Training Syllabus* (SLATS) Notebook.

DEEP AIR SUPPORT

DAS allows the MAGTF commander to shape the battlespace. DAS disrupts the enemy's operational cycle, forces premature deployment of forces, and denies sanctuary. It also may delay enemy reinforcements; degrade critical enemy functions or capabilities (C2, air support, logistic); manipulate enemy perceptions; attack enemy formations, lines of communications, and C2 centers. By itself, DAS is ineffective. DAS is effective when integrated with other MAGTF operations that force the enemy to accelerate the consumption of his essential resources and forces him out of his observe, orient, decide, act; observation, orientation, decision, action (OODA) loop. The following are considerations during DAS execution:

- Timing. A common reference time is essential for accomplishing the high degree of coordination necessary for effective DAS, especially when conducting AI missions.
- Security. Standard cryptologic and authentication procedures are contained in the OPORD, ATO, and SPINS. These procedures ensure the safe conduct of DAS operations.
- Check-in. Check-in procedures establish the required flow of information between aircrews and control agencies.
- Deconfliction. DAS missions are deconflicted through positive and procedural controls. Armed reconnaissance areas (ARAs), minimum-risk routes (MRRs), and timing and target areas are a few methods for deconflicting aircraft in the AO.
- Target marking. Although not required for DAS missions, SCAR platforms may be able to mark targets or verbally "talk-on" AR aircraft onto targets. This will expedite both target acquisition and aircraft attacking the target.
- Attack control. The approval to deliver airborne munitions during DAS missions from the supported FSCC is not required, obtained prior to takeoff or in some cases obtained prior to entering the controlling FSCC's AOR. SCAR platforms are not qualified FAC(A)s and, therefore, do not issue clearance to drop/fire. Positive identification or reasonable assurance is required guidance for aircrews to deliver ordnance.
- BDA. Accurate BDA is critical for determining if targets should be reattacked and also updates the enemy order of battle.
- Night/limited visibility DAS. Aircrew require a high degree of proficiency when conducting DAS under night or adverse weather conditions. These conditions depend heavily on systems and sensors. There are three general categories of night/limited-visibility employment:
  - Visual employment must rely on lower ambient light conditions, battlefield fires or artificial illumination to successfully target attacks.
  - System-aided relies on radar, laser, FLIR, and television (TV) systems for target acquisition during night and in adverse weather conditions.
  - NVDs allow aircrew to detect and attack targets at night.
- DAS with laser-guided systems. Laser-guided systems provide the MAGTF with the ability to locate and engage high-priority targets with an increased first-round hit probability. While laser-guided systems provide additional capabilities, they do have distinct limitations.

For additional information on DAS operations, see MCWP 3-23.2.

CLOSE AIR SUPPORT

CAS provides the MAGTF with flexible, responsive fire support and is able to accurately employ a wide range of weapons. CAS can surprise the enemy and create opportunities for the maneuver or advancement of ground forces. CAS is equally suited to support offensive and defensive operations to include MOOTW. More importantly, CAS may at times be the only supporting arm available to the commander. The following are considerations during CAS execution:

- Timing. A common reference time is essential for accomplishing the high degree of coordination necessary for effective CAS.
- Security. Standard cryptologic and authentication procedures are contained in the OPORD, ATO, and SPINS. These procedures ensure the safe conduct of CAS operations.

- Check-in. Check-in procedures establish the required flow of information between aircrew and control agencies.
- CAS briefing form. This form is better known as the "nine-line brief." It is the U.S. standard brief for all aircraft conducting CAS. The NATO CAS briefing consists of a ten-line briefing format.
- Target marking. The aircrews ability to locate the target is aided by the supporting units ability to mark the target.
- Final attack control. Terminal controllers provide the following functions during the final attack:
  - Corrections from the mark to locate the target.
  - Clearance to drop/fire.
  - Reasonable assurance.
  - Reattacks.
  - Abort procedures.
- BDA. Accurate BDA is critical for determining if targets should be reattacked and also updates the enemy order of battle.
- Night/limited visibility CAS. Terminal controllers and aircrew require a high degree of proficiency when conducting CAS under night or adverse weather conditions. These conditions depend heavily on systems and sensors. There are three general categories of night/limited-visibility employment:
  - Visual employment must rely on lower ambient light conditions, battlefield fires or artificial illumination to successfully attack targets.
  - System-aided relies on radar, laser, FLIR, and TV systems for target acquisition during night and in adverse weather conditions.
  - NVDs allow aircrew to detect and attack targets at night.
- CAS with laser-guided systems. Laser-guided systems provide the MAGTF with the ability to locate and engage high-priority targets with an increased first-round hit probability. While laser-guided systems provide additional capabilities, they do have distinct limitations.

For additional information on CAS operations, see MCWP 3-23.1.

BASING MODES

OAS aircraft may be operationally based in a number of ways. The more traditional basing modes include main operating bases on land and seabasing aboard naval ships afloat. Fixed-base and shipboard deployment generally offers the widest range of available ordnance, mission equipment, logistic support, etc., but these locations are often well removed form the battle area. As a result, aircraft may have farther to fly to reach OAS target areas and have a longer turnaround time between missions. In addition to using main operating bases and ships, aircraft can be deployed to FOBs and FARPs.

Forward deployment of OAS aircraft offers several advantages. Operating from locations close to the battle area can increase loiter time in the objective area, extend effective combat radius, and, perhaps most importantly, make the OAS firepower more responsive to the MAGTF commander by shortening the response time. Preplanned logistic support is vital to ensure that sufficient ammunition, fuel, and servicing equipment are in position and ready for use when needed. FARPs are one method of employing FOBs.

MILITARY OPERATIONS OTHER THAN WAR

Modern military operations are becoming increasingly involved in MOOTW. OAS operations in MOOWT involve situations other than large-scale, sustained military operations. MOOTW focuses on deterring war, resolving conflict, promoting peace, and supporting civil authorities in response to domestic crises. As in war, MOOTW's goals are to achieve national objectives as quickly as possible and to conclude the operations on terms that are favorable to the United States and its allies.

As in all military operations, commanders will focus on a center of gravity in MOOTW. OAS missions will be oriented to exert influence on the center of gravity. The MOOTW environment is unique in that it can transition quickly from combat to noncombat and back

again and often has constraints on the forces, weapons, tactics employed, and the level of violence.

Depending on the environment, mission, and location of MOOTW operations, the degree of control may need to be more rigorous, and the ROE may need to be more restrictive than for higher scale operations. Consequently, in MOOTW environments prone to such dynamic change, all air missions, including both fixed- and rotary-wing of all components, must appear on the appropriate ATO and/or flight plan. In addition, aircraft may have to monitor a common frequency and operate on designated identification, friend or foe (IFF) modes and codes.

Aircraft may operate without an ATO mission number in high-density aircraft environments, such as in a properly designated high-density airspace control zone (HIDACZ) or amphibious objective area published on the ACO. This type of rigorous control is necessary during such MOOTW because the mix of friendly, enemy, and neutral aircraft and mission constraints requires the commander to strictly control flights in the AOR/JOA (i.e., peace operations).

To achieve their objectives in MOOTW, commanders may utilize OAS. See JP 3-07, *Joint Doctrine for Military Operations Other Than War,* for more specific information on different types of MOOTW that are listed below:

- Arms control.
- Combatting terrorism.
- DOD support to counterdrug operations.
- Enforcement of sanctions/maritime intercept operations.
- Enforcing exclusion zones.
- Ensuring freedom of navigation and overflight.
- Humanitarian assistance.
- Military support to civil authorities.
- Nation assistance, support to counterinsurgency.
- Noncombatant evacuation operations.
- Peace operations.
- Protection of shipping.
- Recovery operations.
- Show of force operations.
- Strikes and raids. Support to insurgency.

JOINT AND MULTINATIONAL OPERATIONS

Joint air operations are performed with air capabilities/forces made available by other service components in support of the JFC's operation or campaign objectives or in support of other components of the joint force. The JFC has the authority to exercise operational control, assign missions, direct coordination among subordinate commanders, redirect and organize forces to ensure unity of effort in the accomplishment of the overall mission. The JFACC will use the JFC's guidance and authority in coordination with other assigned or supporting commanders. As a result, the MAGTF in joint and multinational operations may have OAS from both organic USMC direct support capabilities/forces and those capabilities/forces allocated to it by the JFACC.

More information about air support in a joint force can be found in JP 0-2, JP 3-0, JP 3-56.1, JP 3-09, and MCWP 3-25. Marine aviation forces capable of OAS in the joint environment are not exempted from JFC up-front tasking. The JFC may redirect MAGTF sorties for air defense, reconnaissance, long-range AI, as well as for AR or SCAR if the JFC determines that they are required for higher priority missions than for CAS. The JFACC is the supported commander for the JFC's overall AI effort. Detailed information on AI and CAS in the joint environment is contained in JP 3-03, *Doctrine for Joint Interdiction Operations,* JP 3-09.3, *Joint Tactics, Techniques, and Procedures for Close Air Support (CAS),* Air Force Doctrinal Document 2-1.3, *Counterland* (Draft), and JP 3-56.1, *Command and Control for Joint Air Operations.*

OFFENSIVE AIR SUPPORT IN AMPHIBIOUS OPERATIONS

Amphibious Assaults

The principle supporting arms in amphibious operations are aviation, naval gunfire, and artillery. OAS operations needed to support an amphibious assault will be outlined in the air plan annex of the OPLAN. Because amphibious OAS missions are usually in high

demand, the fire support plan should complement the use of aviation, naval gunfire, and artillery fires.

Prior to D-day, OAS will largely be responsible for shaping the battlespace. Missions that OAS aircraft may perform in advance of the amphibious task force landing are neutralization or destruction of enemy forces within the landing area, interdiction of enemy forces capable of interfering with the assault landings, and airborne delivery of mines.

On D-day, OAS aircraft will be the primary supporting arm for the landing force while artillery is moving ashore. Naval gunfire may be limited by its range when employing ship-to-objective maneuver (STOM) tactics from over the horizon. Missions that OAS aircraft may perform on D-day are pre-H-hour neutralization of beaches, drop zones, and helicopter landing zones, preplanned and immediate CAS, SCAR, AR, and AI. Post D-day, OAS operations will most likely consist of CAS missions in support of tactical objectives, and DAS missions that shape the battlespace for subsequent operations.

OAS missions will be from aircraft capable ships when using OMFTS concepts. The air plan will be oriented toward missions that have the aircraft returning to the sea base for turnaround maintenance and crew changes, with the possibility of using FARPs ashore. The distance from the sea base to the objective and the aircraft endurance must be balanced against the required response time. OAS missions may be augmented by joint and coalition aircraft that are both land-based and sea-based on an aircraft carrier. Their inclusion places responsibility on the MAGTF for ensuring good communications and coordination with OAS augmentation forces.

Amphibious Raids

Amphibious raids are conducted as independent operations or in support of other operations, such as another landing, land operations or air or naval operation. Depending on the purpose of the raid, they may be conducted by stealth or appropriately supported so that they resemble the early stages of an amphibious assault. An amphibious raid is planned and executed in the same general manner as an amphibious assault, except a raid always includes provision for withdrawal of the raid force. Surprise is essential for the success of an amphibious raid. Therefore, OAS missions prior to a raid will most likely be either absent or limited to those few that are essential for success. Amphibious raids are well rehearsed, with limited objectives and of short duration. Therefore, fire support planning can be more detailed and of less volume than for that required for an amphibious assault. The need for surprise and the distance to the objective may conspire to make aviation fires the primary fire support for a raid.

Using OMFTS concepts, STOM tactics lend themselves to amphibious raids, especially when employing assault support aircraft from over the horizon. OAS missions in this environment will be most useful when planned to interdict critical targets just prior to the raid, and provide fires on the landing zone/objective for the landing force. OAS missions should be planned to be available for the duration of the raid, including the withdrawal.

Amphibious Demonstrations

The amphibious demonstration is intended to confuse the defender as to time, place or strength of the main operation. An amphibious demonstration normally includes the approach of demonstration forces to the demonstration area, at least a part of the ship-to-shore movement, and employment of supporting fires. A brief but intense preliminary bombardment by naval gunfire will usually be the preferred fire support for a demonstration. Because of the requirement for the demonstration force to execute supporting fires of a nature and scope that ensures credibility, OAS missions may be conducted. However, the danger of losing an aircraft and crew or capture of aircrew supporting an amphibious demonstration may curtail OAS missions in support of those operations.

Amphibious Withdrawals

Amphibious withdrawals are conducted to disengage forces for employment elsewhere. They may be conducted under enemy pressure or voluntarily. Withdrawal begins with establishment of defensive measures in the embarkation area and ends when all elements of the force have been extracted and embarked or re-embarked on designated shipping. With respect to OAS planning, amphibious withdrawals are characterized by having abridged planning processes, curtailed fire support means, and circumstances that

may render it advisable to conduct the operations under adverse weather and limited visibility conditions.

During an amphibious withdrawal, OAS missions will be instrumental in interdicting deep targets, and covering the withdrawal of the heavy elements such as artillery and tanks. The withdrawal of heavy elements usually will take place under cover of darkness. The primary difference for fire support in an amphibious assault versus an amphibious withdrawal is that in the assault, supporting arms and control facilities are progressively built up ashore, whereas, in a withdrawal, supporting arms and control facilities are progressively decreased ashore until all functions are performed afloat. Sea-based OAS assets will be vital in providing cover to the dwindling forces ashore.

SUMMARY

Effective OAS operations begin with accurate and timely intelligence. This information is critical for target development as well as situational updates on threats and the environment. Support requirements can vary from one to any combination of: fighter escort, electronic warfare, SEAD, tankers, reconnaissance, deception, confusion, and operations security.

OAS has the capability to reach targets beyond the range of other supporting arms or when supporting arms are not available. OAS also has its limitations to include number of assets, availability, time on station, and ability to operate in adverse weather conditions.

DAS provides the MAGTF commander the ability to shape the deep battlespace. CAS provides flexible and responsive fire support in coordination with friendly ground units in the close and rear battlespace. Forward basing allows OAS aircraft to reduce their response time and increase their time on station in support of MAGTF objectives.

Since the end of the Gulf War, Marine OAS continues to support joint and multinational operations in MOOTW around the world. The future warfighting concept of expeditionary maneuver warfare (EMW) will take OAS doctrine well into the 21st century in support of the MAGTF.