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ANNEX 3-03 COUNTERLAND

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INTRODUCTION TO COUNTERLAND OPERATIONS

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Military history provides many examples where airpower successfully engaged enemy land forces in modern warfare, from the breakout of Normandy in World War II to the destruction of the Iraqi army in 1991 and 2003 to the overthrow of the Taliban government. Attacking the capabilities of adversary land forces through airpower, counterland operations often provide crucial capabilities on the path to military victory. As a vital element in joint warfare, airpower continues to demonstrate a unique ability to accurately find, fix, track, target, engage and assess (F2T2EA) enemy land forces. With a solid comprehension of counterland operations, airmen increase their ability to properly plan and execute air operations against enemy land forces.

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ROLE OF COUNTERLAND OPERATIONS

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Counterland operations are defined as "airpower operations against enemy land force capabilities to create effects that achieve joint force commander (JFC) objectives." The aim of counterland operations is to dominate the surface environment using airpower. By dominating the surface environment, counterland operations can assist friendly land maneuver while denying the enemy the ability to resist. Although most frequently associated with support to friendly surface forces, counterland operations may also be conducted independent of friendly surface force objectives or in regions where no friendly land forces are present. For example, recent conflicts in the Balkans, Afghanistan, and Iraq illustrate situations where counterland operations have been used absent significant friendly land forces or with small numbers of special operations forces (SOF) providing target cueing. This independent attack of adversary land operations by airpower often provides the key to success when seizing the initiative, especially in the opening phase of an operation.

Counterland operations provide the JFC two distinct types of air operations for engaging enemy land forces with airpower. The first is air interdiction (AI), which is defined as "air operations conducted to divert, disrupt, delay, or destroy the enemy's military surface capabilities before it can be brought to bear effectively against friendly forces, or to otherwise achieve objectives that are conducted at such distances from friendly forces that detailed integration of each air mission with the fire and movement of friendly forces is not required." Airpower indirectly supports land forces and directly supports JFC objectives in the absence of friendly land forces. The second distinct type of air operations is close air support (CAS) which is defined as "air action by fixed- and rotary-wing aircraft against hostile targets that are in close proximity to friendly forces and that require detailed integration of each air mission with the fire and movement of those forces." In contrast to AI, CAS directly supports land maneuver forces. Whether destroying enemy surface forces, interdicting supply routes, or providing CAS to friendly troops, counterland operations are a vital airpower function that applies throughout the range of military operations.

Counterland operations are a form of maneuver warfare that seeks to shatter an enemy's fighting ability through focused attacks against key enemy military targets. Air Force forces, with their inherent speed, range, and precision attack capabilities, are superior theater-wide maneuver forces. Where ground forces must seek out weak points in the enemy line to penetrate and exploit, airpower maneuver allows engagement anywhere, from any direction, at any time, forcing the enemy to be on guard everywhere. The destruction of decisive points, forces, and capabilities by striking enemy military targets such as fielded land forces, command and control (C2) nodes, vital logistics, or supporting infrastructure degrades the enemy system and ultimately renders the enemy incapable of effective resistance. Persistently applied, airpower can disrupt the enemy and crush its ability to fight as a coherent, effective whole, thus wresting initiative and dictating tempo.

Counterland Operations Achieved JFC Objectives

In the first week of November 2001, bombers and fighters supported by SOF destroyed Taliban forces defending the enemy stronghold of Mazar-i-Sharif during Operation ENDURING FREEDOM. These actions facilitated the Northern Alliance's capture of the town on 9 November 2001. Soon, counterland airpower cued by SOF teams routed Taliban forces throughout Afghanistan until Kabul itself fell just days after Mazar-i-Sharif. Within two weeks, Coalition forces took control of Afghanistan by relying on the powerful combination of counterland airpower and distributed ground forces using small-unit tactics.

Counterland operations can support and facilitate maneuver warfare on land. World War I saw the first widespread use of airpower in support of Allied land operations when combat aircraft began cutting supply routes, strafing trenches, and bombing fielded forces. Military leaders soon realized that airpower added a synergistic element to conventional ground forces because of its ability to attack behind enemy

lines and support offensive breakthroughs. Since then, counterland operations have occurred in every major war as well as numerous smaller conflicts characterized by protracted, low-intensity conflict. In each instance, airpower's ability to maneuver in three dimensions has proven invaluable in supporting friendly surface maneuvers by destroying, disrupting, delaying, or diverting an enemy's operational military potential.

Counterland operations can serve as the main attack and be the decisive means for achieving JFC objectives. Although often associated with support to friendly surface forces, counterland operations also include operations that directly support the JFC's theater strategy rather than exclusively supporting a surface component. In some cases, counterland operations can provide the sole US effort against the enemy. This occurred in Libya during Operations ODYSSEY DAWN and UNIFIED PROTECTOR. During these US and NATO led operations, there were no significant numbers of US or NATO ground forces, and air operations were employed to achieve the operational and strategic end states. In concert with strategic attack operations, during OPERATION ALLIED FORCE, the NATO independent counterland battle against Serbian ground forces helped end Slobodan Milosevic's ethnic cleansing campaign.

In other campaigns where a "boots on the ground" presence is required to achieve the desired end state, counterland operations can decisively engage adversary fielded forces prior to occupation by friendly ground forces. During Operation DESERT STORM, counterland operations broke the back of the Iraqi army and achieved JFC objectives aimed at weakening enemy forces prior to the start of ground operations. In the end, the devastating effects of counterland operations paved a path for coalition forces to roll back a demoralized Iraqi army in Kuwait. These historical examples illustrate that directly attacking adversary land forces by airpower forces can quickly gain control over the battlefield during early phases of a conflict.

Counterland operations are not associated with a particular type of aircraft or weapon system. Instead, a variety of airpower assets conduct counterland operations to deliver lethal and nonlethal effects against enemy land forces and infrastructure. Predominant weapons systems used in counterland operations include aircraft equipped with cannons, bombs, standoff missiles, rockets, and electronic warfare systems. Air assets, space platforms, and SOF provide intelligence, surveillance, and reconnaissance (ISR) as well as target cueing, navigation aids, and battle damage assessment (BDA). Each weapon system has unique characteristics that should be considered based on the nature of the threat, targets to be attacked, desired effects, and environmental conditions. Many of the assets used to interdict forces deep in the enemy rear area can also be used to support the close fight. Fighters, bombers, gunships, remotely piloted aircraft/unmanned aircraft,[1] helicopters, cruise missiles, and surface-to-surface missile systems are a few examples of joint assets that commanders can use to execute counterland operations. Also, cyberspace capabilities can be employed to attack enemy C2 and supporting systems.

[1] The USAF refers to some of its larger unmanned aircraft as remotely piloted aircraft (RPA) to differentiate its operators who have been trained to similar standards as manned aircraft pilots.

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COUNTERLAND FUNDAMENTALS

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The commander, Air Force forces (COMAFFOR), executes counterland operations by conducting air interdiction (AI) as the supported or supporting commander or by supporting land forces with close air support (CAS). AI and CAS missions can function under an overall theater posture of offense or defense and are typically coordinated with a ground scheme of maneuver to maximize the effect on the enemy.

COUNTERLAND EFFECTS

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Counterland operations can achieve tactical, operational, or strategic-level effects and can significantly influence the course of a military operation. Counterland effects focus at the tactical and operational levels of war by targeting fielded enemy surface forces and their supporting infrastructure. When planned and executed successfully, counterland operational effects contribute to strategic effects by denying the enemy's ability to execute a coherent ground campaign. In cases where the enemy places strategic value on a specific portion of their ground combat force, counterland operations can produce more immediate effects at the strategic level.

Counterland operations are applicable across the range of military operations. Counterland operations are associated with both major combat operations as well as stability operations characterized by insurgency, guerrilla tactics, and civil strife.[1] Counterland operations against a modern, highly mechanized army differ from operations conducted in an asymmetric environment against irregular forces. Therefore, it is crucial to understand the nature of the conflict to properly apply airpower during counterland operations.[2]

[1] Historical examples include: British air policing in the Middle East during the interwar period, French operations during the battle for Algeria, the US in Vietnam, the insurgent war in El Salvador, and recent US air operations in Iraq and Afghanistan.

[2] For a discussion of counterland applications in a maritime environment see Air Force Doctrine Annex 3-04, *Countersea Operations*

INTERDICTION OPERATIONS

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The purpose of interdiction operations is to divert, disrupt, delay, and destroy, by either lethal or nonlethal means in order to achieve **objectives**. Actions associated with one desired effect may also support the others.[1] **Air interdiction (AI) is defined as "air operations conducted to divert, disrupt, delay, or destroy the enemy's military potential before it can be brought to bear effectively against friendly forces, or to otherwise achieve objectives that are conducted at such distance from friendly forces that detailed integration of each air mission with the fire and movement of friendly forces is not required."**[2] AI targets may include fielded enemy forces or supporting components such as operational command and control (C2) nodes, communications networks, transportation systems, supply depots, military resources, and other vital infrastructure. When conducted as part of a joint campaign, AI needs the direction of a single commander who can exploit and coordinate all the forces involved.

The commander, Air Force forces (COMAFFOR) is normally the supported commander for the joint force commander's (JFC's) overall AI effort. When designated as the supported commander, the COMAFFOR will conduct theater-wide or joint operations area- (JOA-) wide AI to support the JFC's overall theater objectives. With the preponderance of AI assets and the ability to plan, task, and control joint air operations, the COMAFFOR can best plan and execute AI. The COMAFFOR recommends theater and/or JOA-wide targeting priorities and, in coordination with other component commanders, forwards the air apportionment recommendation to the JFC. The COMAFFOR plans and executes the interdiction effort in accordance with the JFC's guidance.

[1] Joint Publication 3-03, *Joint Doctrine for Joint Interdiction*

[2] Not all air interdiction falls under the category of counterland. History has many examples of airpower interdicting the enemy's air or sea lines of communication; these are actually counterair or countersea missions even though they may have an interdiction effect at the operational level. Additionally, some interdiction missions may be considered a subset of strategic attack.

CLOSE AIR SUPPORT FUNDAMENTALS

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Close air support (CAS) is defined as "air action by fixed- and rotary-winged aircraft against hostile targets that are in close proximity to friendly forces and that require detailed integration of each air mission with the fire and movement of those forces." CAS provides supporting firepower in offensive and defensive operations to destroy, disrupt, suppress, fix, harass, neutralize, or delay enemy targets as an element of joint fire support. The speed, range, and maneuverability of airpower allows CAS assets to attack targets that other supporting arms may not be able to engage effectively. When conditions for air operations are permissive, CAS can be conducted at any place and time friendly forces are in close proximity to enemy forces and, at times, may be the best means to exploit tactical opportunities.

Although in isolation CAS rarely achieves campaign-level objectives, at times it may be the more critical mission due to its contribution to a specific operation or battle. CAS should be planned to prepare the conditions for success or reinforce successful attacks of surface forces. CAS can halt enemy attacks, help create breakthroughs, destroy targets of opportunity, cover retreats, and guard flanks. To be most effective, CAS should be used at decisive points in a battle and should normally be massed to apply concentrated combat power and saturate defenses. Elements of the theater air control system (TACS) must be in place to enable command and control and clearance to attack in response to rapidly changing tactical circumstances. In fluid, high-intensity warfare, the need for terminal attack control, the unpredictability of the tactical situation, the risk of fratricide, and the proliferation of lethal ground-based air defenses make CAS especially challenging.

CAS requires a significant level of coordination between air and surface forces to produce desired effects and prevent fratricide. CAS employment should create effects that support the ground scheme of maneuver. The fluidity of the ground situation that exists within close proximity usually requires real-time direction from a joint terminal attack controller (JTAC) to ensure that targets of highest priority to the ground commander are struck. Additionally, when friendly forces are within close proximity, more restrictive control measures may be required to integrate CAS with surface maneuver and joint fires. The integration of airpower and surface maneuver is an important factor for mitigating fratricide from both air-delivered weapons and surface fires. Thus, Airmen should consider two key factors when employing CAS: the need for

flexible, real-time targeting guidance and the avoidance of hitting friendly ground forces in close proximity to the target.

Detailed Integration and Release Authority

In the definitions of air interdiction (AI) and CAS, the requirement for detailed integration is a key difference between the two mission areas. When there are no friendly forces in close proximity to the engagement, detailed integration may not be required because the possibility of fratricide is lower. Since AI should not require detailed integration, aircrew employ munitions based on the rules of engagement (ROE) and target identification standards set forth in theater guidance, without the need for additional clearance. AI release authority may be delegated to the aircrew conducting the mission. Beyond the fire support coordination line (FSCL) this delegation would come from the commander, Air Force forces or an authorized element of the theater TACS. For AI release authority short of the FSCL (i.e. within fire support coordination measures such as a kill box), the air support operations center (ASOC) will normally coordinate with the air operations center (AOC) and act as the Air Force command and control element. Although AI release authority is delegated to the aircrew, this does not preclude off-board target cueing and/or terminal guidance operations from special operations forces (SOF), Joint Surveillance Target Attack Radar System (JSTARS), strike coordination and reconnaissance (SCAR), ASOC, or intelligence, surveillance, and reconnaissance ISR platforms.

Conversely, CAS requires detailed integration because friendly forces are in close proximity to the engagement. The ground commander is the release authority within the area of operations (AO) and in most cases does not delegate it to the aircrew with the possible exception of a forward air controller–airborne [FAC(A)]. The ground commander delegates this release authority to personnel trained as JTACs in direct support of his/her element, who in turn provide clearance to CAS aircraft.

TYPES OF AI AND CAS

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Counterland missions are either scheduled or on-call. Scheduled missions result from preplanned requests during the normal air tasking order (ATO) cycle and allow for detailed coordination between the tactical air and ground units involved. Additionally, preplanned requests may result in counterland sorties in an on-call status (either airborne or ground alert) to cover periods of expected enemy action, respond to immediate requests, or attack dynamic targets. Scheduled air interdiction (AI) missions use detailed intelligence to attack known or anticipated targets in an operational area to generate effects that achieve joint force commander (JFC) objectives. Scheduled close air support (CAS) missions are normally allocated to a specific ground unit or operation. Air planners attach a “G” or “X” prefix to the ATO mission identifier to designate either ground or airborne alert, respectively.

With the appropriate commander’s approval, any scheduled counterland mission (AI or CAS) can be dynamically re-tasked to provide CAS or attack time-sensitive targets (TSTs) if requisites such as aircrew qualifications, weapons load, and weapons fusing are compatible. Commanders and planners should carefully consider the resultant balance between effectiveness and efficiency caused by keeping a portion of air assets in reserve when apportioning ground-based and air alert missions. Immediate requests may result from situations that develop after the suspense for preplanned requests in a particular ATO cycle. Dynamic targeting provides a responsive use of on-call or dynamically re-tasked counterland missions to exploit enemy vulnerability that may be of limited duration. However, dynamic targeting may lead to an overall reduction in the probability of success because of reduced time for mission preparation and target study.

The following are counterland missions found in the ATO:

- **AI** is a mission scheduled to strike particular targets in response to JFC or component target nominations
- **GAI** is the AI term used to identify an on-call mission placed on ground alert to provide responsive AI throughout the theater in response to emerging targets
- **XAI** is the AI term used to identify a scheduled mission that provides airpower to a designated area versus a preplanned target and is flown when targets are not known or briefed in advance (also referred to as armed reconnaissance). During these

missions the aircrew finds and attacks targets of opportunity (i.e., enemy materiel, personnel, and facilities) in assigned areas

- **SCAR (**Strike Coordination and Reconnaissance**)** missions use aircraft to detect targets for dedicated AI missions in a specified geographic zone. The area may be defined by a box or grid where worthwhile potential targets are known or suspected to exist, or where mobile enemy surface units have relocated because of ground fighting.
- **CAS** is a mission scheduled to provide air support in response to preplanned CAS requests
- **GCAS** is the CAS term used to identify an on-call mission placed on ground alert status to provide responsive air support to ground forces that encounter substantial enemy resistance. CAS assets located close to the supported ground forces normally provide faster response times. GCAS missions may be changed to XCAS as the situation dictates. *See 'Pull CAS' discussion, under TYPES of CAS MISSIONS paragraph*
- **XCAS** is the CAS term used to identify an on-call mission on airborne alert status in the vicinity of ground forces that expect to encounter enemy resistance. XCAS sorties typically remain in established holding patterns to provide responsive air support while waiting on a tasking from any ground unit that needs CAS. If no tasking evolves during the vulnerability period, XCAS missions may swing to an AI role if other appropriate targets exist. *See 'Push CAS' discussion, under TYPES of CAS MISSIONS paragraph*

Some theaters of operation may use non-doctrinal mission taskings such as "armed overwatch." These are specific applications of either CAS or AI and should not be confused as a new counterland mission category. During counterinsurgency (COIN) operations in Iraq and Afghanistan, ground commanders relied heavily on aircraft

Command Relationships and Mission Types

The Theater Battle Management Core Systems (TBMCS) has a myriad of "mission type" descriptors for missions ranging from direct support of surface forces, to the independent application of airpower supporting JFC objectives in the absence of surface forces. Mission type descriptors and their prefixes should not be confused with or tied to supported/supporting relationships. For example, an XINT mission using SOF as a sensor could quickly devolve to a CAS mission if the SOF unit were compromised. In this case, airpower supported by SOF becomes SOF supported by airpower very quickly, and the TBMCS mission type planned is irrelevant.

conducting "armed overwatch" missions to provide full motion video in support of the ground commander's scheme of maneuver. Armed overwatch provided critical situational awareness and when necessary, immediate CAS in the dynamic COIN environment. If the situation requires the "armed" portion of the mission, including

shows of force, it should be considered CAS in support of the affected ground force and use CAS procedures as outlined in JP 3-09.3, *Close Air Support*. Armed overwatch should not be considered a new or independent counterland mission area distinct from CAS; however, commanders may develop specific procedures in addition to CAS procedures if required for the "overwatch" portion of mission.

Other examples of unique counterland missions include the generic term "attack" for missions that do not clearly meet AI definitions, and strategic attack (SA) for air-to-ground missions that fall under a different operational function than counterland.

DERIVATIVE MISSIONS ASSOCIATED WITH COUNTERLAND

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Derivative mission-types are frequently tasked to complement and support counterland operations. The following discussion briefly describes common missions associated with the effective accomplishment of, close air support (CAS) and air interdiction (AI).

Forward Air Controller (Airborne) (FAC[A]). FAC(A) missions provide terminal attack control (TAC) for CAS aircraft operating in close proximity to friendly ground forces. Because of the risk of fratricide, FAC(A)s are specially trained aviation officers qualified to provide delivery clearance to CAS aircraft. The FAC(A) is the only person cleared to perform such control from the air, and can be especially useful in controlling CAS against targets that are beyond the visual range of friendly ground forces.

Tactical Air Coordinator (Airborne) (TAC[A]). TAC(A) missions provide communications relay between the tactical air control party (TACP) and attack aircraft, as well as other agencies of the TACS, in the absence of Joint Surveillance Target Attack Radar System (JSTARS), Airborne Warning and Control System (AWACS), control and reporting center (CRC) or a FAC(A). The TAC(A) also expedites CAS aircraft-to-JTAC handoff during “heavy traffic” CAS operations.

Strike Coordination and Reconnaissance (SCAR). SCAR missions use aircraft to detect targets for dedicated AI missions in a specified geographic zone. The area may be defined by a box or grid where worthwhile potential targets are known or suspected to exist, or where mobile enemy surface units have relocated because of ground fighting.

SCAR missions are normally part of the command and control (C2) interface to coordinate multiple flights, detect targets, kill targets, neutralize enemy air defenses, and provide battle damage assessment (BDA). SCAR aircrew perform a similar function for AI missions that FAC(A) provide for CAS missions. Typical tasks include cycling multiple attacking flights through the target area and providing prioritized targeting guidance to maximize the effect of each sortie. Aircrew on most fighters and some C2 platforms, such as the JSTARS, are trained to coordinate SCAR missions. Platforms like MQ-1/9 remotely-piloted aircraft can perform specific SCAR tasks such as locating, verifying, and cross-cueing other assets to positively identify targets and pass target updates. These platforms may also be able to engage targets on their own,

buddy lase for manned aircraft, and provide BDA for the same mission. Optimally, the control and sequencing of aircraft is best performed by an AWACS or a CRC.

Even though some SCAR responsibilities are similar to that of a FAC(A), *SCAR aircrew do not have the authority to conduct terminal control of CAS.* FAC(A)s undergo specialized training to effectively coordinate and integrate air-ground forces to conduct TAC safely during CAS—a SCAR aircrew does not have release authority, nor do they clear other aircraft for employment of munitions. The bottom line: a FAC(A)-qualified pilot can conduct SCAR but a SCAR pilot without FAC(A) qualification cannot conduct FAC(A) duties. Planners and commanders need to understand this important nuance when tasking XAI/armed reconnaissance missions or diverting airborne aircraft to an immediate CAS request since the AI aircrew may not be CAS qualified.

Air superiority. Counterland operations require freedom to act to be successful. Counterair provides the air superiority needed to conduct operations at a given time and place without *prohibitive* interference by an opposing force. By doing so, the aircrew can focus on target acquisition and weapons delivery parameters to achieve the desired effects. Operations prior to achieving the needed level of air superiority should be reserved for targets presenting an imminent danger.

ANNEX 3-03 COUNTERLAND OPERATIONS

COUNTERLAND AND UNITY OF EFFORT

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Counterland operations are most effective when planned and conducted in a unified effort with other air, land, sea, space, and special operations forces (SOF). Counterland levies requirements on airpower planners to plan, execute, and assess in coordination with surface components. Air and surface commanders should work together to identify crucial targets; decide when, where, and how to attack them; and determine how surface operations and counterland can best complement each other to achieve joint force commander (JFC) objectives and to create opportunities for other maneuver elements to exploit.

When discussing airpower in counterland operations, it is necessary to recognize the contribution of other components' aviation arms to a unified effort. Navy, Marine Corps, Army, and SOF aviation assets can be used for both air interdiction (AI) and close air support (CAS). While the primary task for Marine aviation is support to their own ground forces, excess Marine sorties may execute other elements of the JFC's plan. Scout and attack helicopters may also prove valuable platforms for counterland missions even though they lack the speed, range, and survivability of fixed-wing assets. Although the Army does not consider their helicopters CAS platforms, they can nevertheless employ CAS tactics, techniques, and procedures (TTP) when operating in support of land forces. Depending on circumstances and threat, SOF manned and unmanned aircraft, as well as special tactics teams may be available to support certain counterland operations. Air and surface-launched cruise missiles can also be employed for interdiction. In multinational coalitions, air forces from allied nations may be available for counterland employment.

Regardless of which component the assets come from, the counterland effort is guided by a single air component commander and directly supports the overall joint operation or campaign. Centralized control is a fundamental airpower tenet that commanders must exercise to guarantee the optimum concentration of airpower where it is most needed. The commander, Air Force forces (COMAFFOR) is normally the supported commander for the JFC's overall AI effort. When designated as the supported commander, the COMAFFOR conducts theater-wide or joint operations area- (JOA-) wide AI in direct support of the JFC's overall theater objectives. This functional responsibility is executed by engaging the enemy across the operational area wherever

valuable AI targets are found, to include those found inside a surface area of operations (AO). AI used in this manner tends to have the greatest overall effect on the enemy, but the results may be delayed in comparison with AI employed closer to the ground battle. If theater objectives dictate, AI may operate in support of a particular portion of the theater where it is more closely integrated with the ground battle. This form of AI may strike targets nominated through the joint targeting process by either the air or surface component and often produces results visible to the surface commander more quickly than a theater-wide AI effort. These results also tend to be smaller in scope and shorter in duration.

The most detailed integration of air and surface components is found in CAS where the air attack and ground battle are a single cohesive effort. Proper integration of counterland and surface operations is vital to the success of both, and the synergistic effect of integrated operations is often much greater than the sum of individual air and surface operations. This is especially true if a single, integrated joint operations plan is employed instead of attempting to synchronize individual plans developed by the various components.

The Airman's perception of depth differs from that of the Soldier in that airpower can reach to any depth of the operational area—from the close battle area back to and beyond the enemy's heartland. As an aerial maneuver force, counterland operations should not be considered as "flying artillery." Counterland assets have much greater range and targeting options; can adapt to changing situations while en route to the target area; can retarget based on onboard or off-board information updates; can fight their way through enemy defenses; and can orbit over a given area while reconnoitering for targets of opportunity. Depending on the designated strategy, airpower's reach enables a commander to focus counterland effects in a small area or disperse them uniformly across the theater at whatever depth is required. Normally the air component operates across the joint operations area. Airpower should not be limited to a single or even multiple independent area of operations.

Air and surface maneuver forces share supporting roles during counterland operations. CAS represents aerial maneuver in direct support of surface maneuver. Air attack of ground-nominated AI targets is aerial maneuver indirectly supporting ground maneuver. Air attack against theater-wide AI targets is aerial maneuver that either provides general support to the ground force or directly achieves JFC objectives. In some circumstances ground maneuver may support aerial maneuver by forcing the enemy into a position that is more vulnerable to air attack, enabling airpower to deliver a decisive blow. Moreover, SOF have proven extremely effective for target identification and cueing, as was the case during Operations ENDURING FREEDOM and IRAQI FREEDOM. In those circumstances in which air forces conduct AI in the absence of friendly surface forces, enemy forces are able to disperse and seek cover in a way that complicates the problem for Airmen. However, as was shown in Operation ALLIED FORCE, airpower can still create decisive effects and lead to success for the joint force. Whether air or surface forces are the decisive element is not what matters. Instead, the proper integration of air, space, and surface forces is required for successful joint operations.

Fires are defined as “the use of weapon systems to create specific lethal or nonlethal effects.” Joint fires are defined as “fires delivered during the employment of forces from two or more components in coordinated action toward a common objective.” Counterland itself is not joint fires; rather, it represents a form of aerial maneuver, which delivers fires on various targets as required. Those counterland missions that are apportioned to support another component, such as CAS and some AI, can be defined as meeting the description of “two or more components in coordinated action.” Therefore, the application of these missions can be called joint fires. Those missions that operate in direct support of theater strategy, such as theater-wide AI are not operating in “coordinated action” with another component; rather those missions are conducted with assigned forces in support of a scheme of maneuver. Therefore, the fires produced by these missions are not considered joint fires.

AIR INTERDICTION

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Air interdiction (AI) represents a flexible and lethal form of airpower that can be used in various ways to prosecute the joint operation. However employed, certain principles such as centralized control/decentralized execution should be followed to achieve maximum effectiveness with minimum losses. AI can channel enemy movement, constrain logistics, disrupt communications, or force urgent movement to put the enemy in a favorable position for friendly forces to exploit. To be most effective, AI requires persistence, concentration, joint integration, and intelligence that is both timely and accurate. Whether supporting the ground offensive by attacking ground-nominated targets or decisively halting an enemy advance with theater-wide interdiction, AI provides a powerful tool for defeating the enemy ground force.

AI increases airpower's efficiency because it does not require detailed integration with friendly forces. Detailed integration requires extensive communications, comprehensive deconfliction procedures, and meticulous planning. AI is inherently simpler to execute in this regard. Therefore, if the enemy surface force presents a lucrative target, AI conducted before friendly land forces make contact can significantly degrade the enemy's fighting ability and limit the need for close air support (CAS) when the two forces meet in close combat.

Air Interdiction and Shaping Operations

From a soldier's perspective, *shaping operations create or preserve conditions for the success of decisive operation.* (Army Doctrine Publication 3-0, *Unified Land Operations*). Therefore, soldiers may consider AI as shaping which solely supports their maneuver elements. From an Airman's perspective, AI may be conducted either in support of surface force objectives or in direct support of JFC objectives; in the latter case, the air component commander might be the supported commander. Because of these slightly differing views, there is a potential for friction between the air and land components regarding supporting/supported roles and responsibility for planning. These situations require careful and continuing dialogue between the senior commanders and their common superior commander.

The air component often conducts theater-wide air attacks against enemy land forces and their resources to achieve joint force commander (JFC) objectives. This autonomous use of AI usually occurs outside of a surface component's area of operations (AO). Special operations forces (SOF) air and ground assets may play a significant supporting role during AI with their ability to seamlessly integrate into the find, fix, track, target, engage and assess (F2T2EA) process.

Using JFC priorities and understanding the surface component's scheme of maneuver, the commander, Air Force forces **(**COMAFFOR) can employ AI to provide effects that facilitate and support the maneuver. The COMAFFOR may support a land scheme of maneuver by conducting AI within a surface commander's AO. After coordinating priorities, effects, timing, and targets with surface components, the COMAFFOR directs responsive AI across the joint operations area (JOA) against enemy military capabilities that contribute directly to, or are maneuvering to reinforce, the conflict. US ground commanders often consider AI synonymous with what they express as "shaping" operations. From an Airman's perspective, shaping may be regarded as preparing the operational environment with AI to assist the surface component's scheme of maneuver.

INTERDICTION OBJECTIVES

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It is not necessary for an air interdiction (AI) operation to focus solely on a single objective; in fact, AI typically inflicts multiple effects on the enemy. The enemy army traveling to the front while under air attack will suffer some level of destruction. The remaining force will likely be delayed in getting to its destination and will suffer some level of physical and psychological disruption. The following describes the objectives for interdiction.

Divert. AI diverts enemy fielded forces from areas where critically needed, to a location more favorable to the joint force commander (JFC), or around established lines of communications (LOCs). It may divert resources en route to repair and recover damaged equipment and facilities as well as forces tasked to keep existing LOCs open.

Disrupt. AI planners should focus on the enemy critical vulnerabilities that result in disruptive effects on command and control (C2), intelligence collection, and transportation and supply lines (e.g. ammunition or petroleum, oil, and lubricants [POL]). Planners should consider the psychological effect on the enemy's moral and will, historically an airpower strongpoint. When analyzing the enemy considerations include the enemy's strategy, current operational situation, what reserves or workarounds are available to the enemy, and time before the enemy is affected by friendly actions.

Delay. Delaying the enemy allows friendly forces to gain time and momentum. While its purpose is to improve the JFC's operational environment, for delay to have a major impact on combat operations, the enemy must face urgent movement requirements in support of its own operations or in countering friendly maneuver, or enhance the effect of a planned friendly maneuver. Ideally, by the air component maintaining the initiative, the opponent is forced to make unplanned urgent movements at times and places that maximize their exposure to additional friendly targeting. Delay payoffs include prolonging the time of risk to attack to land or naval forces, vehicles amassed behind a damaged route segment, or ships trapped in harbor due to mines rendering them ineffective and placing them at risk to lethal action.

Destroy. Destruction of the enemy surface force, supporting elements, and supplies is the most direct of the four objectives of AI but the act (actual or perceived) may also provide synergy among the four. The enemy's perception of its imminent destruction

can achieve substantial delay and diversion of enemy resources being as effective as physically destroying target systems, if it causes the enemy to react in a way upon which friendly forces can capitalize. Destroying transportation systems may cause the enemy to move only at night or to mass air defense assets (which may be useful elsewhere) around critical transportation nodes. The actual or perceived destruction of LOCs may divert engineering resources from other tasks to prepare alternate routes in anticipation of possible attacks. This may be true when transportation systems remain largely undamaged. Planners should be cognizant that destruction may also inhibit friendly freedom of action. For example, destruction of key transportation targets could hinder future surface operations that intend to use the same infrastructure. Appropriate coordination of AI with other joint force components helps preserve friendly freedom of action.

AIR INTERDICTION EFFECTS

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Air interdiction (AI) effects differ with every situation and can significantly affect the course of an operation. AI against an enemy with minimal logistics requirements, a simple force structure, and primitive logistics systems differs from AI conducted against a highly mechanized, modern force possessing intensive logistics requirements. Interdiction conducted against enemy forces and logistics, without regard to the overall theater situation, may be largely ineffective; therefore planning for interdiction should be closely integrated in the joint force commander's (JFC's) overall planning process.

The effectiveness of AI is dependent on a number of variables. The time required for AI to affect the enemy, and the duration and depth of those effects, depends on several factors. These factors include, but are not limited to, the distance between interdiction operations and the location of intended effects; the means and rate of enemy movement (ships, trains, aircraft, trucks), the physical target (forces, supplies, fuel, munitions, infrastructure), the level of enemy activity, enemy tactics, and the resilience of the targeted force or system AI will have a more robust effect in linear combat against a modern, mobile, conventional force utilizing significant resources. The timing and magnitude of effects will vary depending upon where AI is conducted and the nature of the enemy. AI deep in the operational area will usually produce extensive, protracted effects that take longer to occur while AI conducted near the front lines typically produces immediate, but geographically limited, effects. During major operations and campaigns the effects of AI are typically more apparent by influencing an enemy's ability to command, mass, maneuver, supply, and reinforce available conventional combat forces. AI may have negligible effects against an insurrection during stability operations where the enemy employs a shadowy force structure, a simple logistics net and unconventional tactics. Timely, accurate intelligence and persistent operations, allows AI to disrupt enemy supply operations, destroy weapons caches, or deny sanctuary to insurgents. To maximize the influence AI has on an enemy, commanders need to understand how its effects will differ depending on the nature of the conflict being fought.

Whether the Air Force is involved in major operations and campaigns or smaller scale contingencies, **AI can channel movements, constrict logistics systems, disrupt communications, force urgent movement, and attrit enemy fielded forces.**

CHANNELING ENEMY MOVEMENTS

AI channels the movement of ground forces when conditions force the enemy to maneuver through or along predictable avenues. This generally results from the lack of transportation routes, manmade and natural obstacles, and other geographic

Counterland Operations During Operation Iraqi Freedom

Counterland Operations had a devastating effect on the Iraqi armed forces during OIF. The Commander of the Al-Nida Republican Guards Division, whose division dissolved from the psychological impact of the air attacks, commented to interviewers after the war:

In the 42nd Brigade sector, the troops were in their prepared positions and were hit very effectively for five days. The continuous nature of the attacks did not allow us to track the number of losses. After the attacks many of the soldiers "escaped" [a euphemism for deserted]. By the end of the war more than 70 percent of the Al-Nida Republican Guard Division "escaped," [while at the conclusion of hostilities] between the air strikes and desertions only 1000-1500 soldiers remained out of more than 13,000.

Iraqi Perspectives Project, A View of Operation Iraqi Freedom from Saddam's Senior Leadership, Kevin M. Woods, with Michael R. Pease, Mark E. Stout, Williamson Murray, and James G. Lacey.

constraints. With fewer routes available to transport enemy supplies and reinforcements, the greater the loss or delay caused by severing those routes. Attacks on enemy lateral lines of communications (LOCs) can channel movement, impair reinforcement, reduce operational cohesion, and create conditions for defeating the enemy in detail. Geography influences the rate of enemy movement, the size of the force to be moved, where it can move, and the means required to move the force.

Geography may also restrict or channel ground movement, creating chokepoints and concentrated targets. In cases where geography favors rapid movement of enemy forces, AI assets can create artificial or temporary chokepoints by laying large numbers of scatterable mines, dropping bridges, or collapsing tunnels.

Air component planners should coordinate the AI effort with the surface component planners when they are establishing their overall scheme of maneuver. LOCs used by the enemy may also facilitate rapid advance of our own ground forces, requiring properly coordinated trade-offs between interdicting the enemy and preserving key routes for advancing friendly ground units.

Constricting the Enemy's Logistics System

Heavy ground combat creates demands on enemy fielded forces and speeds consumption of vital war materiel. This in turn increases the effects of AI operations by straining the enemy support system and reducing stockpiles. When the enemy consumes large quantities of supplies because of heavy combat or extensive movement, interdiction operations have an accelerated impact for two reasons. First, when opponents are under heavy pressure, they may be forced to use up stockpiles reserved for ongoing or future operations. Inability to stockpile supplies makes it more difficult for the enemy to initiate large-scale offensive operations. Second, high consumption drives an enemy to use more direct routes, making them more vulnerable to interdiction attacks. The nature of ground combat also determines which supporting elements are most critical at any given time, as which items of supply and infrastructure are critical can vary greatly with the situation. Historically, an enemy force fighting under static conditions is more affected by the destruction of munitions, while a highly mobile enemy is more disrupted by the loss of fuel and transportation.

The less surplus capacity the enemy's logistics system has, the less it can compensate for damage. Degrading the mobility of the enemy's distribution system hinders its ability to redistribute assets to effectively counter friendly operations. When attacking the enemy's logistic systems, it is normally prudent to concentrate efforts on a small number of limiting factors such as concentrations of supplies; petroleum, oils, and lubricants (POL); storage and resupply systems; or soft vehicles. There may not be enough interdiction assets to attack all of an enemy's logistic systems, even sequentially over time.

The enemy transportation system itself should also be broken down into components when analyzing for weaknesses to attack. Most transportation systems consist of the actual conduit for travel (roads, rail, etc.), vehicles used to transport troops or supplies along the conduit, energy required for those vehicles to operate (typically POL or electricity), command and control (C2) to run the transportation system, and repair facilities to keep the system operating. The loading and unloading points in the transportation system may prove especially lucrative, as large concentrations of enemy forces or supplies are often found there. Examples include rail yards, harbors, and airfields. If forces or supplies are critically needed at the front, the enemy may not have

the luxury of dispersing them during loading or unloading, which increases vulnerability to attack. Moreover, environmental impacts on the transportation system can create additional chokepoints worth exploiting. In many cases, the enemy will use the same transportation system for both forces and supplies. Under such circumstances, destroying or degrading the enemy's LOCs will affect both their force mobility and resupply capability. When analyzing an enemy transportation network for importance to their overall strategy, all possible uses for such a system should be considered. Before making the decision to interdict the enemy's transportation network, it should be analyzed for surplus capacity and reconstitution capability. Failure to do this has sometimes led to large-scale AI efforts that had little chance of success (e.g., the limited effectiveness in halting activity on the Ho Chi Minh Trail during the Vietnam War).

Disrupting Enemy Communications

The enemy's combat operations may be disrupted with attacks on their C2 nodes; the level of communications disruption should be commensurate with overall objectives. C2 attacks may seek complete isolation of enemy combat forces from higher headquarters, or such attacks may force the enemy to use less capable, less secure backup communication systems that can be more easily exploited by friendly forces. When the enemy employs a rigid, top-down C2 doctrine, they can be particularly vulnerable to the disruptive effects of C2 interdiction. This is especially true when the enemy has not had a long preparation period to exercise their plan, or when the conflict has moved beyond the initial stages. Conversely, an enemy that practices a high degree of C2 autonomy will likely be less affected by attacks on their C2 network. When the ground situation has been static for long periods before the campaign, chances are greater that the enemy has planned and trained for either offensive or defensive operations. Under such circumstances, attacks on enemy C2 are less likely to have significant effects, as the enemy is still able to react in a scripted manner. Once enough time has elapsed for events to overcome a preplanned enemy response, attacks on C2 will impair their ability to respond and pay larger dividends on the battlefield. In some circumstances, such as when the operations plan includes forcing the enemy to react to friendly maneuver, complete destruction of their C2 architecture would be counterproductive. The capability to affect the enemy through nonlethal information operations should also be considered, as this approach may lead to better overall results while freeing up conventional attack assets for other forms of AI.

Forcing Urgent Movement Upon the Enemy

The enemy may execute urgent movement for several reasons: an attempt to achieve surprise, the need to attack before reinforcements or supplies arrive, the requirement for rapid reinforcement of threatened defensive positions, the attempt to exploit offensive operations, or when driven to urgent movement by interdiction effects. Under these conditions, the enemy has a strong incentive to attain specific objectives within time constraints. Rapid movement of enemy forces and supplies may make them more vulnerable to AI. They generally become more concentrated while traversing more exposed and predictable avenues, foregoing time-consuming camouflage and

concealment efforts. However, urgent movements are temporary due to a desire to limit exposure. For friendly forces to capitalize on such opportunities, they should deny the enemy mobility when needed most. Close coordination is required among all forces to take full advantage of the situation. Additionally, commanders should have access to information systems able to process real-time and near real-time intelligence in order to exploit the capabilities of interdiction and opportunities that AI operations create. Friendly forces should take full advantage of all intelligence, surveillance, and reconnaissance assets, from air- and space-borne sensors to SOF air and surface elements, to detect when these movements occur. Coordination should occur among all forces to take full advantage of the situation in the time provided; otherwise, the enemy may escape the desired effects of AI.

Attrition of the Enemy

AI can attrit enemy forces and materiel, tipping the balance of forces in favor of friendly units. AI against enemy fielded forces has traditionally been more limited than the other effects, mainly due to the difficulty of finding and targeting individual guns or vehicles. Although modern sensor and weapons technology enables more accurate engagement of enemy targets, commanders should not be lulled into the belief that this will assure the direct destruction of enemy forces. Resources, terrain, weather, enemy actions, and enemy characteristics are just a few variables to consider when developing an AI strategy.

The fact that directly attacking individual enemy forces is possible does not mean it is always the most efficient approach in terms of munitions and sorties available. Although the direct destruction of individual enemy forces has an immediate impact on enemy combat power, it usually requires more assets due to the larger number of individual targets—especially if they are dispersed or dug in. Often, the isolation of large enemy formations by destroying enemy logistics nets, sustaining resources, and supporting infrastructure can achieve more widespread results than attacking individual tanks or artillery pieces.

Terrain and weather affect the ability to attrit enemy forces. Attacking an enemy in open terrain in good weather significantly differs from striking an enemy in rough wooded terrain under a layer of adverse weather. As an example, exposed Iraqi forces were much easier AI targets for coalition airpower during Operation DESERT STORM than dispersed Serbian forces that took cover using trees, valleys, and adverse weather conditions during Operation ALLIED FORCE.

Enemy characteristics influence an attrition-based strategy. The number and vulnerability of enemy fielded force components, along with the enemy's ability to replace its losses, should be weighed against the expected results of targeting the supporting infrastructure. An attrition-based strategy against enemy fielded forces tends to produce intense localized results with fewer disruptive effects across the entire enemy system. Psychologically disruptive effects, however, may prove to be an added benefit. Enemy movement also influences the ability to destroy enemy fielded forces.

During Operations DESERT STORM and IRAQI FREEDOM, the presence of coalition land forces forced the enemy to react *en masse,* leaving them detectable and exposed to air attack. However, because Operation ALLIED FORCE saw no use of significant coalition land forces, the Serbs were able to use dispersion, deception, and concealment tactics. Thus, friendly ground maneuver that forces an enemy to react and become predictable can make an attrition strategy viable and more effective. Retreating enemy forces remain a legitimate target in AI operations as such forces may be available for continual use by the opposing commander. However, surrendering (or surrendered) forces are not legitimate targets, if it has been established that such forces are surrendering, and the attacking force is in a position to know of the surrender.

TYPES OF AIR INTERDICTION REQUESTS

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Air interdiction (AI) requests fall into two categories: preplanned and immediate. Each type of request is influenced by a variety of factors. Unless time constraints dictate otherwise, preplanned requests should always be accomplished to allow for proper weapon-target combination, target area tactics planning, threat avoidance, weather study, and other variables, to maximize the probability of target destruction with minimum losses. Attacking mobile or short-notice targets provides a more flexible response that can capitalize on opportunities, but lack of mission planning can reduce effectiveness and higher friendly losses may be expected. Real-time information technology and digital cockpit imagery reduce, but do not eliminate, this factor. Kill box operations can also add a flexible response option, enabling timely and effective coordination and control as well as facilitating rapid attacks. Combining the traditional aspects of both an airspace coordinating measure (ACM) and fire support coordination line (FSCM) enables expeditious air-to-surface attack of targets that can also be augmented by or integrated with surface-to-surface indirect fires.

Preplanned Requests

Preplanned AI is the normal method of operation in which aircraft attack prearranged or planned targets. This mode is used to hit specific targets that are known in advance, and detailed intelligence information is available to support strike planning. Preplanned attacks are normally flown against fixed targets or against mobile targets that are not expected to move in the interval between planning and execution (e.g., revetted tanks). Target information for scheduled AI can come from sources that vary from overhead reconnaissance to ground-based special operations forces (SOF). Preplanned AI is conducted within the normal air tasking cycle and provides enough time for close coordination with other joint force components. It is crucial for component liaisons to communicate and work together to facilitate centralized planning and effective integration, and avoid duplicating effort. Preplanned AI requests evolve into scheduled and on-call missions.

- **Scheduled missions** are planned against targets on which air attacks are delivered at a specific time

- **On-call missions** are planned against targets other than scheduled missions for which a need can be anticipated but which will be delivered upon request rather than a specific time. On-call AI missions can produce responsive, flexible effects. In cases where a specific area to search for enemy AI targets cannot be predetermined, these missions are designated as airborne air interdiction (XAI) or ground-based alert air interdiction (GAI) on the air tasking order (ATO) and may be put on an airborne alert status. The appropriate command and control (C2) agency provides guidance to a specific target, kill box, or target area. XAI missions will normally be given a target priority list or other guidance defining which targets to attack for greatest disruption of the enemy. This set of target priorities may be available prior to takeoff, or may be passed in flight by an appropriate C2 agency such as a forward air controller–airborne (FAC), an air support operations center (ASOC), AWACS, or a JSTARS. If no targets are discovered in the designated area, XAI missions should be prepared to proceed to a backup target if available or requested by the designated controlling agency. Planners should attempt to match proper weapons load-out with expected target types to maximize XAI effects. When flexible AI is flown in direct support of the surface component, the target priorities should reflect those established by the surface component and communicated via the appropriate component liaison officer (LNO) within the theater air-ground system (TAGS). The air support operations center (ASOC) normally coordinates and directs preplanned AI requests flown short of the fire support coordination line (FSCL).

Immediate Requests

Immediate AI meets specific requests which arise during the course of a battle and which by their sudden nature are not planned in accordance with the normal ATO process. Immediate AI requests can respond to unplanned or unanticipated targets that require urgent, time-sensitive attention. It should be noted that many immediate requests for AI allow sufficient time for in-depth planning prior to execution even if those requests fall inside of the normal 72-hour air tasking cycle that defines “immediate.” Immediate AI often responds to attack requests against dynamic and time-sensitive targets (TSTs).

Dynamic targeting prosecutes targets identified too late, or not selected for action in time to be included in deliberate targeting.[1] It is the active process of identifying, prosecuting, and effectively engaging emerging targets. Dynamic targeting includes prosecution of several categories of targets:

- JFC-designated TST—targets or target set of such high importance to the accomplishment of the joint force commander’s (JFC’s) mission and objectives, or one that presents such a significant strategic or operational threat to friendly forces or allies, that the JFC dedicates intelligence collection and attack assets, or is willing to divert assets away from other targets in order to engage it

[1] The dynamic targeting process is referred to as find, fix, track, target, engage and assess (F2T2EA).

- Targets that are considered crucial for success of friendly component commanders' missions, but are not JFC-approved TSTs. Component commanders may nominate targets to the JFC for consideration as TSTs. If not approved as TSTs by the JFC, these component-critical targets may still require dynamic execution with cross-component coordination and assistance in a time-compressed fashion

- Targets that are scheduled to be struck on the ATO being executed but have changed status in some way (such as fire support coordination measures changes)

- Other targets that emerge during execution that friendly commanders deem worthy of targeting, prosecution of which may not divert resources from higher-priority targets

Time-sensitive targets

A TST is a JFC-validated target or set of targets requiring immediate response because it is a highly lucrative, fleeting target of opportunity or it poses (or will soon pose) a danger to friendly forces. The commander, Air Force forces may recommend TSTs to the JFC. TSTs are prosecuted using the dynamic targeting process described above, but are of higher priority and may require additional coordination with other components or the joint task force. The destruction of these high payoff targets is considered critical for achieving JFC objectives. The JFC is ultimately responsible for TST prosecution and relies upon the component commanders for conducting TST operations.

When using on-call or dynamically re-tasked assets, immediate AI often relies on an offboard sensor such as Joint Surveillance Target Attack Radar System (JSTARS) to provide initial target detection and attack targeting information. Using real-time target information via data-link, response times can be as short as a few minutes, depending on the distances and C2 arrangements involved. Immediate AI requests allow airborne assets to exploit enemy vulnerability that may be of limited duration. It can work particularly well when attacking enemy ground forces on the move in the enemy rear area and provide a responsive use of counterland attack when supporting the surface component. The air support operations center (ASOC) normally coordinates and directs immediate AI requests flown short of the fire support coordination line (FSCL).

The same quick-responsive nature of immediate AI that allows it to take advantage of fleeting opportunities can also have a negative impact on individual mission success. Scheduled missions allow aircrews more time to study the target imagery and to align attack axes to optimize weapons effects. Detailed study can reduce threat exposure and allow mission planners to optimize the weapon's fusing for maximum effect. Preplanning allows better packaging of strike and support assets when required. The bottom line for dynamic targeting of airborne assets is that it should be used in those cases when the need for a short reaction time outweighs the reduced effectiveness that may result when compared with preplanned operations. Moreover, opportunity costs should be considered. Commanders should ensure the benefits of diverting airpower away from a preplanned target outweigh the costs by pondering several variables. **Is it affordable to delay striking a preplanned target? What are the priorities? Will**

diverting airpower to an unplanned target create greater effects or is it less efficient? In short, the payoff of striking a dynamic target should be worth the cost of diverting preplanned assets.

To increase situational awareness during dynamic targeting, C2 elements should ensure that aircrews have the most current information pertaining to the location of SOF, friendly ground forces, and no-strike target lists.

ELEMENTS OF EFFECTIVE AIR INTERDICTION

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In addition to the previously discussed elements of counterland operations, counterland planning and execution should include integration with surface maneuver and command and control (C2), sustained and concentrated pressure on the enemy, and accurate and timely intelligence, surveillance, and reconnaissance (ISR). To what degree each element contributes to the operation varies with the nature of the conflict, geographic location, weather, and characteristics of the enemy.

Integration with Surface Maneuver

An important factor in successful air interdiction (AI) operations is integrating air maneuver with surface maneuver. Planning and conducting AI and surface operations within a coherent framework enhances their synergistic effect in those operations involving air and surface forces. Proper integration can create a dilemma for the enemy commander as he reacts to the resulting combined and complementary effects of air and surface combat power. Two complementary maneuver schemes serve as an example. The first involves airpower fixing enemy surface forces, thus allowing ground forces to engage. Airpower can hold enemy ground forces in place leaving friendly land forces free to maneuver. If the enemy counters surface maneuver with movement, losses from air attack (due to reduced concealment, greater detectability, and increased predictability) may become unacceptable. As a result, measures required to minimize losses from AI leave the enemy more susceptible to defeat by friendly surface forces. The second scheme involves surface forces fixing enemy forces, thus allowing airpower to engage the enemy. An actual or threatened surface advance can force an enemy to respond with counter maneuvers or resupply. By placing sustained pressure on the enemy, surface combat increases target acquisition by flushing the enemy from concealment thereby enabling airpower to destroy enemy forces at a faster rate than can be replaced. Close coordination among all components helps maximize enemy vulnerability to AI.

Mission-type orders allow for the optimum employment of airpower forces by maximizing effects and increasing employment flexibility. For example, using broad guidance, the joint force commander (JFC) may direct theater-wide interdiction of all enemy second echelon forces. The commander, Air Force forces (COMAFFOR) can then conduct a tailored interdiction effort against those forces with specific targeting

guidance being developed at the component or even tactical level. In another example, the surface component commander might indicate to the JFC that delay or disruption of a particular enemy ground force is the highest priority for air support. The COMAFFOR can then determine the best way to achieve those desired effects, since he has the best means for determining how to attack the enemy with airpower. Surface commanders requesting supporting AI should clearly state how it will enable or enhance their operations, listing both the desired effects and effects to be avoided. The latter might include consequences of destroying lines of communications (LOCs) critical to the ground scheme of maneuver or the hazards associated with air-delivered cluster munitions and mines. Airmen at the tactical and operational levels of war, especially those in the field advising the ground component on proper use of airpower, can facilitate the commander's intent process by ensuring that air support requests clearly state the desired effects.

Accurate, timely, and relevant intelligence about the enemy's support characteristics, force structure, and ability to adapt is imperative to successful AI. Intelligence provides information about the enemy's probable course(s) of action, identifies interrelated target systems, allows the COMAFFOR to anticipate enemy actions, and facilitates correct assessment. A prerequisite for planning counterland operations is an understanding of the capabilities and limitations of the enemy and how the enemy is most likely to fight. Accurate intelligence allows commanders to develop achievable objectives, select appropriate targets, apply the appropriate weapon and delivery systems, and keep abreast of the enemy's response. In order to accomplish this, commanders require information systems that facilitate exploitation and dissemination of real-time and near real-time intelligence. Such intelligence is particularly useful in dealing with targets that may have near or immediate effect on surface forces or whose location was not accurately known. AI targets should be identified and then prioritized in relation to their importance in achieving campaign objectives.

Two key characteristics of successful counterland operations are sustained and concentrated pressure on the enemy. AI demands sustained, persistent action. Success or failure often comes down to the balance between the enemy's ability to repair the damage

Sustaining Effects

A thorough assessment of the enemy's ability to reconstitute or work around air interdiction damage is vital to success.

versus friendly ability to inflict more damage to the system being interdicted. Persistence is a critical element in ensuring the prolonged effect of both AI and close air support (CAS). Eventually, resourceful enemies may potentially circumvent even the most prolonged effects of air attack. Effective employment of ISR assets provides critical information to the COMAFFOR on the results of the opening attacks and on the effect achieved over time by airpower operations as a whole. Such information will be used in reattack decisions and in deciding when to attack follow-on targets while the enemy attempts to recover from the original attacks. AI is often directed against replaceable systems (vehicles; weapons; petroleum, oil, and lubricants; communications systems) and repairable systems such as bridges or railroad lines. Therefore, pressure should be sufficient to impede efforts to replace or repair affected targets and cause stress on the entire enemy operation. This requirement applies particularly to operations of long duration, because time normally allows the enemy to restore losses. Attacks on key repair and replacement assets may be advisable if such targets represent the weak link in the enemy's support infrastructure. Concentrating the effects of counterland operations against critical targets is essential due to the generally limited numbers of AI and CAS-capable assets.

CLOSE AIR SUPPORT

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Close air support (CAS) is defined as "air action by fixed- and rotary-wing aircraft 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. Employing ordnance within close proximity of ground troops and the requirement for detailed integration are two characteristics that distinguish CAS from other types of air warfare.

- **Close proximity.** Close proximity does not represent a specific distance. Instead, the word "close" is situational and requires detailed integration and terminal attack control (TAC) based on friendly force proximity to enemy targets. Detailed integration and TAC help ensure engagement of correct targets and mitigation of fratricide. Thus, CAS is not defined by a specific region of an operation, it can be conducted at any place and time friendly surface forces are in close proximity to enemy forces. For example, special operations forces (SOF) operating anywhere in the joint operations area (JOA) may require CAS support if there are friendly troops within close proximity to the enemy forces being attacked.
- **Detailed integration.** The requirement for detailed integration because of fires, proximity, or movement is the determining factor for CAS. Detailed integration describes a level of coordination required to achieve desired effects while minimizing the risk of fratricide—from either surface fires or air-delivered weapons. Because of this level of integration, each element should be controlled in real time to prevent fratricide of ground or air forces. Procedures should be flexible enough so that CAS, surface fires, and the ground scheme of maneuver are not overly restricted. The range at which the preponderance of effects against the enemy shifts from surface fires to airpower is the prime factor (among several) used to define the maximum range requiring detailed integration and a good depth for commanders to consider delineating between CAS and air interdiction (AI).

The joint force commander establishes the guidance and priorities for CAS in the concept of operations, operation plan or campaign plan, air apportionment decision, and by making capabilities and forces available to the components.

The commander, Air Force forces **(**COMAFFOR) is given the authority necessary to accomplish missions and tasks assigned by the establishing commander. For CAS, these responsibilities normally include recommending air apportionment, allocating forces/capabilities made available from the JFC and components including command and control elements of the theater air control system (TACS), creating and executing the air tasking order (ATO), and other applicable actions associated with CAS execution. The COMAFFOR maintains close coordination with the other component commanders to ensure CAS requirements are being met in accordance with JFC guidance.

CAS OBJECTIVES

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Close air support (CAS) provides firepower in offensive and defensive operations, day or night, to destroy, suppress, neutralize, disrupt, fix, or delay enemy forces in close proximity to friendly ground forces. For CAS to be employed effectively, it should be prioritized against targets that present the greatest threat to the supported friendly surface force. Moreover, CAS assets should arrive in a timely manner. CAS that arrives late may be ineffective due to the fluid nature of ground battle.

Almost any enemy threat in close proximity to friendly forces on the modern battlefield is suitable for CAS targeting. However, indiscriminate CAS application against inappropriate targets decreases mission effectiveness, increases the risk of fratricide, and dilutes availability of CAS aircraft to an unacceptable level. Although there is no single category of targets most suitable for CAS application, mobile targets and their supporting firepower (in general) present the most immediate threat to friendly surface forces and thus are prime candidates for consideration. This is especially true when supporting light forces, such as airborne or amphibious units, since they are not able to bring as much organic heavy firepower into battle as heavier mechanized or armored units. CAS provides the surface commander with highly mobile, responsive, and concentrated firepower. It enhances the element of surprise , is capable of employing munitions with great precision, and is able to attack targets that are inaccessible or invulnerable to available surface fire.

The success of CAS during both offensive and defensive operations in contiguous, linear warfare may depend on massing effects at decisive points — not diluting them across the entire battlefield. During large-scale ground operations, there are often more requests for CAS than can be attacked by the available air assets. The centralized command and control of CAS employment is essential to allow the massing of its effects where needed most. This may often be beyond the troops-in-contact range, as CAS missions operating there will have reduced risk of fratricide, and enemy forces destroyed or delayed there are often kept from engaging friendly surface forces. Surface commanders should properly prioritize and focus the firepower of apportioned and allocated CAS at decisive places and times to achieve their objectives. Distributing CAS among many competing requests dilutes the effects of those assets and may result in less, rather than more effective air support to ground forces.

CAS EFFECTS

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When it is necessary to provide troops in contact with supporting fires, close air support (CAS) can devastate enemy forces while spearheading offensive operations or covering retrograde operations. CAS can also be used for harassment, suppression, and neutralization. However, because those effects are typically assigned to surface fire support assets, such use may represent a less efficient use of limited CAS missions. Ground commanders should use their organic firepower when better suited for the task before calling in requests for CAS. However, a ground commander's organic firepower—particularly longer range systems—may not always be the most appropriate fire support asset. Thus, when planned and integrated well, CAS provides desired effects that can be exploited by the maneuver commander. Ultimately, each of the different CAS applications should be weighed against other, potentially more effective, uses for CAS-capable assets such as air interdiction or even strategic attack. CAS generates the following benefits:

- **Facilitate Ground Action.** CAS enhances opportunities for ground commanders to seize the initiative through offensive action. CAS can facilitate the offensive by providing the capability to deliver a wide range of weapons, massed or distributed as necessary, and by creating opportunities to break through enemy lines, protecting the flanks of a penetration, or preventing the counter-maneuver of enemy surface forces. Defensive requirements to blunt an enemy offensive may also dictate the need for close support. CAS can protect the maneuver and retrograde movement of surface forces, protect rear area movements, or create avenues of escape. CAS aircraft may also be used to provide escort and suppressive supporting firepower for air mobile and airborne forces, and to conduct surveillance and security for landing forces or patrol and probing operations.

- **Induce Shock, Disruption, and Disorder.** CAS should be massed to apply concentrated firepower where it is most needed by the ground commander. When massed, CAS has immediate physical and psychological effects on enemy capabilities. Since available assets are usually limited, CAS is applied against targets of immediate concern to surface forces when those forces cannot produce the desired effect with organic weapons alone, when surface forces are committed without heavy organic weapons support, or when the disposition of targets prevents successful attack by surface firepower. When used against enemy targets that are

beyond troops-in-contact (TIC) range, CAS often provides support that is more effective to the ground force due to the decreased risk of fratricide and the reduced interference of CAS with organic surface fires. The task of CAS is to provide selective and discriminating firepower, when and where needed, in support of surface forces.

- **Support Stability Operations.** Stability operations occur during the stabilize and enable civil authority phases of a joint campaign.[1] Unlike the more linear major combat operations which may occur in the seize the initiative and dominate phases, stability operations tend to be based on areas of operations (AOs) rather than traditional fire support coordination measures (FSCMs) such as fire support coordination lines (FSCLs) and coordinated fire lines (CFLs). Ground forces conducting stability and counterinsurgency operations frequently assign the entire AO to subordinate ground echelons in an attempt to operate in a more distributive manner. During stability operations, concerns on collateral damage and civilian casualties create more stringent joint fires rules of engagement (ROE) and clearance requirements. Consequently, counterland operations are often limited to CAS procedures because the ROE dictates that the supported ground commander clear all fires in his AO.

CAS in support of stability operations should be responsive to immediate requests over potentially large AOs. Typically, this diverges from the concept of massing CAS at a specific point, as the more likely scenario is a simultaneous presentation of small targets over a widely dispersed area. Given that CAS missions during stability operations are often supporting small units that are lightly armed, timely response becomes even more critical. By default, in these situations, CAS may be the only method of non-organic fire support available to the ground commander to counter enemy forces they are engaging. In addition to fratricide prevention considerations, minimization of civilian casualties also drives more restrictive ROE during these missions. As such, the number of weapons expenditures tends to be lower than it would be during major combat operations and more restrictions are placed on weapon types.

Finally, CAS support during stability operations can be complicated by multiple supported commanders within the same AO. Although a conventional ground unit may clearly be defined as an AO owner and responsible for all fires within his/her AO, other units such as special operations forces, other government agencies, military reconstruction teams, or logistics forces can and will request CAS for either troops in contact or to service high value targets. Even though the owning ground commander is responsible for establishing priority, effects, and timing of all fires within an AO, this relationship may not always be as clear cut with multiple commanders in the same AO. CAS aircrew may find themselves competing for airspace with other assets in support of the same ground AO. Theater air control system (TACS) elements such as the air support operations center (ASOC), air liaison officers (ALOs), and control and reporting center (CRC) and airborne warning and control systems (AWACS), should make every

[1] JP 5-0

attempt to clarify priorities and supported/supporting command relationships during stability operations to preclude CAS conflicts.

TERMINAL ATTACK CONTROL

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A need for flexible, real-time targeting guidance and fratricide avoidance are critical considerations when conducting close air support (CAS). To integrate air-ground operations safely and effectively, either a joint terminal attack controller (JTAC) or a forward air controller–airborne (FAC [A]) provides terminal attack control (TAC) for CAS missions. Terminal attack control is defined as "the authority to control the maneuver of and grant weapons release clearance to attacking aircraft" (JP 3-09.3, *Close Air Support*).

A JTAC is defined as "a qualified (certified) Service member who, from a forward position, directs the action of combat aircraft engaged in CAS and other offensive air operations. A qualified and current JTAC will be recognized across the Department of Defense as capable and authorized to perform terminal attack control" (JP 3-09.3). The JTAC provides recommendations on the integration of CAS with the ground commander's scheme of maneuver. A JTAC should be trained to:

- Know the enemy situation and location of friendly units and civilians.
- Know the supported commander's target priority, desired effects, and timing of fires.
- Know the commanders intent and applicable rules of engagement (ROE).
- Validate targets of opportunity.
- Advise the commander on proper employment of air assets.
- Submit immediate requests for CAS.
- Control CAS with supported commander's approval.
- Deconflict aircraft and fires from CAS sorties.
- Perform battle damage assessment (BDA).

The FAC(A) is a specifically trained and qualified aviation officer who exercises control from the air of aircraft engaged in CAS of ground troops. The FAC(A) is normally an airborne extension of the tactical air control party (TACP). "A qualified and current forward air controller (airborne) will be recognized across the Department of Defense as capable and authorized to perform terminal attack control" (JP 3-09.3). Only specially trained and certified aircrews are authorized to perform this duty, as it requires detailed knowledge of friendly and target locations, artillery, available aircraft weapons and fuel states, the ability to conduct all three types of terminal attack control, and the flexibility to prioritize and adjust in a dynamic environment. FAC(A)s should receive land maneuver commander clearance, normally through the TACP, before expending or authorizing other aircraft to expend ordnance. The FAC(A) may provide TAC, relay CAS briefings, provide immediate target and threat reconnaissance, and mark targets for attacking aircraft. Threats and weather permitting, the FAC(A) may see well beyond the visual range of ground-based JTACs. The FAC(A) can perform tactical battle management by cycling aircraft through the target area while prioritizing targets in coordination with a JTAC. In this role, the FAC(A) is operating as a tactical air coordinator (airborne) (TAC[A]). The FAC(A) may provide positive identification (PID), collateral damage estimation (CDE), and immediate BDA.

The TAC(A) is an extension of the theater air control system (TACS) air support control agencies. In the absence of Joint Surveillance Target Attack Radar System (JSTARS) or a FAC(A), a TAC(A) may provide communications relay between the TACP and attack aircraft. A two-ship FAC(A) flight, especially in higher threat environments, may divide responsibilities so one aircraft fills the normal FAC(A) role while the second becomes a TAC(A). The TAC(A) expedites CAS aircraft-to-JTAC handoff during "heavy traffic" CAS operations. TAC(A) tasks may include: coordination of CAS briefs and attack times; CAS and FAC(A) hand-offs to terminal attack controllers; relay of threat updates and BDA to C2 agencies; coordination of aircraft and surface fire support; coordination of fixed and rotary wing operations; visual reconnaissance; coordination of indirect fire support to include naval surface fire support (NSFS).

Joint Fires Observer (JFO). A JFO can request, adjust, and control surface-to-surface fires, provide targeting information in support of Type 2 and Type 3 CAS, and perform terminal guidance operations (TGO). TGO are those actions that provide electronic, mechanical, voice or visual communications that provide approaching aircraft and/or weapons additional information regarding a specific target location. The JFO adds joint warfighting capability but cannot provide TAC during CAS operations. Unless qualified as a JTAC or FAC(A), **personnel conducting TGO do not have the authority to control the maneuver of or grant weapons release to attacking aircraft.** JFOs provide the capability to exploit those opportunities that exist in the operational environment where a trained observer could be used to efficiently support air delivered fires, surface-to-surface fires, and facilitate targeting. The JFO is not an additional person provided to a team but rather an existing team member who has received the supplemental proper training and certification. **The intent of a JFO is to add joint warfighting capability, not circumvent the need for qualified JTACs.** JFOs expand

the target set available to ground commanders by passing accurate targeting information to both the JTAC and aircrew.

Special Tactics Team (STT). Air Force STTs are composed primarily of special operations combat control and pararescue personnel. Combat control personnel support SOF ground elements by providing air-ground interface, fire support, target designation, C2 communications, and airfield/helicopter landing zone/drop zone surveys. Some combat controllers are JTAC-qualified.

TYPES OF TERMINAL CONTROL

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There are three types of terminal attack control (TAC) designated as Types 1, 2, and 3 (discussed below). Each type is characterized by a specific set of procedures outlined in JP 3-09.3, *Close Air Support*. The ground commander considers the situation and issues guidance to the joint terminal attack controller (JTAC) based on recommendations from the air liaison officer (ALO) on staff and associated risks identified in the tactical risk assessment. The intent is to offer the lowest level supported commander the latitude to determine which type of TAC best accomplishes the mission. Risk level is not directly tied to a given type of TAC. The three types of control are not ordnance-specific and the tactical situation will define the risk level (e.g., GPS and digital targeting systems used in Type 2 control may be a better mitigation of risk than using non-guided free-fall munitions under Type 1 control). It is important to understand the most important risk mitigation tool is target verification prior to attack. Therefore, when delivering guided weapons, the point designated by the aircraft sensor, or the coordinates entered into an inertial guided weapon, may be more practical factors for risk mitigation as opposed to attack aircraft nose position. Only a JTAC or forward air controller–airborne [FAC(A)] can provide Type 1-3 TAC.

Because there is no requirement for the JTAC to visually acquire the target or attacking aircraft in Type 2 or 3 control, JTACs may be required to coordinate close air support (CAS) attacks using targeting information from an observer or other asset with real time targeting information. The JTAC maintains control of the attacks, making clearance or abort calls based on the information provided by additional observers or targeting sensors. The JTAC should consider the timeliness and accuracy of targeting information when relying on any form of remote targeting.

Technological advances in aircraft capabilities, weapons systems and munitions have provided JTACs additional tools to maximize effects of fires while reducing the risk of fratricide when employing airpower in close proximity to friendly forces. GPS-equipped aircraft and munitions, laser range finders/designators, and digital system capabilities are technologies that can be exploited in the CAS mission area. Regardless of the general guidance listed here, **specific procedures for TAC should always be addressed in theater special instructions (SPINS) or rules of engagement (ROE).** The following discussion provides an operational description of types 1-3 control of CAS:

- **Type 1** control will be used when the JTAC requires control of individual attacks and must visually acquire the attacking aircraft *and* the target for each attack (JP 3-09.3). "Visually acquire" is literally eyes-on or via optics such as binoculars, without the use of third party devices such as laptops or other digital imagery. Analysis of attacking aircraft geometry is required to reduce the risk of the attack affecting friendly forces. Language barriers when controlling coalition aircraft, lack of confidence in a particular platform, ability to operate in adverse weather, or aircrew capability are all examples where visual means of TAC may be the method of choice.

- **Type 2** control will be used when the JTAC requires control of individual attacks and any or all of the conditions exist: JTAC is unable to visually acquire the attacking aircraft at weapons release; JTAC is unable to visually acquire the target; and/or the attacking aircraft is unable to acquire the mark/target prior to weapons release (JP 3-09.3). The JTAC must acquire the target visually or utilize targeting data from a scout, combat observation and lasing team (COLT), fire support team (FIST), joint fires observer (JFO), unmanned aircraft (UA), special operations forces (SOF), CAS aircrew, or other asset with accurate real-time targeting information. Type 2 control may be applicable during certain conditions, such as night, adverse weather, and high altitude or standoff weapons employment. Type 2 control is also applicable when using configured UA or targeting pod sensor aimpoint via remotely operated video enhanced receiver. A JTAC, who can see a laser spot on the target or a real-time feed from a targeting pod, may be better able to deconflict an attack from friendly forces than one relying on visual contact with an attacking aircraft at high altitude. Currently fielded technology has the capability to improve the flow of information between the JTAC and pilot. These tools are an additional means to ensure the destruction of the enemy and prevent fratricide, and in many cases are a more reliable means of aimpoint verification than observing the attacker's nose position.

- **Type 3** control is used when the JTAC requires the ability to provide clearance for multiple attacks within a single engagement subject to specific attack restrictions. Type 3 control does not require the JTAC to visually acquire the aircraft or the target; however, all targeting data must be coordinated through the supported commander's battle staff (JP 3-09.3). During Type 3 control, JTACs provide attacking aircraft targeting restrictions (e.g., time, geographic boundaries, final attack heading, specific target set, etc.) and then grant a "blanket" weapons release clearance to meet the prescribed restrictions. The JTAC will monitor radio transmissions and other available digital information to maintain control of the engagement. The JTAC maintains abort authority. Observers may be utilized to provide targeting data and the target mark during Type 3 control. Type 3 is a CAS TAC procedure and should not be confused with TGO or AI. **Missions attacking targets not in close proximity to friendly forces, and beyond the range requiring detailed integration with surface fires and maneuver, should be conducted using air interdiction (AI) procedures vice CAS.**

JTACs provide the type of control as part of the CAS brief. It is not unusual to have two types of control in effect at one time for different flights. For example, a JTAC may control helicopters working Type 2 control from an attack position outside the JTAC's field of view while simultaneously controlling medium or low altitude fixed-wing attacks under Type 1 or 3 control. The JTAC maintains the flexibility to change the type of TAC at any time within guidelines established by the supported commander. Senior commanders may impose restrictions that prevent subordinate commanders from using certain types of terminal attack control. However, the intent is for senior commanders to provide guidance that allows the lowest level supported commander to make the decision based on the situation. The JTAC maintains abort authority in all cases.

Close Combat Attack. JTACs may encounter situations where they provide targeting information to Army attack aviation assets. In these types of scenarios, attack helicopters may be performing close combat attack (CCA). Once the aircrews receive the situation update brief from the ground commander/observer, they develop a plan to engage the enemy force while maintaining freedom to maneuver. Due to capabilities of the aircraft and the enhanced situational awareness of the aircrews, TAC from ground units or controllers is not required. It is important to distinguish that Army assets conducting CCA are operating as maneuver elements and are responsible for their own clearance of fires through the ground commander. CCA is not synonymous with CAS. JTACs should not expect to provide clearance under these conditions.

Armed unmanned aircraft (UA) Considerations. Clearance of fires and CAS final control for armed UA should be clearly established before combat operations begin.[1] Armed UA procedures should follow the same procedures as other CAS airframes in most cases, but there are situations that require additional consideration. The air support request (ASR) process typically begins when a ground commander requests CAS from the air support operations center (ASOC) through the joint air request net (JARN). The ASR process often works in reverse when an intelligence surveillance and reconnaissance (ISR)-tasked UA locates hostile forces in an area that requires detailed integration with or is in close proximity to ground forces. In this case, the UA operator usually informs the ground commander (through the air support operations center (ASOC) or the direct air support center [DASC]) that a recently discovered target may require CAS as opposed to the ground commander making the request. There are two basic scenarios in which an armed UA could require clearance of fires and final control. These cases all assume that targets identified by a UA meet ROE requirements.

- **Case 1: UA on an ASR tasking in communication with a JTAC who is in communication with the ground force commander.** In this case, standard CAS procedures should be used. The local ground commander clears and gives approval for fires in the target area, and the JTAC provides final control.

- **Case 2: UA on an ISR tasking that is not in communication with ground forces.** In this case, the UA operator should receive approval to terminate the ISR tasking

[1] The USAF refers to some of its larger UAs as remotely piloted aircraft (RPA) to differentiate its operators who have been trained to similar standards as manned aircraft pilots.

temporarily. UA responsibilities within the air operations center (AOC) should transition from the senior intelligence duty officer to the senior offensive duty officer.[2] Overall command and control (C2) should transition from the AOC to the ASOC or DASC. The UA operator should contact the ASOC or DASC to ensure the appropriate ground commander is contacted through appropriate command channels. If the local ground commander has an available JTAC, the ASOC or DASC should provide a C2 and datalink frequency for the UA operator to facilitate clearance of fires.

Terminal attack control and clearance of fires is important to the effective employment of armed UA during CAS. There is an increased chance of fratricide, mid-air collision, and confusion if procedures are not clearly defined. These risks are further increased with the increase of armed UA. Because every conflict is different, these procedures may not apply exactly to every combat situation. The bottom line: **commanders should ensure that the SPINS include clear and precise procedures for armed UA**.

Recent technological advances in weaponry and digital/data link systems have provided significant enhancements to the CAS mission; however, commanders and operators should fully understand the capabilities and limitations of the systems being brought to the fight. Descriptive, concise dialog between the JTAC and aircraft often remains the best means to understand and mitigate the risk and produce the desired effect on target. **It is essential that all CAS participants use standard procedures and terminology** (see JP 3-09.3, *Close Air Support* and AFTTP [I] 3-2.6, *Multi-Service Procedures for the Joint Application of Firepower [JFIRE]*).

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[2] See Air Force Instruction 13-1 AOC, Volume 3 for an expanded discussion on AOC divisions and teams.

CAS EXECUTION WITH NON-JTAC PERSONNEL

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In certain circumstances, the ground commander might require air support when a joint terminal attack controller (JTAC) or forward air controller (airborne) (FAC[A]) is not available but detailed integration with friendly forces fire and movement is still required. Aircrew executing close air support (CAS) under these circumstances bear increased responsibility for the detailed integration required to minimize fratricide and collateral damage normally done by a JTAC/FAC(A). Non-JTAC personnel must clearly state to strike aircraft that they are not a JTAC. In these circumstances, CAS aircrew should assist these personnel/units to the greatest extent possible in order to bring fires to bear.

Due to the complexity of air support, the ground commander must consider the increased risk of fratricide when using personnel who are not JTAC/FAC(A) qualified. The requester must notify/alert his command element when a JTAC or FAC(A) is unavailable to conduct Type 1, 2, or 3 control. If the maneuver commander accepts the risk, the request is forwarded to the CAS controlling agency. This information will alert the CAS controlling agency (e.g., air support operations center; direct air support center; air operations center) that aircrew will be working with non-JTAC personnel. See AFTTP (I) 3-2.6, *Multi-Service Procedures for the Joint Application of Firepower* (JFIRE), for additional discussion.

FRATRICIDE AVOIDANCE

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Fratricide and civilian casualty avoidance is crucial to the effective employment of close air support (CAS). CAS operations are conducted in close proximity to friendly forces; therefore, CAS procedures, training, and scenario rehearsals require particular emphasis on the avoidance of fratricide and civilian casualties. Although occasionally attributed to weapons malfunction, fratricide and civilian casualties are most often the result of confusion on and over the battlefield. Civilian casualties may increase the risk of the ability to achieve strategic, operational, or campaign objectives. Causes include: misidentification of targets, target location errors, target or friendly locations incorrectly transmitted/received, or a loss of situational awareness by joint terminal attack controllers (JTACs), CAS aircrews, or air support request (ASR) agencies. Items that can significantly reduce the likelihood of fratricide and civilian casualties are: sound procedures for friendly force tracking; immediate air requests and clearance of fires; detailed mission planning; realistic training/mission rehearsal; use of friendly tagging or tracking devices; and effective coordination. Civilian casualties should be considered a critical vulnerability, and planners should consider second and third order effects during operational planning.

All participants in the CAS employment process are responsible for the effective and safe planning and execution of CAS. Each participant should make every effort possible to identify friendly units and enemy forces correctly prior to targeting, clearing fires, and weapons release. Combat identification (CID) is defined as “the process of attaining an accurate characterization of detected objects in the operational environment sufficient to support an engagement decision.” Performed in accordance with the rules of engagement (ROE), CID characterizations enable engagement decisions and the subsequent use, or prohibition of use of lethal and nonlethal weaponry to accomplish military objectives. It is critical for all involved in the CAS process to realize that their actions can either prevent or contribute to unintentional or inadvertent friendly fire incidents.

Risk assessment is a critical factor in preventing fratricide and civilian casualties. As the battlefield situation changes, commanders and staffs should make continuous tactical risk assessments. Risk assessments involve the processing of available information to ascertain a level of acceptable risk to friendly forces or noncombatants. Based on the current risk assessment, the supported commander will weigh the benefits

and liabilities of authorizing specific weapons types or a particular type of terminal attack control (TAC). Considerations during risk assessment should include, but not be limited to the following: capabilities of units involved, information flow, uncertainty, communications reliability, battle tracking, targeting information, weather, and ordnance effects. Proximity of friendly troops is also a key factor during risk assessment.

Risk-estimate distances (RED) allow commanders to estimate the danger to friendly troops from a CAS attack. The distances are defined by the probability of incapacitation (PI) to ground troops. Weapon size and distance of impact to ground troops affect PI. Moreover, different surroundings such as target elevation, terrain, buildings, trees, etc., can significantly reduce or increase PI. When there is a .1% (1/1000) chance of incapacitation, the distance is considered danger close. The supported commander must accept responsibility for the risk to friendly forces when targets are inside danger close range. Risk acceptance is confirmed when the supported commander passes his initials to the attacking CAS aircraft through the JTAC, signifying that he accepts the risk inherent in danger close deliveries. When ordnance is a factor in the safety of friendly troops, the aircraft's axis of attack should normally be parallel to the friendly force's axis or orientation. This will preclude long and/or short deliveries from being a factor to friendly forces. See JP 3-09.3, *Close Air Support*, and AFTTP 3-2.6, *Multi-Service Procedures for the Joint Application of Firepower* (JFIRE), for more detailed discussions of risk-estimate distance.

TYPES OF CAS REQUEST

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Types of CAS Request

There are two types of close air support (CAS) requests: preplanned and immediate.

Preplanned Requests for CAS. Preplanned requests for CAS are initiated when the Department of Defense (DD) Form 1972, *Joint Tactical Air Strike Request*, arrives in the air operations center (AOC) in a timely enough fashion to result in a scheduled mission in the air tasking order (ATO). The aircraft flying the missions are scheduled on the ATO for a particular target/area, time on target (TOT), and a weapons load specifically tailored to match the desired effects specified in the DD 1972, which normally coincides with the anticipated time when CAS will be needed most by the ground component. Preplanned requests for CAS will result in one of two types of mission: scheduled or on-call (discussed below).

Immediate Requests for CAS. Immediate requests for CAS are those requests that were not made early enough during planning cycles to result in a scheduled ATO mission. Immediate requests may result from unanticipated or unplanned needs on the battlefield, often of an emergency nature, that require diverting, rescheduling, or dynamically retasking aircraft from other missions. Without the benefit of thorough preplanning, immediate requests may increase the risk of fratricide. Immediate requests can be filled with ground or airborne alert CAS, if available, or by diverting aircraft from preplanned CAS (or even air interdiction [AI]) missions that are of lower priority.

Types of CAS Missions

Scheduled CAS. From a planner's perspective the preferred use of a CAS asset is to have it preplanned and pre-briefed in order to provide participants an opportunity to walk through the operation, achieve familiarity with terrain, airspace restrictions and procedures, and to identify shortfalls. Scheduled missions will normally have a specific contact point at a specific time to expect handoff to a joint terminal attack controller (JTAC) or a forward air controller-airborne (FAC[A]). Scheduled CAS missions are the most likely to have good intelligence on the expected type of target, resulting in a better munitions-target match. Although joint doctrine states that a specific target must be

identified when requesting scheduled CAS, the reality of dynamic operational environments makes identifying a CAS-eligible targets days in advance very difficult.

On-call CAS involves putting the aircraft on ground-based or airborne alert (often listed as GCAS [ground based alert] or XCAS [airborne alert] in the ATO) during a preplanned time period when the need for CAS is likely, but not guaranteed. During major operations when there is competition for counterland resources, on-call CAS can result in a less than optimum use of resources. Because these CAS assets may or may not actually employ against the enemy, it is important that on-call CAS assets have a backup target or a plan to transition to AI within the ground commander's area of operations.

In a situation in which the air component knows the joint force commander has placed

THE ORIGINS OF "PUSH CAS"

The successful DESERT STORM tactic of "push CAS" can trace its origins at least back to World War II. By 1944, the USAAF and RAF in Italy had perfected a method of flowing fighters into the CAS area on a regular, prescheduled basis. This system, known as "cab rank" for its similarity to a line of taxicabs waiting for passengers, provided a constant flow of fighters overhead for the ground controllers, then known as "Rovers." If not needed for close air support, these missions pressed on to a preplanned backup target, typically a bridge or other interdiction target of known value to the enemy. The cab rank system was possible because of Allied air superiority and large numbers of counterland assets, and provided the ground force with very responsive air support. Cab rank response time was as little as a few minutes, while traditional CAS missions that were only scheduled in response to specific requests by the ground force might not arrive for several hours.

CAS as a high priority in the air apportionment decision, but the land component has few requests for CAS, the AOC can use "push CAS" or "pull CAS" to meet both the JFC's intent, and the land component's un-forecasted need for CAS. Both methods provide on-call CAS when needed, but differ in where the aircraft are when the need is recognized.

- **Push CAS** represents a proactive method of CAS that differs from the request-driven pull CAS method. Push CAS provides the CAS already on station, in a contact point, awaiting tasking. While similar in concept to other preplanned CAS missions, push CAS differs because it is planned and often flown before the actual request for CAS is made by the supported ground component. The term push refers to the fact that CAS missions are "pushed" forward to the air support operations center (ASOC), direct air support center (DASC), FAC(A), or JTAC before the formal

CAS request is made; those assets not needed for CAS should be pushed to preplanned backup targets so the sorties are not wasted. Push CAS works best in an environment where many CAS targets are available, so the assets involved will likely have a lucrative target to attack. Although push CAS significantly cuts response times, the number of sorties required is often high and the advantages gained must be weighed against the other potential uses for these assets (such as interdicting known targets). Therefore, planners should regularly assess how much push CAS to use based on such factors as available assets, existing targets, and the ground scheme of maneuver.

- **Pull CAS** has the aircraft on ground alert, awaiting the need to be recognized before the aircraft launch. The term pull refers to the fact that CAS missions are "pulled" from ground alert, after the formal CAS request is made. Pull CAS works best in an environment where few CAS targets are available, so the assets involved will not need to fly until targets are found. Therefore, planners should regularly assess how much CAS is required based on such factors as available assets, existing targets, and the ground scheme of maneuver. For pull CAS to be most effective the ASOC should be delegated launch and divert authority by the AOC.

There are several factors to consider before diverting counterland aircraft for immediate CAS requests. First, the aircrew must be CAS qualified for all but emergency situations. To ensure target destruction and fratricide avoidance, CAS requires extensive knowledge and familiarity with specialized CAS procedures. Second, the aircrew should have suitable mission materials such as required maps, code words, and communications gear. Finally, CAS aircraft should have appropriate ordnance—fusing and weapons effects are critical factors when attacking targets in close proximity to friendly forces, and especially so in urban environments or where avoiding collateral damage is at a premium.

CONDITIONS FOR EFFECTIVE CAS

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Effective close air support (CAS) requires proper training, equipment, and an understanding of the strengths and limitations of airpower. In addition to air superiority, joint complementary operations, appropriate munitions, and favorable environment, the following factors are crucial to the effective conduct of CAS.

Planning and Integration. Effective CAS relies on thorough, coherent planning and detailed integration of air support and ground operations. The ability to mass CAS at a decisive point and to provide the supporting fires needed to achieve the commander's objectives is made possible through detailed integration with ground forces. To achieve this detailed integration, it is critical that the ground liaison detachments (GLD) are in contact with their parent battlefield coordination detachment (BCD), and have detailed contact information for units requesting CAS, in order to develop better briefings for aircrews. The preferred use of a CAS asset is to have it pre-planned and pre-briefed. Training and rehearsals provide participants an opportunity to practice operations/procedures, gain familiarity with the terrain, identify airspace restrictions, and discover any shortfalls. Participants should include aircrews, ground forces, liaison elements, and command and control (C2) agencies such as the air support operations center (ASOC) and direct air support center (DASC).

Integrated C2 Infrastructure. CAS requires an integrated, flexible C2 structure to identify requirements, request support, prioritize competing requirements, task units, move CAS forces to the target area, provide threat warning updates, enhance combat identification (CID) procedures, etc. Accordingly, C2 requires dependable and interoperable communications among aircrews, air control agencies, joint terminal attack controllers (JTACs), ground forces, requesting commanders, and fire support agencies. Any airspace coordinating measures and fire support coordinating measures should allow for timely employment of CAS without adversely affecting other fire support assets.

Flexible and responsive C2 permits requests for CAS, coordinated with the appropriate agencies, to be originated at any level of command within the supported surface force or by elements of the theater air control system (TACS), such as air liaison officers (ALOs) and JTACs. During stability operations, additional restrictions may be imposed such as increased focus on collateral damage estimation (CDE) or more restrictive rules

of engagement (ROE) which may result in decreased flexibility. The interval of time between a unit's request for air support and the delivery of the supporting attack is a critical factor in CAS effectiveness. Prompt response times allow a commander to exploit fleeting battlefield opportunities and to survive in a defensive situation. The commander, Air Force forces (COMAFFOR) may grant launch and divert authority of scheduled CAS assets to the ASOC to facilitate reduced response time. Diverted airborne aircraft from lower priority missions may also be used. However, a balance is required between the most effective use of resources and their response times. Effective C2 also enhances the ability to integrate CAS with surface operations, coordinate support, and update or warn of threats to CAS assets. The depth at which the ASOC will control operations depends a great deal on the ability to both communicate with forces and maintain situation awareness on targets, threats, and other factors. The authority to redirect aircraft to or from missions beyond the fire support coordination line (FSCL) should remain centralized at the AOC, while the authority to flow CAS assets to and from shallow air interdiction (AI) targets short of the FSCL is often delegated to the ASOC or tactical air control party (TACP). An ASOC is normally tasked to support an Army unit but can also support units from other organizations (e.g., special operations, coalition forces). It may also augment other missions requiring airspace control (e.g., counterthreat operations and humanitarian efforts). The placement of the ASOC with Army or special operations echelons under conditions of non-traditional support requires a particular focus on joint capabilities to control the airspace, integrate fire support assets, provide high-fidelity intelligence, surveillance, and reconnaissance (ISR), communicate critical weather forecasts and reports, and to provide airlift support to ground maneuver forces.

Since CAS operates in close proximity to friendly surface units, reliable communications are mandatory. JTACs normally provide targeting instructions, final attack clearance, and fratricide avoidance instructions to CAS aircraft. Forward air controllers (airborne) (FAC[A]s) can also provide this capability and are normally in contact with JTACs to determine targeting, ground scheme of maneuver, coordination measures, and details on the location of friendly forces. Since CAS requires the highest level of integration between air and ground maneuver, specific communications procedures and training are required for air and ground terminal attack controllers and CAS aircrew. This process can be expedited if the ASOC provides an area of operations (AO) update prior to pushing the aircrew to the FAC(A) or JTAC. Standard procedures and terminology are published in JP 3-09.3, *Close Air Support* and AFTTP [I] 3-2.6, *Multi-Service Procedures for the Joint Application of Firepower [JFIRE]*), and may be modified by theater and local standards.

CAS requires interoperable communications between air and surface forces. Mismatched equipment slows coordination of fire support, and lack of secure or frequency-agile radios may lead to compromised, garbled, or noncommunicated mission data. Such simple errors as having the air and surface components deploy with different codes or frequencies for their communications equipment can delay the proper execution of CAS. As with the other aspects of CAS, the only way to ensure

interoperable communications in war is to conduct fully integrated exercises during peacetime.

Target Marking. CAS effectiveness is greatly improved with timely and accurate target marks. Target marking builds situational awareness, identifies specific targets in an array, reduces the possibility of fratricide, and facilitates terminal attack control. When commanders or planners foresee a shortfall in ability to mark for CAS, they should request that capability during the planning phase. Marking can identify both friendly and enemy positions in addition to being overt or clandestine.

Target marking can be accomplished through various means, including smoke rockets or rounds, laser designation, and flares.

Cross Domain Synergy

Timely and accurate marking can greatly increase the accuracy of CAS attacks and also reduces the chances of fratricide. With the use of low light and infrared systems becoming more widespread, the use of marking devices in those spectra can be more effective than visible target marking, depending on how the aircrew actually acquires the target and employs ordnance on it. When marking targets, JTACs must be aware that there is a potential risk of highlighting their position to the enemy.

Streamlined and Flexible Procedures. CAS should be responsive to be effective. Responsive CAS allows airpower to exploit fleeting battlefield opportunities. Because the operational environment can be extremely dynamic, the CAS C2 system must also be flexible enough to rapidly change targets, tactics, or weapons. The requestor is usually in the best position to determine fire support requirements. Techniques for improving responsiveness include:

- ✪ Effective planning and rehearsal between air and ground units.
- ✪ Using forward operating bases (FOBs) or forward operating locations near the AO.
- ✪ Placing aircrews in a designated ground or airborne alert status.

- Delegating launch and divert authority to subordinate units.

- Positioning JTACs and air liaison officers (ALOs) to facilitate continuous coordination with ground units, communication with aircraft, and observation of enemy locations.

Flexible and responsive procedures are critical for effective employment of CAS. The tactical employment of CAS is centrally controlled by the ASOC and decentrally executed at the tactical level. Launch and divert authority of scheduled CAS assets at the ASOC or airborne controlling agency provides reduced response time. Aircraft diverted from lower priority missions may also be used; however, a balance is required between rapid response and efficient use of limited assets. Effective C2 also enhances the ability to integrate CAS with surface operations, coordinate support, and update or warn of threats to CAS assets.

Requests for CAS, coordinated with the appropriate agencies, may be originated at any level of command within the supported surface force. Regardless of the intensity of the conflict, the ASOC operates the joint air request net (JARN) to receive air support requests from the TACPs supporting the ground commanders. The air request net permits the TACP at each level of command to review the CAS requests as it goes up to the ASOC. This stepping-stone approach allows intermediate ground commanders to filter low priority requests (or requesting units) or use other fires to attack the target, ensuring that only the highest priority CAS requests are reviewed at the ASOC. Because CAS sorties are a high-value and limited asset, ground commanders at each level should prioritize where and when to employ CAS to maximize its effectiveness on the battlefield. The ASOC may develop abbreviated message and request formats to speed the flow of information between C2 nodes. If conducting detached, distributed, or autonomous operations, special operations forces may set up unique procedures with the ASOC or AOC to facilitate requests for air support.

ANNEX 3-03 COUNTERLAND OPERATIONS

COMMAND AND ORGANIZATION (COUNTERLAND)

Last Updated: 16 April 2014

Counterland operations using advanced sensors, weapons, and information technology give Airmen an unmatched capability to achieve desired effects against an enemy. Although counterland operations continue to become more capable, these technological advantages may be ineffectual unless commanders and their staffs understand the complex command and control (C2) mechanisms associated with these operations.

The commander, Air Force forces (COMAFFOR) authority, guidance, and responsibilities are assigned by the joint force commander (JFC) and include, but are not limited to, recommending air apportionment to the JFC as well as planning, coordinating, allocating, and tasking airpower based on the JFC's apportionment guidance. Since there may rarely be enough counterland capable assets to meet all demands, a single air component commander can best ensure the unity of effort required for optimal use of those assets; designating a COMAFFOR adheres to the principle of unity of command.

The COMAFFOR is normally the supported commander for the JFC's overall air interdiction (AI) effort. When designated as the supported commander, the COMAFFOR will conduct theater-wide or joint operations area (JOA)-wide AI in direct support of the JFC's overall theater objectives. The JFC sets overall theater priorities, which guide air component objectives and determine the level of support that air and ground maneuver will provide each other. Based on the JFC's guidance, the COMAFFOR will normally establish the specific priorities for theater-wide AI and will apply these priorities to AI targets located both outside of and inside any surface areas of operations (AOs). Surface commanders can determine specific AI targets or, more preferably, provide requested effects to the air component that allow more leeway in tactical mission planning and a more efficient use of the apportioned airpower. This way, the COMAFFOR can best determine how to support surface commanders who, in turn, will receive more effective air support.

The intent of centrally controlling airpower is to provide the effectiveness against all relevant targets, consistent with the theater commander's strategy. When the number of productive targets exceeds airpower's ability to attack them, centralized control ensures priority targets are engaged regardless of whether they were nominated by an air or surface component. It is important to remember that all components support the

JFC's overall strategy—there should not be great disparities between the various components' priorities for airpower as long as the overall objective remains in view.

Throughout the entire process, close air support (CAS) operations remain under the control of the air component while supporting the surface component. Priorities and intent for CAS and surface maneuver operations come from the JFC. The JFC apportions CAS and air interdiction (AI) based on his overall strategy and COMAFFOR recommendation. The COMAFFOR allocates CAS sorties to the various functions, areas, and missions to support the JFC's apportionment decision and assigns CAS and AI missions to units via the air tasking order (ATO). Ground force commanders, having requested CAS in advance of operations as part of their overall concept of operations, distribute the allocated CAS to ground forces based on anticipated prioritized requirements. While the ground force commander is normally the supported commander for CAS, direct control of CAS missions rests with the Air Force's air support operations center (ASOC), tactical air coordinator (airborne) (TAC[A]), forward air controller (airborne) (FAC[A]), and joint terminal attack controllers (JTACs).

Effective CAS C2 begins with a clear understanding of command relationships within the affected theater. The theater air control system (TACS) is the Air Force element of the joint theater air-ground system (TAGS) and is the COMAFFOR's means of commanding and controlling available forces. Air Force elements of the TACS assigned with ground units are under the operational control (OPCON) of the COMAFFOR, tactical control (TACON) of the combined/joint force air component commander (CFACC/JFACC), and operate in direct support of their assigned ground echelon. This command relationship assumes a COMAFFOR who is also the CFACC/JFACC. In cases where another service or coalition partner serves as the CFACC/JFACC, TACS elements remain OPCON to the COMAFFOR even though TACON may pass to the CFACC/JFACC. The direct support relationship remains the same. It is this OPCON/TACON relationship with the COMAFFOR/JFACC/CFACC that enables an ASOC to be co-located with a ground echelon and have the delegated authority to control air component assets flying in direct support of ground forces.

The surface commander's aligned TACS elements distribute allocated CAS sorties according to the surface commander's scheme of maneuver. The portion of the TACS in direct support of the surface commander and his subordinate echelons ensures airpower is integrated with the ground scheme of maneuver. The air liaison function should also guide the ground commander in the optimum distribution of CAS among his various units; keeping in mind that airpower is most effective when concentrated at the decisive points within the surface commander's AO.

To create synergy with special operations forces (SOF), the combination of SOF and airpower requires cooperative support relationships. Within a joint special operations area (JSOA), the joint force special operations component commander (JFSOCC) is the supported commander for CAS and AI. At the request of the JFSOCC, the COMAFFOR provides elements and C2 nodes to SOF. This may include placing a

liaison or C2 element with the JFSOCC, joint special operations task force, or other SOF elements.

There may also be occasions where the JFSOCC is a supporting commander for AI sorties. Whether operating under control of the COMAFFOR or the JFSOCC, SOF and air maneuver elements must be closely coordinated to ensure synchronization and prevent fratricide. SOF aviation and surface assets are integrated closely in all joint air operations, from planning through execution. To ensure this, the JFSOCC provides the COMAFFOR a special operations liaison element (SOLE) to coordinate, synchronize, and deconflict SOF operations with COMAFFOR forces.

Command relationships below the level of the COMAFFOR are exercised using the TACS. Decisions, such as the degree of battle management authority delegated to subordinate command elements, must balance between the commander's intent, communications connectivity, time constraints, and access to information. As with all C2, the COMAFFOR must clearly state what level of decision-making authority is possessed by subordinate TACS elements to avoid confusion.

THEATER AIR GROUND SYSTEM (TAGS)

Last Updated: 16 April 2014

The digitalization of the operational environment has improved the ability of the commander, Air Force forces (COMAFFOR) to command airpower. The speed and non-linear aspects of modern warfare, as well as the precision of today's weapons, dictate close coordination on the battlefield among the joint force commander's (JFC's) components. When all elements of the Services and special operations command and control (C2) systems integrate, the entire system is labeled the theater air-ground system (TAGS).[1]

Within the TAGS, the theater air control system (TACS) is the COMAFFOR's mechanism for tasking and controlling theater airpower. It consists of airborne and ground elements to conduct tailored C2 of counterland operations. The COMAFFOR must ensure all elements of the TACS are in place and the various liaison positions throughout the command chain filled prior to, or as soon as possible after, the start of an operation or campaign. The structure of the TACS should reflect sensor coverage, component liaison elements, and the communications required to provide adequate support. **The TACS provides the COMAFFOR the capability to centrally plan and control joint air operations through the air operations center (AOC) while facilitating decentralized execution through the subordinate elements of the TACS.**

Ground-Based C2 Elements

Air operations center (AOC). The AOC is the senior C2 element of the TACS and includes personnel and equipment from all the necessary disciplines to ensure the effective conduct of air component operations (e.g., communications, operations, intelligence, etc.). The AOC remains under command of the COMAFFOR and is the focal point for tasking and exercising operational control (OPCON) over Air Force forces

Air support operations center (ASOC). The ASOC is the primary control agency of the TACS for execution of airpower in direct support of Army or joint force land component operations. As a direct subordinate element of the AOC, the ASOC is

[1] For discussions with graphics of each service's TAGS element see ALSA publication AFTTP(I) 3-2.17, *TAGS*.

responsible for the direction and control of air operations in its assigned area (normally short of the fire support coordination line (FSCL) requiring integration with other supporting arms and ground forces. The ASOC is collocated with the division joint air ground integration center to control operations in the Division-assigned areas, although an ASOC may be collocated with the corps headquarters to control Corps-assigned or areas unassigned to a tactical headquarters. The ASOC coordinates operations with the assigned tactical air control parties (TACPs) and the AOC. The primary functions of the ASOC include, but are not limited to:

- Executes the air tasking order (ATO) as directed by the COMAFFOR/joint force air component commander (JFACC) to meet the ground commander's objectives by coordinating and integrating airpower in support of air component operations.

- Provides procedural control of CAS aircraft operating in the area of operations (AO) inside the FSCL. Provides procedural control of other air component aircraft as required.

- Establishes, maintains, and operates the autonomous reach-forward and reach-back communications architecture/infrastructure necessary for mission execution, to include the joint air request network (JARN).

- Provides decentralized execution of immediate air support in coordination with the established ground commander's weight of effort and priority of fires. Obtains clearance of fires from the appropriate fires echelon.

- Integrates, coordinates, directs and controls other air component missions, as required, within its assigned area (primarily inside the FSCL) in direct support of land maneuver objectives, and as directed by the COMAFFOR/JFACC.

- Coordinates air missions that fly within the ASOC's control area but do not directly support the ground component and other supporting arms activities to deconflict with ground force maneuver and fires, in addition to receiving target and threat updates.

- Assists with time-sensitive targeting and friendly force location information to CAS, AI, suppression of enemy air defenses (SEAD), airlift/airdrop, intelligence, surveillance, and reconnaissance (ISR), information operations (IO), and personnel recovery missions within their AO.

- Assists the division air liaison officer (ALO) with advising the ground maneuver staff on the proper integration of airpower during execution, to include CAS employment, target nominations for those AI and SEAD missions that support the ground force, and that part of airborne ISR and airlift that directly supports the land component.

Located within the supported ground commander's AO, during major operations the ASOC's designated area typically extends to the FSCL for actual control of mission execution, and may extend to the Corps' forward boundary for planning and advisory purposes. The AOC will normally delegate launch or divert authority for alert CAS missions to the ASOC, providing a faster response time when air support is needed. The decision to delegate re-targeting authority to the ASOC for specific AI missions inside the FSCL will depend on actual circumstances, including the timeliness required for getting desired effects on target. Unless specifically delegated, however, targeting authority for all AI missions remains with the AOC.

OPERATION ENDURING FREEDOM THEATER AIR CONTROL SYSTEM

During the initial stages of Operation ENDURING FREEDOM, there was no conventional Army Corps deployed to Afghanistan. Thus, an ASOC was not deployed to handle the CAS and AI/TGO centric air war in Afghanistan. Prior to March 2002, when land forces consisted of only limited numbers of Special Forces (SF) Operational Detachment Alphas (ODAs) deployed in Afghanistan, the lack of an ASOC had little effect on air operations. In March 2002, Operation ANACONDA signaled a change from Special Operations Forces (SOF) centric operations, to conventional land force operations. However, the conventional forces used in Operation ANACONDA were a Division (-), not a Corps…thus, still no ASOC deployed to Afghanistan. This hampered airpower in a number of different ways. Real-time target updates, target prioritization for air assets, and aircraft deconfliction in the target area were often accomplished solely by on-station FAC(A)s. The lack of an ASOC caused counterland assets to spend valuable time and fuel looking for correct/any information on the ground order of battle. Moreover, mission essentials such as frequencies to contact ground forces, preliminary 9-line briefings, or any target information other than a set of friendly coordinates were lacking. These shortcomings hampered the integration required to ensure efficient counterland operations.

Air support operations group (ASOG) and air support operations squadron (ASOS). The COMAFFOR presents TACS capabilities to ground forces through ASOGs and ASOSs. The ASOG is provided to a corps and the ASOS is provided to a division. These are variable-sized organizations that provide air support liaison, planning, and execution capabilities. The exact makeup of personnel and capabilities varies depending upon the mission assigned to the corps or division and the level (operational or tactical) at which the corps or division is operating. The ASOG provides a liaison capability at corps and may also provide the nucleus of the joint air component coordination element (JACCE). When corps is designated as the land component senior tactical echelon then the ASOC may be presented at corps and the AGOG will be augmented with the necessary ASOS capabilities.

The ASOC is normally sourced and formed from an ASOS and the ASOS commander is typically dual-hatted as the ASOC. In this dual role, the ASOC director normally exercises OPCON and administrative control (ADCON) as delegated from the COMAFFOR. Further, when operating within a joint environment, the ASOC director normally exercises TACON of joint forces made available for tasking. The ASOC director usually acts as the Division ALO and the COMAFFOR's primary representative to the senior tactical level ground commanders. Air Force ASOCs do not deploy independently, and rely on their associated ground forces for much of their logistics support. They may be tailored in size depending on the task and character of the conflict.

Joint Air-Ground Integration Center (JAGIC)

In recent years, numerous Service and joint after-action reports and lessons learned from real-world operations have highlighted problems with airspace control, fires and effects integration. The JAGIC is designed to enhance joint collaborative efforts to deconflict joint air-ground assets. Establishing the JAGIC within the Army division tactical operation center co-locates decision making authorities from the land and air component with the highest level of situational awareness. To support the maneuver commander's concept of operations, the JAGIC collaborates to more effectively execute the mission and reduce risk at the lowest levels. It includes an AF ASOC, appropriate TACP, highest echelon Army Fires Cell, AC2, and other Army or special operations Command and control or liaison elements. When airspace control is combined with the joint integration of intelligence, targeting and fires, the commander can employ intelligence, surveillance, and reconnaissance (ISR) assets such as unmanned, fixed and rotary wing aircraft effectively. The commander can also leverage joint ISR capabilities to find, track and target the enemy and more rapidly decide, target, deconflict and precisely engage emerging high value TSTs.

Joint Air Ground Cell Concept of Employment, August 2011

NOTE: In 2013, the name Joint Air-Ground Integration Cell (JAGIC) was changed to Joint Air-Ground Integration Center (JAGIC) in order to better align with Army doctrine's limited number of 'cell' possibilities

Three principles should be considered when employing an ASOC. First, an ASOC should not be divided other than to relocate it. The ASOC derives synergy and efficiency from a group of highly trained Airmen working together in concert. Second, the ASOC should be located in a relatively secure location. If taken out through enemy action, friendly ground forces will lose a significant force multiplier. However, security should be weighed against radio limitations. In order to control airpower, an ASOC needs the ability to communicate with aircraft. Thus, the third principle is that the ASOC should be located where it can maintain line of sight communications with aircraft to its maximum operating depth. While high frequency and satellite radio enhance the range of the JARN, many aircraft communications are restricted by several factors. Radio power, antenna size, etc., are factors that impact communications ranges. Terrain is another

consideration. If located in a valley, the ASOC's communication range is reduced because of line-of-sight restrictions.

Control and reporting center (CRC). The CRC is a deployable ground based C2 element that supports air operations execution. The CRC provides the C2 of air operations by managing, disseminating, and assigning missions as specified in the ATO. The CRC can relay current target information to the ingressing CAS aircraft and receive battle damage assessment (BDA) from egressing aircraft for immediate relay to the ASOC.

The CRC performs centralized C2 of joint operations by conducting threat warning, battle management, weapons control, combat identification, and strategic communications. It can facilitate decentralized execution of air defense and airspace control functions by detecting and identifying hostile airborne objects or by scrambling and diverting air defense aircraft. In a limited capacity, the CRC can relay AOC/ASOC information to and from aircraft. The CRC integrates a comprehensive air picture via multiple data links from air-, sea-, and land-based sensors and surveillance and control radars.

Airborne C2 Elements

Airborne C2 manages airborne assets operating beyond the normal communication coverage of ground TACS elements and can act either as a self-contained airborne command post or as a relay for ground-based command centers such as the ASOC. With properly trained aircrew, airborne C2 performs various AOC and ASOC functions to expedite C2 while extending the range of radio communications of C2 nodes. Moreover, airborne C2 platforms ensure continuity of operations in the event that elements of the TACS are not yet deployed or have been disabled. Attack aircraft checking in for CAS or AI targets within an AO often communicate with airborne C2 opposed to talking directly with the ASOC, due to radio and line-of-sight limitations. The E-3 Airborne Warning and Control System (AWACS), the E-8 Joint Surveillance Target Attack Radar System (JSTARS), and CRCs can act as an extension of the AOC/ASOC and function as a key link in the C2 network for counterland operations.

- **Joint Surveillance Target Attack Radar System.** JSTARS is an integrated Army-Air Force, airborne C2 platform. It provides deep look, ground moving target indicator radar for real-time detection of moving surface targets, rotating antennas, and low, slow-flying fixed and rotary wing aircraft and synthetic aperture radar for stationary targets. The system provides ground situational awareness data to multiple air and ground C2 nodes.

- **Airborne Warning and Control System (AWACS).** AWACS is an airborne element of the TACS and is normally the COMAFFOR's first tactical C2 element to arrive in the theater of operations. It is tasked with detecting airborne moving objects and providing tactical C2 of forces in an assigned AOR. Its primary mission is to

COUNTERLAND OPERATIONS AT AL KHAFJI

During the evening of 29 January 1991, the Iraqi Army set elements of three divisions in motion southward out of their static positions in occupied Kuwait. While their ultimate objectives are not known, there is no question that all three advances were aimed at engaging coalition forces, with the largest ground battle developing in the Saudi town of Ra's al Khafji. As news of the initial contacts with Iraqi ground forces flowed into the air control center at Riyadh, additional sorties by E-8 JSTARS surveillance aircraft and fighters armed for air interdiction were ordered.

While Joint STARS located, tracked, and provided vectors to the columns of advancing Iraqi vehicles, flights of fighters, bombers, attack aircraft, and attack helicopters from all of the Services closed in for the kill. Close air support was flown in and around Khafji itself in support of engaged coalition ground forces, resulting in heavy losses to the Iraqi 5th Mechanized Division. Further north, the other two lines of Iraqi advance suddenly found themselves very exposed, with their own movement serving only to highlight themselves as targets. Coalition air interdiction missions took full advantage of this, using a variety of night vision devices and precision guided munitions to inflict even greater damage and stop the Iraqi advance. After losing hundreds of vehicles and taking thousands of casualties, the Iraqis abandoned the attack as a costly failure. Airpower assets like the E-8 Joint STARS (below left) were key in achieving the results depicted in photograph to the right.

conduct air surveillance, identify airborne objects, and control air operations. AWACS provides the deep look, capability to support offensive and defensive air operations. It provides low-level and extended radio coverage for the control of air

operations. AWACS will perform these roles as the primary C2 extension of the AOC, until such time that the CRC can be employed.

- **Unmanned aircraft (UA).**[2] Besides their proven ISR, target cueing, and weapons capability, UAs can act as a communications link when equipped with appropriate communications gear. This can be very useful in small-scale operations or stability operations when low-supply and high-demand aircraft such as AWACS or JSTARS are unavailable. UAs should be treated similarly to manned systems with regard to the established doctrinal warfighting principles. Like manned aircraft, the operation of UAs should adhere to the guidance contained in this publication. While the JFC retains the authority to determine the use and control of UA forces, there are some unique issues for planners and commanders to consider when employing these systems.

Liaison Elements

Effective liaison coordination is a crucial enabler to successful counterland operations. Both the other service and component liaisons in the AOC, and the COMAFFOR's liaisons to the other services/components, play a critical role in enabling successful counterland operations. A description of some liaisons follows.

- **Battlefield coordination detachment (BCD).** The commander, Army force's (COMARFOR's) liaison element to the COMAFFOR/JFACC is the BCD located in the AOC. The BCD facilitates the direct coordination between tactical air and Army units for scheduled CAS planning. The BCD also processes the COMARFOR's AI target nominations and acts throughout planning and execution to ensure proper representation of ground component priorities in the overall process. Moreover, the BCD should inform the Army Force Commander of which nominated targets that were or were not included on the target list for incorporation into the ATO, and the approval status of preplanned CAS requests. This feedback loop is critical, as land commanders must know which requested targets did/did not meet the JFC's priority requirements for air attack. During the execution process, the BCD provides current land picture information to the AOC on both friendly and enemy ground forces.

- **Ground liaison detachment (GLD).** The GLD is a subordinate element of the BCD, whose primary function is to provide tactical level liaison between land elements and air elements providing air support to the joint force land component commander (JFLCC). GLDs are usually assigned to air wings or squadrons where they provide the following functions: assists tactical planning coordination between the flying unit and supported ground unit(s), briefs aircrew on the ground tactical situation, and relays mission results to the BCD.

- **Naval amphibious liaison element (NALE).** The commander, Navy forces (COMNAVFOR) provides the NALE to the COMAFFOR's AOC. The NALE is

[2] The USAF refers to some of its larger UAs as remotely piloted aircraft [RPA] to differentiate its operators who have been trained to similar standards as manned aircraft pilots

responsive to the AOC on matters pertaining to Navy and Marine amphibious operations. The NALE processes COMNAVFOR requests for air support and monitors and interprets the maritime battle situation for the AOC.

- **Marine liaison element (MARLE).** The MARLE is responsive to the COMAFFOR/JFACC on matters pertaining to Marine Corps operations. The MARLE provides feedback to organizations in the AOC on current and future joint air operations concerning integration of force requirements.

- **Special operations liaison element (SOLE).** The SOLE is a team provided by the joint force special operations component commander (JFSOCC) and attached to the COMAFFOR/JFACC to coordinate, synchronize, and deconflict special operations air, surface, and subsurface operations with conventional air operations. The SOLE director places SOF ground, maritime, and air liaison personnel in divisions of the AOC providing a SOF presence that is aware of the activities of SOF units in the field and visibility of SOF operations in the ATO and the airspace control order (ACO). The SOLE is the focal point in the AOC for CAS requests for SOF CAS requests. In this role the SOLE coordinates appropriate fire support coordinating measures, targeting, and airspace to integrate and synchronize fires to avoid duplication and fratricide.

- **Air Force liaison element (AFLE).** If the COMAFFOR is not the JFACC, then AFLEs are presented to the other Service component designated JFACC as a tailored organization that provides interface with the COMAFFOR. This interface facilitates better coordination and synchronization of Air Force assets supporting joint air operations. AFLE personnel are selected for their battle management expertise and knowledge of C2 concepts and procedures. Additional personnel specializing in the capabilities and tactics of aircraft, weapons systems, intelligence, and other specialty areas augment the AFLE cadre.

- **Joint air component coordination element (JACCE).** The COMAFFOR/JFACC may establish one or more JACCEs with other components to better integrate operations with the supported joint task force (JTF) headquarters (if the theater JFACC is designated in support to a JTF) and to better integrate air component operations within the overall joint force. When established, these elements act as the JFACC's primary representatives to the respective commanders and facilitate interaction among the respective staffs. The JACCE facilitates integration by exchanging current intelligence, operational data, and support requirements, and by coordinating the integration of JFACC requirements for airspace coordinating measures, joint fire support coordinating measures, CAS, air mobility, and space requirements. As such, the JACCE is a liaison element, not a C2 node; thus, the JACCE normally has no authority to direct or employ forces. The JACCE should not replace, replicate, or circumvent normal request mechanisms already in place in the component/JTF staffs, nor supplant normal planning performed by the AOC and AFFOR staff.

- **Tactical air control party (TACP).** The TACP is the principal Air Force liaison element aligned with Army maneuver units from division through battalion. The primary mission of TACPs is to advise their respective land commanders on the capabilities and limitations of airpower as well as assist the ground commander in planning, requesting, and coordinating CAS. At the battalion level, TACPs are normally organized to request and control aircraft. The TACP is the COMAFFOR/JFACC's primary representative to the tactical level land commander and provides terminal attack control. In the TACS chain of command, TACPs are under ASOC control. While they operate in the field co-located with the ground units they support, TACP personnel remain under the operational control (OPCON) of the COMAFFOR. The TACP consists of air liaison officers and joint terminal attack controllers.

- **Air liaison officer (ALO).** An ALO is aligned with a land maneuver unit and functions as the primary advisor to individual ground commanders on the capabilities and limitations of air power. Acting as a land commander's expert on air operations, ALOs must be involved in the supported land commander's military decision making process so they can perform detailed air support planning with their own staff. ALOs are assigned to all land maneuver units at the corps, division, and brigade levels. At battalion level, the senior member of the TACP is called a battalion air liaison officer (BALO). A BALO is a specially trained and experienced noncommissioned officer or officer.

- **Joint terminal attack controllers (JTACs).** The JTAC is the Army ground commander's qualified (certified) Service member, who, from a forward position, directs the action of combat aircraft engaged in CAS and other air operations in the ground commander's operational area. The JTAC provides the ground commander recommendations on the use of CAS and its integration with ground maneuver.

Other Service's Air-ground Control Systems

- **Army Air-Ground System (AAGS).** Closely related to, and interconnected with, the TACS is the AAGS. The AAGS provides for interface between Army and tactical air support agencies of other Services in the planning, evaluating, processing, and coordinating of air support requirements and operations. Using organic staff members and communications equipment, the AAGS works in conjunction with the TACS to coordinate and integrate both Army component aviation support and air component support with Army ground maneuver. Army airspace C2 elements are at the senior Army echelon and may extend down through all tactical command levels to the maneuver battalion.

- **Navy Tactical Air Control System (NTACS).** The NTACS is the principal air control system afloat. The NTACS is comprised of the Navy tactical air control center (TACC), tactical air direction center (TADC), and helicopter direction center. The Navy TACC is the primary air control agency within the AO from which all air operations supporting the amphibious task force are controlled.

- **Marine Air Command and Control System (MACCS).** The MACCS consists of various air C2 agencies designed to provide the Marine air-ground task force (MAGTF) aviation combat element (ACE) commander with the ability to monitor, supervise, and influence the application of Marine Corps air. Like the Air Force, Marine aviation's philosophy is one of centralized control and decentralized execution.[3] The Marine force's focal point for tasking and exercising operational control over Marine Corps air forces is the tactical air command center (TACC), which performs similar duties for organic Marine aviation that the AOC performs. The direct air support center (DASC) is roughly equivalent to the Air Force's ASOC, while at lower echelons of command the Marine system uses the same TACP label for air support liaisons as the TACS-AAGS.

During the conduct of an amphibious operation, elements of both Navy and Marine systems are used to different degrees from the beginning of the operation until the C2 of aircraft and missiles is phased ashore. Under the commander, amphibious task force, the Navy TACC, typically onboard the amphibious flagship is normally established as the agency responsible for controlling all air operations within the allocated airspace regardless of mission or origin, to include supporting arms. As the amphibious operation proceeds, C2 of aviation operations is phased ashore and command responsibilities for landing force air operations shift from the Navy to the Marines as MACCS agencies are established on the ground. For further discussion of air support to amphibious operations, see JP 3-09.3, *Close Air Support*.

- **Special Operations Air-Ground System (SOAGS).** Theater special operations are normally under the control of the JFSOCC. If designated by the JFSOCC, control of SOF airpower is normally exercised by a joint special operations air component commander (JSOACC). If a JSOACC has not been designated, then SOF airpower is controlled by its Service component within the joint force special operations command. Principal organizations and personnel that support coordination of CAS for SOF are the SOLE, the special operations C2 element, special tactics teams, and JTAC-qualified SOF personnel.

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[3] For a discussion of the Marine Corps approach to centralized control and decentralized execution see Marine Corps Doctrine Publication (MCDP) 6, *Command and Control*, Chapter 3.

ANNEX 3-03 COUNTERLAND OPERATIONS

COUNTERLAND OPERATIONS

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Airpower has attributes that allow it to be employed in diverse and multiple operational tasks across the joint operations area (JOA). However, there is rarely enough airpower available to satisfy all demands. Effective counterland operations call for centralized control and decentralized execution. The commander, Air Force forces optimizes the use of normally scarce airpower assets through centralized control. Centralized control also minimizes undue dissipation and fragmentation of effort and ensures coherence and focus on essential joint force commander objectives. Because no single commander can personally direct all the detailed actions of a typical complement of assigned and available air and space forces, decentralized execution of air missions is necessary and is accomplished by delegating appropriate authority for detailed mission planning and execution. Decentralized execution ensures effective employment of limited assets, allows tactical adaptation, and accommodates the Services' different employment concepts and procedures.

ANNEX 3-03 COUNTERLAND OPERATIONS

BASIC PLANNING CONSIDERATIONS

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Both air interdiction (AI) and close air support (CAS) operations require the full spectrum of support, from logistics to force protection to administrative services. Logistics and other combat support are key enablers to counterland operations. Key factors affecting logistics supportability include force beddown and base support planning, deployment and sustainment of munitions and fuel, and maintenance support for critical spares. A robust air mobility capability, especially for intratheater movement, is critical for getting this logistical support to the bases that require it. As an expeditionary force, these key

AIR REFUELING—A CRITICAL ENABLER

Air refueling is a key part of most air component operations and extends the range, payload, and endurance of counterland assets, whether US Air Force, other Service, or allied nation forces, thereby increasing their effectiveness. In some cases, counterland missions would not be possible at all without air refueling capability. Air refueling is a key enabler to initial force deployment as well, since most counterland aircraft lack the range to deploy directly to or from the combat theater on their own.

support issues assume even greater importance. This section highlights some of the support aspects that are particularly important to the counterland function.

Munitions Requirements

Maintaining proper stocks of precision-guided munitions is critical. There are usually tradeoffs involved in deciding which weapons to employ against specific targets, and availability often a factor. Proper knowledge of the munitions available at each air base, carrier battle group, etc., along with their weapons resupply capability, is vital. Those munitions with the greatest potential for accuracy, destructiveness, or standoff range are often in the shortest supply. Targeteers and weaponeers should keep in mind factors such as anticipated length of the operation, munitions needs of the various operation or campaign phases, and tradeoffs of each weapons type when making munitions recommendations.

Air Refueling

Tanker aircraft are a force multiplier that enhances, or in some cases enables, counterland operations by allowing access to a wider range of targets and payloads. On-station times will be increased for AI and CAS missions, providing decreased response times and increasing the counterland effects on the enemy. One of the key tasks for air tasking order (ATO) production teams is to optimize use of the available tankers; availability of refueling booms and drogues is often the limiting factor that determines how many counterland targets can be attacked in a given ATO execution period. Tanker availability is further complicated during coalition operations as certain combinations of tankers and receivers may not be permitted by national rules.

While technically a support asset, air refueling has become such an integrated part of counterland force packaging that it would be difficult to imagine operating without the enhanced capabilities it provides. For example, enemy antiship defenses may force an aircraft carrier to stand-off from the counterland area, requiring Air Force refueling support to get carrier aviation to the fight. In anti-access and area denial environments where air superiority is in dispute, and enemy aircraft and missiles threaten air bases close to the ground fighting, air refueling may be the only way to get counterland missions to the fight from protected bases further to the rear.

Target Development

During target development, the planned targeting process should relate specific targets to objectives, desired effects, and accompanying actions. Target development requires a systematic examination of potential target systems to understand where critical linkages and vulnerabilities exist. Target development involves four distinct functions: target analysis, target validation, target nomination, and collection and exploitation requirements. The product of this phase is the joint integrated prioritized target list (JIPTL). Annex 3-60, *Targeting,* provides information on air planning and the targeting process.

Some targets require special care/consideration during attack planning and execution. Examples include certain leadership targets due to potential political and/or diplomatic repercussions and targets containing chemical, biological, radiological and nuclear (CBRN) agents or materials where an attack could lead to the spread of CBRN contamination. See JP 3-60, *Joint Targeting*, for prioritization and special considerations related to planning and executing attacks on certain targets.

Once potential targets are identified, intelligence provides precise locations of individual target elements, status of defenses, and other information necessary for the detailed planning of counterland missions.
The suitability of a target set for attack is often decided by a combination of its criticality and vulnerability. For example, fewer conveyances and depots in an enemy transportation system increase the enemy's dependence on that system; therefore, each potential target in that transportation system becomes more critical. Conversely, an enemy possessing a varied, dispersed transportation system is less operationally vulnerable to infrastructure interdiction. Tactical vulnerability refers to the ease of attacking a particular target, based on hardening, defenses, etc., once it has been identified that the attack will produce the desired effects. Tactical vulnerability is important, as the benefit of attacking a target should be balanced against the expected cost. Timing is also important to a particular target's criticality to the enemy. For example, rotary-wing forces typically operate from forward arming and refueling points that are mobile and thus not exceedingly hardened. Catching an enemy helicopter force at such a location could yield high payoffs in terms of both forces and infrastructure destroyed. When marshalling for an attack, or deploying for transport to the forward area, ground combat units may be vulnerable for short periods. The enemy may risk this temporary vulnerability in order to get their forces into combat, but proper friendly intelligence can create opportunities for high payoff attacks by allowing planners to focus on the exact time of maximum enemy vulnerability.

Mobile targets normally require a different approach than fixed targets, whether attacking actual enemy combat forces or their fielded support. Sensors such as moving target indicators can often locate and compute accurate bombing solutions for any moving vehicle on a battlefield, and the heat generated by operating engines and equipment often makes mobile units easily located by either onboard sensors or precision-guided munitions. In some theaters, the air operations center (AOC) employs a dynamic targeting cell to ensure planning both maximizes the effectiveness of counterland attack on mobile targets and integrates the effort with the ground scheme of maneuver. Fixed targets may be harder to identify with onboard sensors and may be more hardened against weapons effects, but their fixed nature makes target location easier and simplifies targeting by weapons such as global positioning system (GPS)-aided bombs or missiles.

Environmental factors need consideration during target development. Target area environmental conditions include terrain features, adverse weather, time of day or night, humidity and temperature effects, solar activity, and active or passive defense

measures (such as smoke and camouflage). These may act to conceal targets, reduce visibility, and degrade weapon systems and overall counterland capabilities. Lunar illumination and weather conditions can drastically affect the ability of onboard sensors to both locate and identify targets. Terrain features may restrict target acquisition in some bandwidths, thus requiring specialized weapons, sensors, and tactics. The flexibility of different sensors and munitions that allow use of optical, near and far spectrum infrared, radar, and GPS for target acquisition, marking, and weapons guidance gives the counterland planner many options to counter the natural and artificial obstacles to success. However, the flexibility of these same sensors and weapons may be limited depending on environment conditions.

During the target development phase, planners should coordinate with other organizations and components to prevent fratricide, collateral damage, or a propaganda advantage for the enemy. Extensive coordination is required with the surface component and special operations liaison element (SOLE) to facilitate this phase. Examples of operations requiring this level of coordination are personnel recovery and information operations, to include public affairs.

The joint force special operations component commander (JFSOCC) deconflicts special operations through the JFC and with the other component commanders to avoid fratricide. AOC personnel should work through the battlefield coordination detachment (BCD) and the air support operation center (ASOC) to ensure that air component targeting is coordinated with and deconflicted from land component operations. Careful crafting and placement of fire support coordination measures (FSCMs) can facilitate.

Urban Considerations

Air Force doctrine applies to the range of military operations, as appropriate, from stability, security, transition, and reconstruction operations to major operations and campaigns. Doctrine outlined in JP 3-06, *Joint Urban Considerations,* describes the triad of terrain, population, and infrastructure to be considered before and during operations in that environment. Urban warfare is specific to an environment, and should not be substituted with related terms of irregular warfare or asymmetric warfare.

While urban environments vary greatly, challenges to counterland operations can be expected in identification of combatants, collateral damage, preservation of infrastructure, restrictive rules of engagement (ROE), line-of-sight issues (to include targeting as well as communications), and freedom of maneuver. Command and control (C2) of airpower does not change in the urban environment, but tactics, techniques, and procedures may be vastly different from those employed on the open battlefield.

Planners should consider that ground operations will be largely decentralized due to communication limitations, and coordination will be time-consuming to prevent fratricide and mitigate collateral damage. Large munitions may be traded for increased loiter time

in fuel, as smaller precise weapons with tailored effects may be more desirable for employment.

Collateral damage in cities or towns represents great risk that must be considered and minimized. One real, alleged, or staged collateral damage or fratricide event can have strategic impact, affecting ROE, special instructions (SPINS), host nation restrictions on operations, etc. Planners should integrate public affairs and military information support operations (MISO) into counterland operations from strategy development through mission execution. Public information planners should be involved early in the process to mitigate negative events and leverage successes during counterland operations. Next, planners should account for weather effects caused by the urban environment. Factors include increased pollution and aerosols affecting target detection, warmer temperatures affecting infrared signatures, and variable wind speeds affected by building layout. Finally, urban operations, by their very nature, involve significant law of armed conflict (LOAC) considerations. In particular, commanders and aircrew should determine whether the operation is a military necessity and whether the potential harm to noncombatants outweighs the importance of the operation.

Close air support (CAS) is difficult when supporting house-to-house ground fighting, where the task of locating and identifying friendly positions may prove highly demanding. Locating the enemy targets is also more difficult due to factors like obstructions from multistory structures that hamper both sensor and weapon line-of-sight. Techniques such as overlaying tactical charts and local street maps may prove useful in identifying enemy and friendly positions. CAS in an urban environment requires increased reliance on friendly ground forces to locate and mark targets since enemy combat units are often concealed inside buildings.

During urban engagements, such as the battle for Falujah in Iraq, ground commanders developed urban grid reference systems for aircrews to use to quickly identify targets in urban terrain. When operating in urban environments aircrews should give extra attention to the axis of attack and target designation; the problem may be similar to attacking enemy forces in steep mountainous terrain. Larger urban areas with more vertically developed buildings add increased elevation issues to the targeting problem, and the combination of tall buildings and narrow streets can cause an “urban canyon” effect leading to masking issues for line-of-sight munitions and targeting sensors. Munitions effects will vary greatly depending on whether the enemy can be attacked in the open versus inside buildings, requiring both patience and flexibility for mission success. When performing CAS in an urban environment, buildings may interfere with communications between air and ground, complicating the coordination process. Ground forces may also have difficulty marking targets for CAS aircraft in an urban environment, and careful consideration should be given to the type of terminal attack control (TAC) selected. The AC-130 gunship and strike aircraft with precision guided munitions, particularly small diameter munitions, have proven particularly effective in many urban operations with their combination of precision accuracy and wide range of

onboard sensors. The AC-130 and unmanned aircraft (UA)[1] have been useful in urban environments, where extended loiter times are often necessary to pinpoint target sets in close proximity to noncombatants.[2]

Weaponeering and Allocation

Weaponeering is defined as "the process of determining the quantity of a specific type of lethal or nonlethal means required to create a desired effect on a given target."[3] Weaponeering considers such things as the desired effects against the target (both direct weapons effects and indirect desired outcomes), target vulnerability, delivery accuracy, damage criteria, and weapon reliability. Targeting personnel quantify the expected results of lethal and nonlethal weapons employment against prioritized targets to produce desired effects.

Weapons effects are always a critical part of targeting for counterland. Some munitions and fuses are designed for very specific applications and are effective against certain targets with little or no capability against others. Good intelligence data on target information are vital to the proper matching of munition to target. Likewise, the flexibility of some munitions and fuses to provide multiple effects allows planners options for maximum effect against preplanned targets and in many cases allows inflight selection of weapons/fuse settings for dynamic targets. The latter capability is especially important for CAS and on-call air interdiction, when the specific target type may not be known prior to takeoff. When possible, combat aircraft should have a variety of munitions to meet operational requirements.

Allocation is the distribution of limited resources among competing requirements for employment. Allocation assigns specific airpower assets and targets against the apportionment priorities. After allocation, the master air attack plan is created that matches assets against AI and strategic targets. Following allocation, the distribution process matches CAS assets against support requests, which should be planned by the ASOC in conjunction with ground force planning. The final step of the process is the actual ATO production, which packages the attacking and supporting assets to achieve optimum effect against the enemy.

AI targets nominated by the surface component are not often presented in the standardized basic encyclopedia number designation which is another reason to retain flexibility in counterland planning. If the surface component needs a particular enemy unit attacked, and that unit meets the requisite priority criteria, planners should ensure that particular enemy unit is affected as required. This requires the AOC planners to maintain awareness of that enemy unit's position; the BCD can help with this task. Instead of concern over a particular enemy unit, the surface component may have a certain geographic area of concern to its scheme of maneuver. In this case, the friendly

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[1] The USAF refers to some of its larger UAs as remotely piloted aircraft (RPA) to differentiate its operators who have been trained to similar standards as manned aircraft pilots.
[2] See ALSA publication ATP 3-06.1, *Aviation Urban Operations*.
[3] JP 3-60, *Joint Targeting*.

ground force requires an attack on any enemy forces that happen to be there. Planning methods should therefore allow for either an area or unit-specific focus for AI targeting, especially for ground-nominated targets. Attacks against large ground forces are most effective when prioritized targeting guidance is included in the nomination, such as artillery first, armor second, etc. When possible, however, air support can be most effective when the surface component specifies mission-type orders or desired effects against an enemy unit, such as “delay enemy X Brigade 72 hours from achieving contact” or “fix enemy Y Division in place for 48 hours.” The air-ground system works best when the surface component requests overall operational area effects, rather than specific targets, due to the greater ability of the air component to analyze the enemy force for proper airpower targeting.

Before the actual ATO is put into production, justified changes to targets and targeting priority can be incorporated. Once the ATO is put into final production, approved changes are typically passed on to the combat operations division for incorporation either at tactical unit level planning or during actual mission execution. If the enemy ground force does move to an unexpected location, it is not likely to have moved far enough to require much repackaging of counterland missions. This allows for a relatively simple retargeting of a given flight or strike package to the new target location. Any changes should account for differing air defenses, proximity to friendly ground forces, and other factors before final approval.

For those missions where lucrative targets are highly likely, but preplanned locations are not available, airborne or ground alert may be appropriate. This is the most common method employed for CAS where there is typically not a pre-identified target prior to mission execution. Airborne alert AI can be used to provide up-to-the-minute flexibility, where final targeting guidance comes from offboard sources such as Joint Surveillance Target Attack Radar System (JSTARS) or unmanned aircraft. Airborne alert missions should only be planned when lucrative targets are likely to exist, otherwise the missions will be wasted. The “push” system of providing preplanned backup targets for both CAS and AI alleviates this problem to some extent; this procedure gives each mission a fixed target of some military value in case the primary target fails to materialize.

ANNEX 3-03 COUNTERLAND OPERATIONS

EXECUTION PLANNING AND FORCE EXECUITON

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Execution planning includes the preparation necessary for combat units to accomplish the decentralized execution of the air tasking order (ATO). It generally consists of the 12 hours immediately prior to the start of a given day's ATO execution period. Force execution refers to the 24-hour period in which a particular ATO is executed by combat units. The air operations center (AOC) assists in preparing input for, supporting, and monitoring execution.

During execution, the AOC is the central agency for revising the tasking of airpower forces. It is also responsible for coordinating and deconflicting any changes with appropriate agencies or components. Due to operating environment dynamics, the commander, Air Force forces (COMAFFOR) may be required to make changes to planned operations during execution. The AOC should be flexible and responsive to changes required during execution of the ATO. Forces not apportioned for joint or combined operations, but included on the ATO for coordination purposes, can be redirected only with the approval of the respective component or allied commander. During execution the COMAFFOR employs centralized control to reallocate air assets in response to dynamic targets or changing priorities.

Dynamic targeting includes the prosecution of targets that emerge during ATO execution that commanders deem worthy of prosecution. The dynamic targeting process is not separate from the air tasking cycle or planned targeting process and is time-sensitive to some degree. The combat operations division (COD) has overall responsibility for implementation of the dynamic targeting process.[1] Successful dynamic targeting, however, requires a great deal of prior planning and coordination with other divisions within the AOC and with other components. If dynamic targeting is to be done correctly, planners decide upon concepts of operation that make assets available to the COD prior to the start of execution. This can be done in a number of ways:

- Preplanned target reference methods and fire support coordination measures such as kill boxes.

[1] See Air Force Instruction 13-1 AOC, Volume 3 for an expanded discussion on AOC divisions and teams.

- Pre-positioned or on-call intelligence, surveillance, and reconnaissance and strike packages for rapid response to emerging targets.

- Using joint intelligence preparation of the operational environment to determine the most probable areas where targets will emerge during execution.

- Coordination and synchronization of dynamic targeting operations by streamlining and developing procedures for rapid handover of the mission tasking to another component for mission execution if the air component cannot attack a target that emerges.

Liaison officers (LNOs) from other components or Services may be very helpful during the dynamic targeting process. LNOs—particularly the special operations liaison element—may be able to provide the COMAFFOR with additional options for dealing with emerging targets and may be able to provide locations and activities of special operations forces and other friendly forces to assist with the find, fix, track, target, engage and assess (F2T2EA) of counterland targets, or to at least assist in deconfliction.

BATTLESPACE GEOMETRY COORDINATION

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Since counterland operations are normally conducted in conjunction with friendly land forces, fire support coordination measures (FSCMs) should be established to integrate joint fires and avoid fratricide. FSCMs are established for adjacent lanes of maneuver and are linear in nature. Traditional combat operations may also involve rapidly advancing ground maneuver or widely distributed ground operations; either of these approaches will require non-linear FSCMs. Moreover, when conducting stability operations, the linear operational area tends to dissolve into pockets of dispersed operations and noncontiguous areas of operations (AOs). Close air support (CAS) and air interdiction (AI) require FSCMs that are flexible, simple, effective, and relevant to conflicts characterized by linear and nonlinear operations.

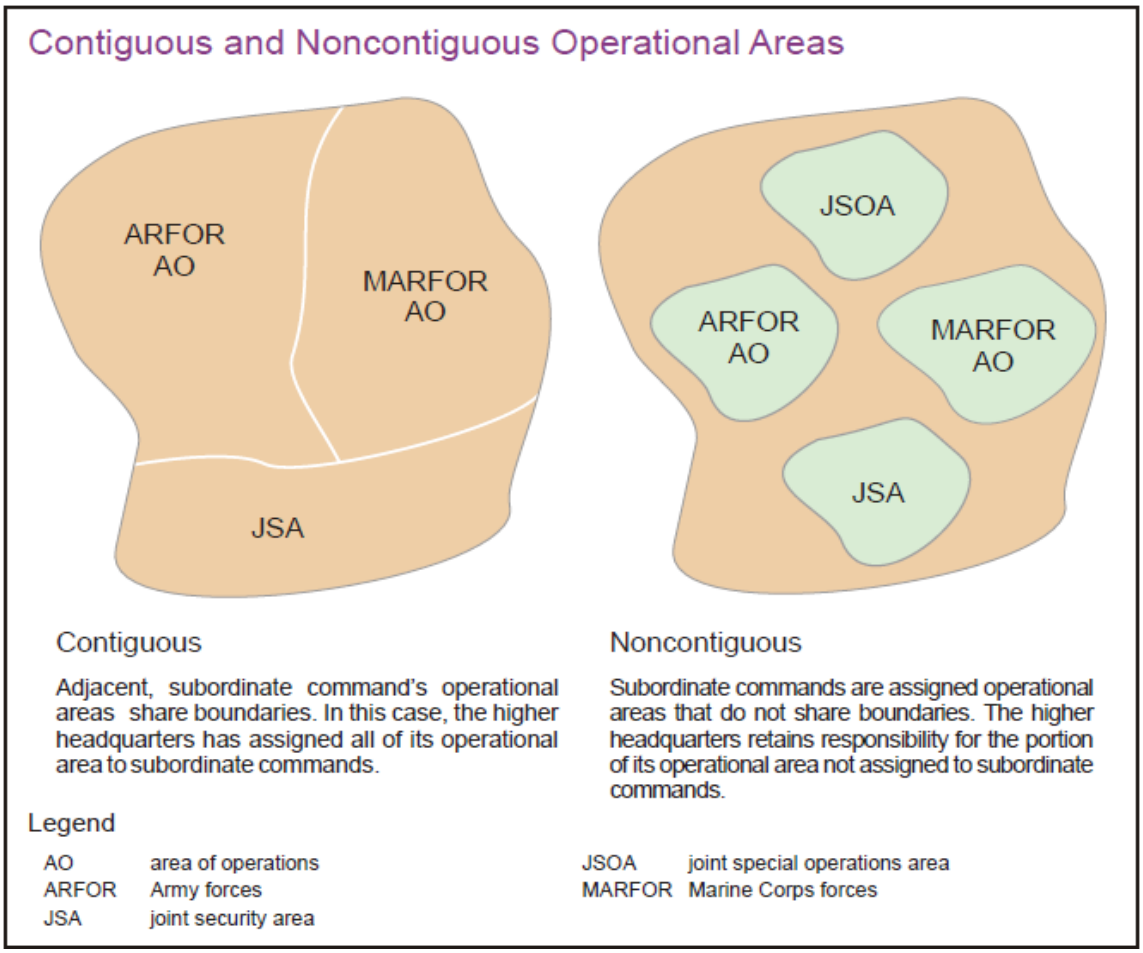
Contiguous and Noncontiguous Operational Areas

Operational areas may be contiguous or noncontiguous. When they are contiguous, a boundary separates them. When operational areas are noncontiguous, they do not share a boundary; the concept of operations links the elements of the force. A noncontiguous operational area normally is characterized by a 360-degree boundary. The higher headquarters is responsible for the area between noncontiguous operational areas. See figure, “Contiguous versus Noncontiguous Operations” below.

Linear and Nonlinear Operations

In linear operations, commanders direct and sustain combat power toward enemy forces in concert with adjacent units. Linearity refers primarily to the conduct of operations along lines of operations with identified forward lines of own troops. In linear operations, emphasis is placed on maintaining the position of the land force in relation to other friendly forces. This positioning usually results in contiguous operations where surface forces share boundaries. Linear operations are normally conducted against a deeply arrayed, echeloned enemy force or when the threat to lines of communications reduces friendly force freedom of action. In these circumstances, linear operations allow commanders to concentrate and integrate combat power more easily.

In nonlinear operations, forces orient on objectives without geographic reference to adjacent forces. Nonlinear operations typically focus on multiple decisive points and are



Contiguous versus Noncontiguous Operations (Source: JP 3-0)

characterized by noncontiguous operations. Nonlinear operations emphasize simultaneous operations along multiple lines of operations from selected bases. Nonlinear operations place a premium on intelligence, air mobility, and sustainment. Often integrated with ground maneuver, swift aerial attack delivering concentrated, precise fire against several decisive points can induce paralysis and shock among enemy troops and commanders. Operations JUST CAUSE, ENDURING FREEDOM, ODYSSEY DAWN, and UNIFIED PROTECTOR are examples of nonlinear operations. The joint forces orient more on their assigned objectives (for example, destroying an enemy force or seizing and controlling critical terrain or population centers) and less on their geographic relationship to other friendly forces. To protect themselves and achieve objectives, ground forces rely heavily on airpower to provide operational area awareness, mobility advantages, and freedom of action. Depending on the situation, the joint force commander may conduct linear or nonlinear offensive and defensive operations in contiguous and noncontiguous areas. Linear contiguous warfare typically characterizes major operations and campaigns while stability operations are usually nonlinear and noncontiguous.

LINEAR COORDINATION MEASURES

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Various boundaries and coordination measures are used for airspace control and fire support coordination when planning and executing counterland operations. The measures help to integrate air and ground maneuver, ensure deconfliction, avoid fratricide, and identify which parts of the operational area require specialized control procedures. The joint force commander (JFC) may define lateral, rear, and forward boundaries to define areas of operation (AOs) for the various surface components.

The following discussions center on linear boundaries and coordination measures that play a significant role in counterland operations.

Forward Boundary (FB)

The forward boundary defines a component's outer AO and is the farthest limit of an organization's responsibility. The organization is responsible for deep operations to that limit. Within the joint operations area (JOA), the next higher headquarters is responsible for coordinating deep operations beyond the FB. In offensive operations, the forward boundary may move from phase line to phase line, depending on the battlefield situation.

Forward Line of Own Troops (FLOT)

The FLOT is a line that indicates the most forward positions of friendly forces during linear operations at a specific time. The FLOT normally identifies the forward location of covering and screening forces. The zone between the FLOT and the fire support coordination line (FSCL) is typically the area over which friendly ground forces intend to maneuver in the near future and may also be the area within which ground force organic fires are employed. This zone is the area where air operations are normally executed through the air support operations center (ASOC).

Fire Support Coordination Measures

Fire support coordination measures (FSCMs) are necessary to facilitate the rapid engagement of targets and simultaneously provide safeguards for friendly forces. FSCMs are divided into two categories: permissive and restrictive. Permissive FSCMs

facilitate attacks and include coordinated fire lines (CFLs), free fire areas (FFA), and FSCL. Restrictive measures safeguard friendly forces and include no-fire areas (NFA), restrictive fire areas (RFA), restrictive fire lines (RFL), and airspace coordination areas (ACA). When supporting the land component commander, airpower operates within the confines of all joint force land component commander (JFLCC) FSCMs. In order to reduce the risk of fratricide and still take advantage of airpower's inherent flexibility and versatility, FSCMs should be clearly defined, easily controlled, and not overly restrictive. For detailed information on FSCMs, see JP 3-09.3, *Close Air Support*.

Historically, linear operations have used linear FSCMs such as the FSCL. However, as operations move towards being nonlinear, dispersed component AOs necessitate the need for nonlinear FSCMs such as kill boxes. Advancements in data link technology and digital information have increased the potential for combat forces to effectively coordinate and conduct nonlinear operations. Nonlinear operations require Airmen to continually evaluate the capabilities of the controlling ASOC to ensure adequate resources (manning, radios, frequencies, computer support, etc.) are available to meet the command and control (C2) needs of aircraft operating in ever-increasing dispersed AOs in the JOA. During kill box operations, the air operations center (AOC) maintains C2 of aircraft outside of the AO while the ASOC typically maintains responsibility for aircraft inside the AO. The following section describes the most significant FSCM that pertains to major counterland operations—the FSCL.

Fire support coordination line. The FSCL is a permissive FSCM established and adjusted by appropriate land or amphibious force commanders within their boundaries in consultation with superior, subordinate, supporting, and affected commanders. FSCLs facilitate the expeditious attack of surface targets of opportunity beyond the coordinating measure. The FSCL does not divide an AO by defining a boundary between close and deep operations or a zone for CAS. However, the air component will use the FSCL to divide sectors of control between the ASOC and Airborne Warning and Control System (AWACS)/control and reporting center (CRC) with the ASOC's sector of control being beneath the coordinating altitude, from rear boundary or FLOT to the FSCL and AWACS/CRC controlling forward of the FSCL. The FSCL applies to all fires of air, land, and sea-based weapons systems using any type of ammunition. Forces attacking targets beyond a FSCL must inform all affected commanders in sufficient time to allow necessary reaction to avoid fratricide. Supporting elements attacking targets beyond the FSCL should ensure the attack will not produce adverse attacks on, or to the rear of, the line. Short of an FSCL, the appropriate land or amphibious force commander controls all air-to-ground and surface-to-surface attack operations. The FSCL should follow well-defined terrain features or use a common reference system. Coordination of attacks beyond the FSCL is especially critical to commanders of air, land, and special operations forces. In exceptional circumstances, the inability to conduct this coordination will not preclude the attack of targets beyond the FSCL. However, failure to do so may increase the risk of fratricide and could waste limited resources. The purpose, establishing authority, employment, and placement of the FSCL should be understood to effectively execute counterland operations within a surface AO.

The purpose of the FSCL is to ensure the coordination of fires not under the surface commander's control but which may affect his current tactical situation. The land component commander typically sets the FSCL after coordinating with all affected component commanders. All attacks short of the FSCL are coordinated with the establishing component, primarily to ensure proper integration and prevent fratricide.

OPERATION IRAQI FREEDOM (OIF) FIRE SUPPORT COORDINATION MEASURES (FSCMs)

OIF employed traditional FSCMs. Because of the Army's extensive process required for changing linear FSCMs, moving the FSCL proved to be a time-consuming process. Therefore, the initial FSCL was placed well beyond the range of land fires in order to accommodate the anticipated rapid movement of land forces into Iraq.

The deep placement of the FSCL hampered the efficiency of airpower. Ground forces, and their associated TACPs, were incapable of detailed integration beyond the range of their organic fires because no one was able to observe adversary targets. Aircrews were still required to comply with coordination procedures short of the FSCL. The time-consuming clearance process hindered the expeditious attack of fleeting targets beyond the range of the organic artillery. As a result, the area between the maximum range of land fires and the established FSCL created a sanctuary for enemy forces.

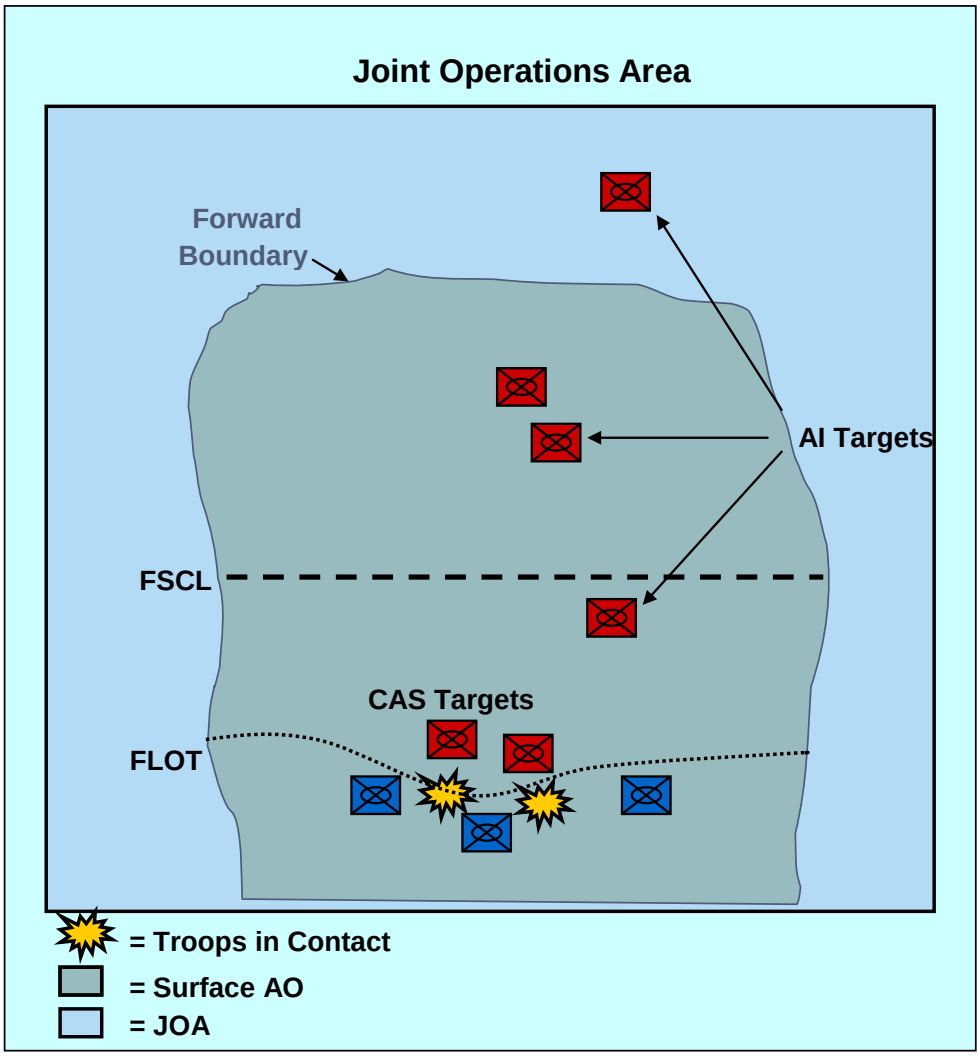
The FSCL should be near the maximum operating range of organic tube artillery since beyond that point air and space power provides the preponderance of effects.

Because of this, the FSCL is often used as the forward limit of the airspace controlled by the ASOC. This mandates the various ASOCs and other theater air control system (TACS) components that have the required connectivity to monitor not only air activity out to the FSCL but also be able to monitor friendly and enemy ground positions, surface-to-air threats, and all other key aspects of situational awareness. Likewise, when the ground component attacks targets beyond the FSCL, it is required to coordinate with the air component to ensure deconfliction and prevent multiple assets attacking the same target.

The optimum placement of the FSCL varies with specific circumstances, but typically it should be placed where the preponderance of effects on the battlefield shifts from the ground component to the air component. In this way, the FSCL placement maximizes the overall effectiveness of the joint force, and each component suffers only a small reduction in efficiency. To place the FSCL so deep or shallow that

one component is given complete freedom to operate usually results in the other components being so restricted that overall joint effectiveness suffers. The proper location for the FSCL may also shift from one phase of the operation to the next, depending on the scale and scope of each component's contribution during that phase. FSCL placement should take into account the ground scheme of maneuver and should be based on anticipated, not current, ground force positions at the time the FSCL will be active. History has shown that placing the FSCL too deep is detrimental to overall joint force effectiveness and may even provide the enemy a sanctuary from effective air attack.

The preponderance of lethal effects shifts from landpower to airpower near the maximum range of organic field artillery. Therefore, under all but the most rapid ground maneuvers, the FSCL is normally placed near the maximum range of tube artillery because airpower provides the most expeditious attack of surface targets beyond that point. To facilitate a rapidly moving battlefield, components may establish "on-call FSCLs" in advance that can be activated as the ground force moves. In the past, establishing the FSCL along an easily identifiable terrain feature has been critical to success. Modern digitization, along with advanced navigation equipment such as GPS, has reduced the importance of this factor. When possible, however, using obvious terrain features for FSCLs can still prevent errors from happening in the heat and confusion of battle.



Notional JOA with Surface AO and FLOT/CL/FB Relationship

Although normally thought of as a JFLCC responsibility, FSCL placement should be part of the joint targeting coordination board (JTCB) process. This ensures all components are able to integrate and maximize effects in support of JFC objectives. Joint doctrine does not define a depth or range for placing the FSCL in relation to the FLOT or forward edge of the battle area (FEBA). This permits the theater commander to tailor FSCL placement according to specific battle conditions that optimize joint operations. Theater commanders may employ the FSCL to achieve different desired effects.

The FSCL is primarily used to establish C2 procedures for planning and execution purposes—it does not define mission types. Missions flown beyond the FSCL typically do not use the ASOC, as they are beyond the distance where detailed integration is required. However, CAS missions can be flown in the portions of the operational area beyond the FSCL when friendly troops are operating there and require support. Ground forces such as SOF teams that often operate deep should include the appropriate TACS element for CAS control and have a liaison element at the AOC. Short of the FSCL, all missions typically require check-in with the ASOC while en route

to the target for an update on potential targets, surface-to-air threats, and friendly troop locations. CAS missions are normally handed off to a joint terminal attack controller (JTAC) or forward air controller–airborne [FAC(A)] for TAC. Even those short-of-the-FSCL missions that usually do not directly support the ground component, such as counterair or strategic attack, normally contact the ASOC/airborne C2 for situation updates and deconfliction while in the ASOC's airspace.

When the land component attacks targets beyond the FSCL, it is required to coordinate with the AOC to ensure deconfliction and to prevent multiple assets from attacking the same target. Land forces that often operate deep such as special operations teams should include the appropriate TACS element for terminal attack control and have contact with the special operations liaison element (SOLE) at the AOC.

> The Marines put in place a supplementary battlefield coordination line (BCL) to speed "expeditious attack of surface targets of opportunity" between the BCL and the more distant FSCL as Marine doctrine defined it. A typical BCL extended 18.6 [kilometers] out from the FLOT—roughly the range of [155] mm artillery. Air strikes short of this line were typically Type I, II, or III CAS calling for varying degrees of control. Beyond the battlefield coordination line, the "kill boxes" could be opened more easily, and the DASC was able to put its brisk procedures into play…. All levels monitored the air requests and intervened only to stop them. The DASC was co-located with [the fire support coordination center], who updated the ground picture as the DASC personnel worked the air picture…. The Marines used procedural control with aircraft checking in at control points to give route headings which the DASC controller cross-referenced…. Aircrews quickly caught on to the fact that the DASC could give them targets fast…. Soon the flow of coalition strike sorties, planned and unplanned, far exceeded anything the Marine air planners thought the JAOC would give them.
>
> **—Dr. Rebecca Grant,**
> **"Marine Air in the Mainstream," *Air Force Magazine,* June 2004**

Battlefield Coordination Line (BCL)

The Marine Corps has used an additional FSCM for a Marine-controlled AO, called a battlefield coordination line (BCL), roughly equivalent to the FSCL for an Army-controlled AO. The BCL is a supplementary FSCM that facilitates the expeditious attack of surface targets of opportunity. Unlike the FSCL, the BCL is used to help delineate CAS and AI procedures, and may be highly effective when used in conjunction with kill boxes. Because the BCL is set at the maximum range of organic tube artillery, any sorties flown short of the BCL are typically designated as CAS. This allows counterland

airpower to attack surface targets beyond the BCL using minimal coordination procedures with ground forces.

NON-LINEAR COORDINATION MEASURES

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In conflicts characterized by nonlinear operations, ground forces occupy pockets that may have large distances of open terrain between them (often occupied by the enemy). Under such circumstances, the classic linear concepts may need adjustment. However, one classic linear concept, the common reference system, is very useful in both linear and non-linear conflicts. The following discussion centers on using a common reference system and kill boxes.

Area Reference System (ARS)

An ARS is primarily an operational-level administrative measure used to coordinate geographical areas rapidly for operational area deconfliction and synchronization. An ARS should simplify communications and procedures between the components. If not dictated by a higher command, commanders may use any ARS they deem appropriate. However, if an ARS is developed without a lead organization or unified effort, separate grid systems may be developed or used that are not only incompatible but may negatively impact counterland operations.

The Global Area Reference System (GARS) is the ARS developed and approved by the director of the National Geospatial-Intelligence Agency, military Services, Chairman of the Joint Chiefs of Staff, and the Secretary of Defense. It is now the standardized operational area reference system that impacts not only Service doctrine and joint doctrine, but also the entire spectrum of operational area deconfliction.

The GARS uses a grid system with a simple, universal identifier recognizable by each component and their associated command and control and attack assets. A graphical depiction of the proposed reference system is in the following figure, “GARS Layout and Naming Convention.” Latitude and longitude coordinate references easily define cells since they are common and exist on most military operational graphs and charts. They should also allow for easy interpretation using digital displays common in the tactical weapon systems of all components. GARS is highly useful in facilitating rapid attacks on time sensitive targets and for expediting deconfliction of friendly force locations although it is not designed to support precise targeting. Rather than transmitting a series of latitudes and longitudes, an area can be defined by a brief yet succinct number/letter character string.

GARS is also useful because it enables establishment of appropriate control and coordination measures that can be mutually coordinated, deconflicted, and synchronized via a simple, common, mutually understood, and agreed upon reference system. A detailed discussion of GARS is located in JP 2-03, *Geospatial Intelligence Support to Joint Operations*. Additional discussion of reference system attributes in general can be found in JP 3-60, *Joint Targeting*, Appendix D, "The Target Assessment Process."

Kill box. A kill box is a three-dimensional permissive fire support coordination measure (FSCM) with an associated airspace coordinating measure (ACM) used to facilitate the integration of joint fires and the coordination of the airspace within. Kill boxes are established to support air interdiction efforts as part of the joint force commander's (JFC's) joint targeting process. Kill boxes allow lethal attack against surface targets without further coordination with the establishing commander and without the requirement for terminal attack control. When used to integrate air-to-surface and subsurface/surface-to-surface indirect fires, the kill box will have appropriate restrictions. These restrictions provide a three-dimensional block of airspace in which friendly aircraft are reasonably safe from friendly surface fires and restrict non-participating aircraft and maneuver forces from entering the kill box. The goal is to reduce the coordination required to fulfill support requirements with maximum flexibility while preventing fratricide. For an in-depth discussion, see AFTTP 3-2.59, *Kill Box*.

A kill box is established and adjusted by supported component commanders in consultation with superior, subordinate, supporting, and affected commanders, and is an extension of an existing support relationship established by the JFC. Kill box boundaries are defined using an area reference system (e.g., GARS). Changes to a kill box require notification of all affected forces within the joint operations area (JOA) and must allow sufficient time for these forces and/or components to incorporate the kill box change.

Tactical fire support control procedures within a theater of operations may use colors and specific terminology to describe the status of kill boxes within a JOA.

- **Blue kill box.** A blue kill box permits air-to-surface fires effects in the kill box without further coordination with the establishing headquarters.

- **Purple kill box.** A purple kill box permits the integration of surface-to-surface fires with air-to-surface fires into the purple kill box without further coordination.

- **Established.** The kill box is planned, approved with an effective time, and disseminated via the airspace control order (ACO).

- **Hot.** Term used to describe a kill box or a portion of a kill box where fires or effects of fires are allowed without further coordination or deconfliction.

- **Cold.** Term used to describe a kill box or portion(s) of a kill box where fires or effects of fires are not allowed without further coordination. A cold kill box does not restrict the airspace associated with the kill box.

- **Open.** A kill box with aircraft cleared to enter or with aircraft operating inside the kill box (to include unmanned aircraft systems [UAS]).

- **Closed.** A kill box or portion of a kill box restricting manned aircraft from operating within the confines of the kill box.

- **Cancelled.** The kill box is no longer established.

Although use of kill boxes is not mandatory, the kill box system reduces the coordination required to fulfill support requirements with maximum flexibility. Kill boxes support the commander's objectives and concept of operations, including designated target priority, effects, and timing of fires. Command and control (C2) updates on kill boxes will be accomplished (e.g., altitude restrictions, frequency use, established control measures within the kill box) via appropriate C2 systems. With appropriate restrictions, surface-to-surface fires may occur simultaneously with air-to-surface strikes. Kill boxes can augment use of traditional FSCMs, such as fire support coordination line FSCL, coordinated fire lines (CFLs), and battlefield coordination line (BCL). They can help the commander focus the effort of air assets. When traditional FSCMs are not useful or are less applicable, the kill box can be the primary method for identifying areas to focus air assets. Planners should consider the following factors when creating kill box procedures within the JOA.

A kill box is an FSCM (with an associated ACM), and is not a reference system. Kill box boundaries are defined using an area reference system, which provides the construct (a two-dimensional system), and a kill box is the application. The addition of altitude restrictions makes a kill box a three-dimensional paradigm.

All aircrews executing missions within the confines of a kill box will execute their air tasking order (ATO) assigned mission in accordance with the law of armed conflict and applicable rules of engagement, collateral damage guidance and restrictions, positive identification (PID), and the special instructions (SPINS).

The decision to use a kill box requires careful consideration by the establishing authority. If used, its size, location, and timing is based on estimates of the situation and concept of operations. The commander must consider disposition of enemy forces, friendly forces, anticipated rates of movement, concept and tempo of the operation, surface-to-surface weapon capabilities, and other factors.

Integration of air-to-surface and surface-to-surface fires requires application of appropriate restrictions: altitude, time separation, or lateral separation. The supported commander will determine which of these is appropriate for the mission and ensure dissemination through the appropriate C2 nodes.

Kill Box C2. The air operations center (AOC) is the commander, Air Force force's (COMAFFOR's) primary element for planning, coordinating, and employing air component controlled kill boxes consistent with the JFC's intent. Other components must coordinate with the AOC prior to entering or engaging targets in a COMAFFOR kill box. This is normally done through the various liaison elements attached to the AOC, i.e., the BCD, the Naval Amphibious Liaison Element (NALE), the Marine Liaison Element (MARLE), and the SOLE. Through the ATO, the AOC tasks airpower to enter and engage targets in COMAFFOR kill boxes without further coordination with other components.

Command and control of airpower in these situations is conducted through the theatre air control system (TACS) as previously discussed. The air support operations center (ASOC) is responsible for all air operations short of the fire support coordination line (FSCL), including close air support (CAS) and air interdiction (AI). The AOC maintains responsibility for airpower operations beyond the FSCL.

Combined Kill Box and Traditional FSCM Operations. A combination of kill box and traditional FSCMs is possible, such as when a single large advance is made from a classic linear battlefield (such as operations during Operation IRAQI FREEDOM). Here the standard FSCL could be used for the slower moving ground forces, and ground component kill boxes could be created in front of, or behind, a rapid advance. This allows for more efficient air attack on non-engaged enemy land forces, the greatest freedom of land and aerial maneuver, and enhanced combat effectiveness—especially during non-linear operations.

A kill box is an FSCM that may contain other measures within its boundaries (e.g., no-fires areas [NFAs], restricted operating zones [ROZ], and airspace coordination areas [ACAs]). Restrictive coordinating measures will always have priority when established in a kill box.

The joint force special operations component commander (JFSOCC) may task special tactics teams to support the COMAFFOR in kill boxes. These taskings may include finding and fixing targets as well as providing laser designation support. Although these scenarios do not constitute CAS, they do require additional coordination. These situations require establishment of a restrictive FSCM in the kill box to protect the team, changing the affected quadrants/keypads to cold status, or canceling the kill box and execute CAS.