AIR FORCE DOCTRINE PUBLICATION 3-03

COUNTERLAND OPERATIONS

U.S. AIR FORCE

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Air Force Doctrine Publication 3-03, *Counterland Operations*

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FOREWORD

Doctrine embodies the fundamental principles by which military forces guide their actions in support of national objectives. It is a body of carefully developed, authoritative but not directive ideas that have been officially approved and establish a common frame of reference for solving military problems. However, to be an effective guide, the challenge for doctrine is to be simultaneously informed by the past, applicable in the present, and focused on the future.

The United States Air Force (USAF) must prepare for a new reality in which decision advantage, freedom of maneuver, and freedom of action are increasingly challenged. To deter, compete, and win across the continuum of competition, Airmen must advance solutions that allow them to conduct operations in highly contested environments. Broadly, the joint force's approach to meeting this challenge is encapsulated in joint all-domain operations (JADO). Together with joint all-domain command and control, JADO provides the joint force commander the means to integrate, synchronize, and deconflict the convergence of effects across all domains to achieve an operational advantage.

Air Force Doctrine Publication (AFDP) 1, *The Air Force*, supports this effort by establishing mission command as the Airman's philosophy for the command and control of airpower. Despite our advances, adversaries will likely retain the ability to deny or degrade our communications. Therefore, decision-makers at all echelons should have the ability to develop understanding, make decisions, and converge effects when disconnected from higher echelons. Mission command embraces centralized command, distributed control, and decentralized execution as the foundation for the responsiveness, flexibility, and initiative necessary at the tactical edge, and ensures capabilities continue to function, even when information is degraded or denied.

AFDP 3-03, *Counterland*, though firmly rooted in the past, looks to the future, adapting as needed to ensure continued utility and efficacy for the challenges to come. Properly planned and executed counterland operations are a crucial element to enable the achievement of joint force commander (JFC) objectives across the continuum of competition, including conflict. What worked in the past may work in the future, but not in the same way. Airmen must be trained to plan operations in a distributed or decentralized manner and execute the mission when isolated from higher echelons in denied environments. Airmen at all levels must be comfortable making decisions and operating based on the commander's intent and the principles of mission command. Effective counterland operations are informed by past lessons but find novel ways to apply those lessons in current and future environments.

CHAPTER 1: INTRODUCTION TO COUNTERLAND OPERATIONS

Counterland operations are airpower operations against enemy land force capabilities to create effects that achieve joint force commander (JFC) objectives. The air component commander executes counterland operations by conducting air interdiction (AI) across the theater (including inside land and maritime areas of operations), and by supporting ground forces (including special operations forces [SOF]) with close air support (CAS). To maximize the effect on the enemy, AI and CAS are typically integrated and coordinated with the land component commander's target nomination list and ground scheme of maneuver. Although usually associated with support to friendly ground forces, counterland operations may also be conducted independently of friendly ground force objectives or in areas where friendly ground forces are absent. Throughout history, airpower has played a crucial role in defeating enemy ground forces, including the allied breakout from Normandy in World War II, the defeat of the Iraqi army in 1991, and the destruction of the Iraqi army in 2003.

Counterland operations create effects at all levels of warfare and significantly influence the course of joint all-domain operations. Counterland effects focus on the tactical and operational levels of war by targeting fielded enemy ground forces and supporting infrastructure. Counterland operations contribute to strategic effects by denying the enemy's ability to execute coherent ground operations. In cases where the enemy places strategic value on a specific portion of its ground combat force, counterland operations can produce more immediate effects at the strategic level.

Counterland operations seek to destroy an enemy's fighting ability through focused attacks against key enemy ground targets. Acting on decisive points by striking enemy fielded ground forces, command and control (C2) nodes, vital logistics, or supporting infrastructure degrades the enemy system and contributes to an enemy incapable of effective resistance. Persistently applied, airpower can disrupt the enemy and destroy its ability to fight as an effective whole, allowing the JFC to gain the initiative and dictate an operational tempo.

Counterland operations vary based on the character of the conflict in which they are employed. Counterland operations apply to large-scale combat operations (LSCO) as well as to stabilization activities characterized by insurgency, guerrilla tactics, and civil strife.[1] It is crucial to understand the character of the conflict to properly apply airpower during counterland operations.[2]

Counterland operations can be the main attack and decisive means for achieving JFC objectives. Counterland operations may be employed to support the JFC's theater strategy directly, as was the case for air operations over Libya in 2011.

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

[2] For more information on air support of maritime operations, see Air Force Doctrine Publication (AFDP) 3-04, *Countersea Operations*.

Counterland Operations Achieved JFC Objectives

In the spring of 2011, the United States and coalition partners waged an aerial intervention campaign, termed Operation ODESSEY DAWN, to enforce United Nations Security Council Resolution (UNSCR) 1973 which authorized enforcement of a no-fly zone and necessary military actions to protect Libyan civilians from attack.

Joint Task Force (JTF) Odessey Dawn, commanded by Admiral Samuel Locklear III, designed a campaign plan to gain air superiority needed to enforce a no-fly zone and enable follow-on interdiction of Muammar Qaddafi's fielded forces-an assortment of armor, artillery, and armed technical vehicles-that were harming Libyan civilians.

JTF Odessey Dawn's air component conducted air interdiction against preplanned and targets of opportunity using B-1, F-16, F-15E, A-10, AC-130, AV-8B, and MQ-1 aircraft as well as a wide variety of coalition fighter aircraft. The combination of ISR platforms, fighter aircraft targeting pods, and precision-guided munitions was effective at finding, fixing, and destroying Qaddafi regime forces.

The efforts of Operation ODESSEY DAWN were continued by the NATO-led Operation UNIFIED PROTECTOR (OUP). Notably, OUP saw MQ-1s employed extensively in a Strike Coordination and Reconnaissance (SCAR) role, either conducting or directing roughly 60% of airstrikes during the conflict. With longer loiter time, SCAR aircrew were able to identify targets and hand them off to fighters, while ensuring strike deconfliction and reducing collateral damage risk. Though not a campaign objective, as a result of continued air interdiction operations, Libyan National Transition Council (NTC) forces were able to gain control of Libyan territory and eventually overthrow the Qaddafi regime, effectively ending the threat to Libyan civilians. Ultimately, air component counterland operations were able to achieve the JFC's objectives with no loss of coalition personnel and minimal collateral damage.

-- Derived from *Precision and Purpose: Airpower in the Libyan Civil War*, RAND Corporation, 2015

COUNTERLAND AND UNITY OF EFFORT

Counterland operations are planned and conducted by a joint force. Counterland operations levy requirements on the air component to plan, execute, and assess in coordination with land components to ensure unity of effort. Commanders collaborate to identify crucial targets, decide when, where, and how to attack them, and determine how ground operations and counterland efforts best complement each other to achieve JFC objectives and create opportunities for other maneuver elements to exploit.

A single air component commander guides the JFC's overall counterland effort and directly supports the overall joint operation or campaign. When designated as the

supported commander, the air component commander conducts theater-wide or Joint Operations Area (JOA)-wide AI or preplanned CAS directly supporting the JFC's overall theater objectives. These objectives include the land and maritime commander's approved component target nomination lists as consolidated into the joint integrated prioritized target list (JIPTL). This functional responsibility is executed by engaging the enemy across the operational area, including in land or maritime areas of operation (AOs). AI used in this manner has the greatest overall effect on the enemy, although the observed results may be delayed compared to AI employed closer to the ground battle. For example, if theater objectives dictate, AI may operate in support of a portion of the theater where it is more closely integrated with the ground battle. This form of AI may strike targets nominated via the joint targeting process by either the air or land component and often produces results tangible to the ground commander more quickly than a theater-wide AI effort. The most detailed integration of air and land components is found in CAS, where air attacks and ground battles are combined into a single synergistic effort.

Airpower can reach any depth of the operational area from the close battle area to and beyond the enemy's heartland. Depending on the designated strategy, airpower's range enables a commander to focus counterland effects in a specific area or disperse them across the theater at any needed scale. Typically, the air component operates throughout the area of responsibility (AOR). Airpower should not be restricted to a single AO or even multiple independent AOs.

Air and land maneuver forces coordinate and cooperate in pursuit of common objectives during counterland operations, demonstrating clear unity of effort. CAS serves as a direct aerial backup for ground maneuvers, while AI of ground-designated targets indirectly aids ground operations. When air attacks target theater-wide objectives, they provide overall assistance to ground forces, directly accomplish JFC objectives, or both. Occasionally, ground actions may support air maneuvers by placing the enemy in a position more vulnerable from the air, enabling a decisive blow.

LAND WARFIGHTER PERSPECTIVE

The US Army and US Marine Corps are the principal DoD organizations that conduct military operations in the land domain. While both institutions organize, train, and equip themselves to project land power, there are differences between the purpose and core competencies of the Army and Marine Corps. The Army is the primary land force and manages crises and conducts LSCO as part of the joint force. The Army can provide joint force C2, conduct prompt and sustained land combat operations, and sustained logistics support to the joint force. Conversely, the Marine Corps is optimized to be an expeditionary force that operates on and from the sea, in and from the air, and on land. The Marine Corps can deploy multi-domain forces on short notice to respond to crises around the world and possesses organic short-term sustainment capabilities. Whereas the US Army, US Navy, US Air Force (USAF), and US Space Force (USSF) are designed to dominate their respective primary operating domains, the Marine Corps is designed to respond quickly to evolving situations and sustain itself until the joint force deploys more forces to the area.

The most likely candidate to perform the Joint Force Land Component Commander (JFLCC) role within a land AO during LSCO with multiple corps-sized formations is the Combatant Command's (CCMD's) Army or Marine Corps Service component commander. The commander of an Army corps or a Marine air-ground task force (MAGTF) (most likely a Marine Expeditionary Force [MEF]) could also be designated as a JFLCC. For smaller-scale operations, a contingency command post (CP) from a theater Army, Army division, or Marine expeditionary brigade (MEB) could be employed.

US ARMY CORE COMPETENCIES

According to Army Doctrine Publication 1, the Army maintains five core competencies:

Prompt and sustained land combat. This is the primary function of the Army. Prompt land combat requires the Army to be an expeditionary force capable of deploying task-organized forces to austere locations. Sustained land combat requires the Army to campaign with the power to conduct extended operations and consolidate gains as required to meet JFC objectives.

Combined arms operations. *Combined arms* is the synchronized and simultaneous application of arms to achieve an effect greater than if each element was used separately or sequentially. In a destructive context, combined arms operations integrate various fires capabilities so that responding to one capability makes the enemy vulnerable to another. The Army demonstrates combined arms through its integration of armored, mechanized, aviation, and indirect fire capabilities into its division and brigade combat teams (BCT).

Special Operations. Special operations provide the JFC with a variety of unique, precise, time-sensitive, and clandestine options. SOF are organized, trained, and equipped in a unique manner compared to conventional forces. The complementary and reinforcing capabilities of conventional forces and SOF enhance the strength of the Army.

Set and sustain the theater for the joint force. Setting the theater for the joint force includes establishing access and infrastructure to support joint force operations. The Army has unique capabilities to establish and maintain vital infrastructure and support to the JFC. These capabilities include intelligence support; communications; port and airfield opening; logistics; ground-based air defense; chemical defense; and reception, staging, onward movement, and integration. The Army is also tasked with providing logistical support for the CCMDs via theater sustainment.

Integrate national, multinational, and joint power on land. The Army has the largest number of headquarters (HQ) that are joint task force (JTF) HQ capable. Army HQ are designed to be the core components that integrate unified action partner capabilities into a Service HQ or rapidly transition from a Service HQ into a joint or multinational JTF or land component command.

US ARMY FORCE STRUCTURE

Army Forces (ARFOR) is the Army component of any joint force and the senior Army HQ of all ARFORs assigned or attached to a CCMD, subordinate joint force command, joint functional command, or multinational command. The theater army maintains control of all

Army units assigned to an AOR until control is passed to the senior ARFOR commander in a subordinate JOA.[3]

Understanding the roles and functions of the various Army echelons of command is essential to understanding the functionality of the Army air-ground system (AAGS). Armies, corps, and divisions provide joint or multinational forces with flexible and tailorable formations. In addition, the Army has recently added Theater Fires Commands, Theater Fires Elements, and Multi-Domain Task Force (MDTF) units, all of which provide the joint force with capable long-range fires and interdiction capability.

Fire Teams, Squads, Platoons, and Companies. These echelons, listed by increasing unit size, are the smallest echelons of Army command. A *company* is a unit with two or more platoons, between 60 - 200 soldiers, and is commanded by an Army captain. A *troop* is a company-sized unit in an Army cavalry organization (Army cavalry organizations provide mounted [ground and rotary-wing] reconnaissance and security). A *battery* is a company-sized unit in a field artillery or air defense artillery organization.

Battalions. Battalions consist of two or more company-sized units and are tactical units assigned or attached to brigades. The battalion is the smallest Army echelon with a CP and staff to execute the operations process that results in published formal orders. In cavalry organizations, this echelon is called a squadron. Battalions consist of 500 - 800 soldiers and are typically commanded by a lieutenant colonel.

Brigades, Brigade Combat Teams, and Regiments. A *brigade* is a unit with two or more battalions and a HQ company. A brigade normally contains between 2500 - 5000 soldiers and is commanded by a colonel. A *brigade combat team* (BCT) is a combined arms organization consisting of a brigade HQ and at least two maneuver battalions, and normally includes a field artillery battalion, support battalion, and a cavalry squadron. The BCT is the Army's primary combined arms close combat force whose versatility and modularity are effective across the land domain. The three types of BCTs are designated by their primary maneuver unit composition: infantry, Stryker (a *Stryker* is a type of lightly armored combat vehicle), and armored (tanks). A *regiment* is a similar-sized element to a brigade. The Army has four tactical regiments: the 2nd and 3rd Cavalry Regiments, the 75th Ranger Regiment, and the 160th Special Operations Aviation Regiment.

Divisions. A division is an echelon of command that employs multiple brigades or BCTs to achieve objectives on land. Divisions have 10,000 - 16,000 soldiers commanded by a major general. The division's primary role in LSCO is as a tactical formation commanding two to five Army BCTs with two to four functional and multifunctional brigades. The division may fulfill the ARFOR role for operations of limited scope and duration. Under such conditions, it may form the nucleus for a very small-scale JTF or JFLCC.

Corps. A *corps* is an echelon of command that employs multiple divisions and brigades to achieve objectives on land. A corps consists of 20,000 - 40,000 soldiers and is commanded by a lieutenant general. In LSCO, a corps HQ normally functions as an

[3] For more information on US Army echelons, see Air Force Tactics, Techniques, and Procedures (AFTTP) 3-2.17, *Multi-Service Tactics, Techniques, and Procedures* (*MTTP) for the Theater Air Ground System (TAGS).*

operational land HQ under the joint land component. The corps HQ is organized, trained, and equipped to control the operation of two to five divisions with supporting organizations. Joint capabilities are the primary means available to the corps commander for setting conditions and shaping the environment for division operations. When operating independently during LSCO, the corps may serve as the ARFOR or as the nucleus for a JFLCC or JTF HQ, but it requires significant joint force augmentation.

US MARINE CORPS CORE COMPETENCIES

Marine Corps Doctrine Publication 1 designates six Marine Corps core competencies:

Conducts persistent forward naval engagement and is always prepared to respond as the Nation's force in readiness. The Marine Corps is consistently forward deployed on naval vessels and in littoral areas, ready to rapidly respond to emerging crises.

Employs integrated combined arms across the continuum of competition. Marine Corps Forces (MARFOR) can conduct combined arms operations from the land, sea, and air, increasing their effectiveness.

Provides forces and specialized detachments for service aboard naval ships, on stations, and operations ashore. MARFOR provides security on US naval vessels, Navy installations, and at US embassies around the globe.

Conducts joint forcible entry operations from the sea and develops amphibious landing force capabilities and doctrine. Together with the Navy, MARFOR can swiftly project and sustain combat power ashore to conduct raids or establish a lodgment that can be used by follow-on forces to gain access to an AO.

Conducts complex expeditionary operations in the urban littorals and other challenging environments. MARFOR conducts expeditionary operations such as counterinsurgency and counterterrorism operations, train-advise-assist activities, and stability operations in multiple complex environments.

Leads joint and multinational operations and enables interagency activities. The Marine Corps introduces follow-on forces and facilitates interagency efforts in an AOR to ensure an integrated civil-military response to complex and rapidly developing situations.

US MARINE CORPS STRUCTURE

MARFOR in a theater are generally made available to the Land Component Command. While they are under the operational control (OPCON) of the commander of MARFOR in the theater, they are under the tactical control (TACON) of the JFLCC when they are made available in this way. MARFOR are task-organized into MAGTFs. A MAGTF is an air-ground combined arms organization under a single commander. MAGTFs vary in size and capability depending on their assigned or likely missions and are equipped for rapid deployment by air or sea.[4] All MAGTFs consist of four core elements:

[4] For additional information on Marine Corps structure, see Marine Corps Doctrine Publication (MCDP) 1-0 with Changes 1-3, *Marine Corps Operations.*

Command Element. The command element is the MAGTF HQ and provides C2 capabilities for planning and execution of operations. A larger MAGTF command element can serve as the land component command HQ in a JTF, and the senior Marine Corps officer in the MAGTF can act as the JFLCC.

Ground Combat Element. The ground combat element conducts ground operations in support of the MAGTF's mission. It generally consists of an infantry organization supported by artillery, reconnaissance, amphibious, tank, and engineer forces.

Aviation Combat Element. The aviation combat element conducts air operations in support of the MAGTF's mission and to project combat power. Marine Corps aviation can conduct counterair missions, assault support, AI, CAS, electronic warfare, airborne reconnaissance, and air operations C2. Marine Corps aviation consists of fixed-wing fighter, cargo, and air refueling (AR) (drogue) aircraft, as well as rotary-wing assault and cargo aircraft and unmanned aircraft systems. Marine aviation can operate either ashore from austere operating locations or afloat from an amphibious assault ship. The MARFOR commander makes recommendations to the JFC on the employment of Marine Corps aviation. The MARFOR commander may retain operational and tactical control of Marine aviation to support MAGTF operations or choose to make Marine Corps aviation available to the joint force air component commander (JFACC).

Logistics Combat Element. The logistics combat element provides all functions of tactical logistics necessary to sustain a MAGTF including supply, maintenance, transportation, health services, civil engineering, and force support services.

MAGTF Types and Echelons of Command. Marine Corps land forces use similar echelons of command as the Army from the fire team to the battalion level, and these units are task-organized to create MAGTFs. MAGTFs may be scaled in size to meet mission requirements. There are five types of MAGTFs.

- **Marine Expeditionary Force.** The MEF is the principal warfighting organization of the Marine Corps and may task-organize subordinate units into smaller MAGTFs to support a combatant commander's response to a crisis. A MEF can include up to 40,000 Marines and is commanded by a lieutenant general. There are three standing MEFs: I MEF and II MEF, based on the west and east coast of CONUS, and III MEF, based in Okinawa, Japan. Each MEF is comprised of a Marine division (the ground combat element), a Marine Aircraft Wing (the aviation combat element), and a Marine Corps Logistics Group (the logistics combat element). A MEF can sustain itself for 60 days before external support is required.

- **Marine Expeditionary Force (MEF) (Forward [Fwd]).** A MEF (Fwd) can either be the lead echelon of a MEF or a standalone MAGTF that is deployed on a rotational basis. A MEF (Fwd) may be comprised of slightly smaller ground and aviation combat elements and is commanded by a major general.

- **Marine Expeditionary Brigade.** A MEB is a mid-sized MAGTF capable of the full spectrum of Marine Corps capabilities. A MEB has approximately 16,000 Marines and is commanded by a brigadier general. A MEB consists of a command element capable

of providing a JTF or land component HQ, a ground combat element of an infantry regiment reinforced by additional fire support, an aviation combat element capable of the full scope of Marine Corps aviation missions, and a logistics combat element capable of sustaining the MEB for 30 days.

- **Marine Expeditionary Unit (MEU).** A MEU provides a continuous forward naval presence ready to conduct steady-state security cooperation, military engagement, deterrence, and contingency response operations. A MEU has approximately 2,000 Marines and is commanded by a colonel. A MEU is formed around an infantry battalion landing team reinforced with additional fire support and a Marine Corps composite aviation squadron of both fixed and rotary-wing aircraft. A MEU embarked on a Navy amphibious ready group (ARG) forms an ARG/MEU. An ARG generally deploys in a three-ship group of amphibious assault ships and dock landing ships. The ARG vessels are commanded and crewed by Navy personnel, and the ARG and MEU commanders develop a supporting/supported relationship to accomplish MAGTF objectives while afloat.

- **Special Purpose MAGTF (SPMAGTF).** A SPMAGTF may be formed when an existing MAGTF is unavailable or inappropriate for a specific situation. A SPMAGTF may be any size up to a MEU and is either task-organized from nondeployed forces or generated on a contingency basis from deployed forces.

LAND WARFARE TERMINOLOGY AND CONCEPTS

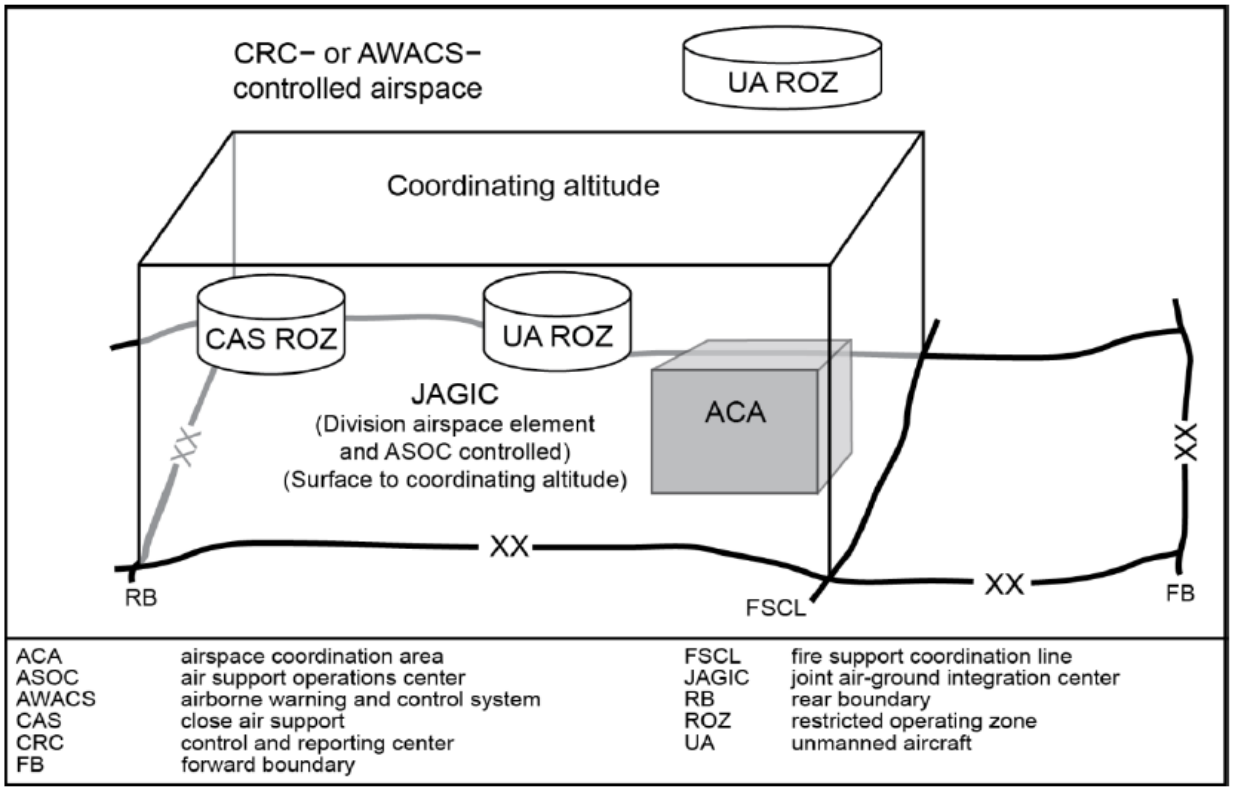
Deep Area and Close Area. The deep area is the portion of a commander's AO that is not assigned to subordinate forces. The close area is the portion of a commander's AO assigned to subordinate forces. This clarification on deep and close areas aids in understanding which HQ is primarily responsible for the AO's interdiction efforts. Each echelon is responsible for planning the priority, effects, and timing of interdiction, primarily in its deep area and secondarily in its close area. Operations in the deep area involve operations that attempt to prevent uncommitted enemy forces from being committed coherently. Air component counterland operations conducted beyond the deep area shape the future operating environment for a land component conducting offensive operations. Conversely, if the land component is conducting defensive operations, air component operations in the deep area and beyond reduce the combat effectiveness and operational reach of enemy land forces.

Direct Fire and Indirect Fire. *Direct fire* is fire delivered on a target using the target itself as a point of aim for either the weapon or the director. Examples include rifle/machine gun fire or fires from the main cannon of a tank. Direct fire requires a clear line of sight between the weapon and the target. It is therefore limited in range and generally employed solely against the enemy's front echelon of forces. *Indirect fire* is fire delivered beyond the line of sight of the weapon and aimed using either forward land or air-based observers or against fixed points on the ground. Examples are artillery, mortar, and rocket fire. These fires are delivered on an arc trajectory that requires deconfliction of the airspace above the battlefield. Indirect fires are considered a subset of "fire support," which also includes air support, operations in the information environment, cyber operations, and electromagnetic spectrum operations (EMSO). Fire support can range

enemy forces throughout the depth of their deployment and allow the land force commander to shape and prepare the battlefield in depth. Land force commanders may prioritize fire support operations (air support and indirect fire) against adversary indirect fire systems to enable freedom of maneuver and force protection to friendly forces and civilian infrastructure.

Land Component Use of the Air Domain. Land component forces use the air domain to facilitate operations on the battlefield. Land component forces use fixed-wing aviation and unmanned systems to conduct intelligence, surveillance, and reconnaissance (ISR) of the battlefield and operations in the information environment. In addition to fires provided by rotary-wing aircraft (such as attack helicopters), indirect fires (such as the Army Guided Multiple Launch Rocket System and the Army Tactical Missile System) are also airspace users. Both the Army and the Marine Corps use fixed and rotary-wing aviation to provide movement and maneuver capability to fielded forces, as well as sustainment of those forces. The Army and Marine Corps also conduct air and missile defense (AMD) of airspace over friendly land forces, air forces, and airfields to provide force protection against enemy aircraft, missiles, and unmanned aircraft systems.

The land component's heavy use of the air domain to facilitate land operations requires planning and coordination between the land and air components to manage and control airspace use. The Army and the Marine Corps differ in how they conduct airspace management and airspace control over their respective AOs.



US Army division-assigned airspace.

(From AFTTP 3-2.86, *Joint Air Ground Integration Center*)

Army Division Airspace Management and Airspace Control. Within an AOR, the Combatant Commander delegates control of the airspace to the airspace control authority (ACA), usually the JFACC. As the designated commander responsible for airspace control across the AOR/theater, the ACA coordinates and integrates airspace use under JFC authority within the AOR. The ACA may delegate control authority for a volume of airspace over the joint force land component's AO to the JFLCC. However, the Army is not organized, trained, or equipped to control this volume of airspace without USAF augmentation. Airspace control can be provided within the boundaries of division-assigned airspace by the joint air-ground integration center (JAGIC). The JAGIC is comprised of division fires, airspace, AMD, aviation personnel, the air support operations center (ASOC), and the tactical air control party (TACP). The JAGIC provides procedural airspace control of division-assigned airspace and manages airspace coordination measures. Division-assigned airspace normally extends from the division rear boundary to the fire support coordination line (FSCL), left to right to the limits of the division AO, and upward to the coordinating altitude. The surface dimensions of division-assigned airspace may be less than, or equal to, the dimensions of the division-assigned AO. Army airspace planners work with the USAF's Air Liaison Officers (ALOs) to plan for the control of air and land component aircraft operating within the division's airspace and to deconflict those aircraft with indirect fires. Once the airspace control plan for the division is developed, the division sends coordination measures to the ACA for inclusion in the theater's ACO. Joint aircraft operating within division-assigned airspace and fires delivered by joint aircraft within the division's AO are under the control of the ASOC and TACP personnel. See Figure "US Army division-assigned airspace" and reference Chapter 3: Air Interdiction for more information.

Marine Corps Airspace Management and Airspace Control. As an expeditionary and multi-domain force, the Marine Corps provides airspace control entities as part of the Marine Air Command and Control System (MACCS). These include the Marine Tactical Air Command and Control Center (TACC), which is comparable to the Air Operations Center (AOC); the Tactical Air Operations Center (TAOC), similar to a Control and Reporting Center (CRC); the Direct Air Support Center (DASC), comparable to an ASOC; the Forward Air Controller (FAC), either ground-based or airborne; and the JTAC. Similar to designating "division-assigned airspace" to the Army, the ACA (the JFACC) could delegate control of a volume of airspace over MARFOR to a Marine Corps commander that possessed the appropriate MACCS entities required to control that airspace. However, when the Marine Corps is conducting amphibious operations, the ACA normally designates the maritime component commander as the controlling authority for a specific airspace control area known as an Amphibious Objective Area (AOA).[5]

[5] For additional information on airspace control for amphibious operations, see AFDP 3-04, *Countersea Operations.*

Shifting Air-Land Integration Paradigms: Lessons from the Russo-Ukraine Conflict

AFDP 1, *The Air Force*, states that "Control of the air is a necessary precondition for control of the surface." The last twenty years of counterland operations in the CENTCOM AOR has been characterized by counterinsurgency driven AI and CAS conducted under conditions of *air supremacy*. This has enabled on-call CAS and AI sorties to quickly respond to land component air support requests and deliver air-surface fires against the enemy with relative impunity. However, lessons learned from the LSCO battlefield of the Russo-Ukraine conflict reveal a different paradigm for air-land integration on future battlefields.

For a variety of reasons, the airspace over the Russo-Ukraine battlefield remains in a state of *air parity*, with neither side able to establish control and both sides continuously contesting the airspace. The battlefield is characterized by a credible air-air threat presence, widely proliferated advanced air defense systems (shoulder-launched missiles and radar guided surface-air missile systems), large exchanges of surface-surface fires and cruise missiles, and thousands of small unmanned aircraft systems (sUASs). These factors combine to make airspace control and air-land integration especially challenging in a LSCO environment. This change in paradigm poses several considerations. For air component commanders, the Russo-Ukraine conflict "reaffirms that air superiority remains job number one". Air planners will need to carefully balance resources to ensure the appropriate level of air superiority is gained or maintained to enable strategic attack, AI, and CAS operations, and those operations need to be carefully prioritized against JFC objectives. Land component commanders will need to recognize that allocated on-call CAS and AI in support of land component objectives will be highly contested. Both component commanders will also need to consider how to provide C2, airspace control, and air defense of airspace assigned to the land component, especially with regard to sUAS. Rapid advances in sUAS technology and the inclusion of artificial intelligence/machine learning into sUAS platforms has increased sUAS effectiveness on the battlefield despite the contested nature of the airspace and the electromagnetic spectrum. Finally, air-land integration on LSCO battlefields must consider the integration of allied and partner land and air forces. Allied and partner integration within C2 organizations such as the CAOC, BCD, and JAGIC will be crucial to enabling the integration of combined air and land component operations.

Derived from "Air Superiority: A Renewed Vision"
Gen James Hecker, *AETHER*, Vol. 3, No. 2, Summer 2024

CHAPTER 2: COMMAND AND CONTROL OF COUNTERLAND OPERATIONS

Command and control (C2) is the exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. The commander generally designated to C2 counterland operations is the JFC's air component commander. This chapter will address the role of the air component commander, the C2 systems that support the execution of AI and CAS, and general considerations for counterland operations.

> "The Air Force organizes, trains, and equips forces to be an air component to a joint force commander (JFC). As part of the joint force's air component, our forces must be prepared to accomplish JFC objectives**.** The air component commander's administrative authorities are derived from Title 10, U.S. Code, and exercised as the commander, Air Force forces (COMAFFOR). The air component commander's operational authorities are delegated from the JFC and exercised as both the COMAFFOR, over Air Force forces, and as the functional joint force air component commander (JFACC), over joint air forces made available for tasking. Thus, the air component commander leads Air Force forces as the COMAFFOR and the JFC's joint air operations as the JFACC. This duality of authorities is expressed in the axiom: Airmen work for Airmen and the senior Airman works for the JFC."
>
> **-- Air Force Doctrine Publication (AFDP) 1, *The Air Force***
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> **Since the COMAFFOR and JFACC are nearly always the same individual, this AFDP will use the term "air component commander" when referring to duties or functions that could be carried out by either or both, unless explicit use of the term "COMAFFOR" or "JFACC" is necessary for clarity.**

THE AIR COMPONENT COMMANDER

The air component commander executes decentralized counterland operations through the mission command framework of centralized command–distributed control–decentralized execution (CC-DC-DE).[6] This framework ensures unity of effort on essential JFC objectives, optimizes counterland assets, and supports the joint principle of unity of command. To accomplish this, the air component commander normally provides the JFC with an air apportionment recommendation and conducts the operations process to design, plan, prepare, execute, and assess air operations based on the JFC's guidance. Through distributed control, the air component commander delegates authorities to subordinate commanders to conduct their assigned operations through decentralized execution. Decentralized execution allows detailed mission planning and execution at the lowest practical level, reducing vulnerabilities and enabling commanders to seize the

[6] For additional information on the mission command framework, see AFDP 1-1, *Mission Command*.

initiative. It also ensures effective employment of limited assets, allows tactical adaptation, and accommodates the Services' different employment concepts and procedures.

ROLES AND RESPONSIBILITIES

The air component commander is normally the supported commander for the JFC's overall AI effort, while land and maritime component commanders are supported commanders for interdiction in their AOs. In coordination with the AO commander, the air component commander, if designated by the JFC to execute theater- or JOA-wide AI, has the latitude to plan and execute AI operations within the land or maritime AO. To execute these operations, the air component commander should coordinate with the AO commander to avoid adverse effects and friendly fire incidents.

The JFC apportions CAS and AI based on his overall strategy and the air component commander's recommendation. The air component commander allocates CAS sorties in response to ASRs. AI is allocated in response to target nominations submitted by other component commanders to support the JFC's apportionment decision. Both CAS and AI missions are assigned via the ATO.

"Since we began Operation IRAQI FREEDOM on the 19th of March, United States and United Kingdom ships have fired over 800 Tomahawk missiles in support of General Franks' campaign. Sailors and ships…we coordinate all those targets with the Air Force. As I think you all talked last week with General Buzz Moseley, he is the air component commander, and so all offensive air operations, manned or unmanned, are coordinated with—through Buzz Moseley's targeting shops. So, any target that we're assigned and told to prosecute, that is vetted with Buzz Moseley's air component command headquarters."

-- Admiral Timothy Keating, 12 April 2003

C2 SYSTEMS

C2 systems include all the resources, personnel, facilities, equipment, communications and procedures essential for a commander to conduct the operations process for assigned operations. The primary C2 system for counterland operations is the Theater Air Control System (TACS). The TACS is the USAF system within the JFC's theater air-ground system (TAGS).[7] This discussion will focus on the TACS, as it is the air component commander's C2 mechanism.

[7] For more information on TAGS, see AFTTP 3-2.17, *MTTP for the TAGS*.

THEATER AIR CONTROL SYSTEM

The TACS consists of airborne and ground elements to conduct tailored C2 of air operations. The air component commander ensures all elements of the TACS are in place, including liaison positions, which are filled before, or soon 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.

Air Operations Center (AOC). The AOC is the senior element and primary C2 node of the TACS. It includes personnel and equipment from necessary disciplines to ensure the effective planning and conduct of operations (e.g., communications, operations, intelligence, etc.). When the COMAFFOR is appointed as the JFACC, the AOC becomes a JAOC[8] and is normally the HQ where the JFC draft JIPTL is built based on the component target nominations. Those target nominations begin the AI allocation process in support of the JFC's apportionment guidance. Similarly, liaisons bring their component's ASRs to the AOC for CAS, which begins the AOC's allocation of CAS.

Control and Reporting Center (CRC). The CRC is a deployable ground-based airspace control element that manages air component missions as specified in the ATO. For example, during CAS missions, the CRC may relay the current situation update from the ASOC to ingressing CAS aircraft. It may receive battle damage assessment from egressing aircraft for immediate relay to the ASOC. For AI missions, the CRC may relay updates from previous AI missions to ingressing AI assets to improve the situational awareness of the inbound AI assets.

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

Airborne Warning and Control System (AWACS). AWACS is normally the air component commander's first tactical C2 element to arrive in the theater. Its primary mission is to conduct air surveillance, identify airborne objects, and control air operations. AWACS provides the deep look capability to support offensive and defensive air operations. In addition, it provides low-level and extended radio coverage for the control of air operations. AWACS performs these roles as the primary C2 extension of the AOC until such time that the CRC can be employed. As an ASOC serves as the air component commander's airspace control element within ground force element assigned airspace, AWACS is normally the airspace control element responsible for airspace control outside and above division-assigned airspace.

[8] Although the AOC becomes a "JAOC" when joint, the term "AOC" will be used throughout this publication.

Air Support Operation Center (ASOC). The ASOC is the primary control agency of the TACS for the execution of airpower in direct support of land operations. As a direct subordinate element of the AOC, the ASOC is responsible for directing and controlling air operations in its assigned area. The ASOC is aligned at the Army echelon above brigade most capable of integrating fires and effects and procedural control. When co-located with a division, the ASOC can form the JAGIC by integrating with the division fires element, airspace element, AMD, and aviation elements. Within assigned airspace, the close proximity of friendly forces and enemy forces requires integration with other supporting arms and ground forces to prevent friendly fire incidents.[9]

The AOC may 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 retargeting authority to the ASOC for specific AI missions will depend on actual circumstances, including the timeliness required for getting desired effects on the target.

Operation ENDURING FREEDOM Theater Air Control System

During the initial stages of Operation ENDURING FREEDOM, there was no conventional Army corps deployed to Afghanistan. At this time, the ASOC was aligned with the Army's corps. Thus, an ASOC was not deployed to handle CAS requirements.

Prior to March 2002, land forces in Afghanistan consisted of limited numbers of special forces Operational Detachment Alphas (ODAs) geographically spread across the country. The lack of an ASOC had little effect on air operations. However, Operation ANACONDA signaled a change from SOF-centric operations to conventional land force operations. Unfortunately, the conventional force used in Operation ANACONDA was a partial division, not a corps, thus no ASOC deployed to Afghanistan. This degraded airpower in several ways.

Counterland assets spent valuable time and fuel seeking information normally found in the ASOC-provided situation update. This caused FAC(A)s to become saturated with real-time target updates, target prioritization, and aircraft deconfliction in the target area. Without the situation update, a lack of mission essential information hindered efficient CAS integration.

Three principles should be considered when employing an ASOC.

- 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 in concert.
- An ASOC should be deployed to a relatively secure location. Friendly ground forces lose a significant force multiplier if the ASOC is taken out through enemy action. However, security should be weighed against radio limitations.

[9] For additional information on the ASOC, see AFTTP 3-2.17, *MTTP for the Theater Air-Ground System*.

- An ASOC needs the ability to communicate with aircraft. Thus, the ASOC should be located where it can maintain line-of-sight communications with aircraft to its maximum operating depth.

Tactical Air Control Party (TACP). The TACP is a subordinate operational component of the TACS designed to provide air liaison to land forces and for the control of aircraft. TACP are organized into expeditionary air support operations groups (ASOG) or air support operations squadrons (ASOS) that are aligned with their respective Army corps, divisions, or brigades. The TACP has two primary missions: advise ground commanders on the capabilities and limitations of air operations and provide the primary TAC of CAS. TACP coordinate ACMs and FSCMs and deconflict aircraft with other fire support. TACP are generally composed of the following:

- **Air Liaison Officer (ALO).** The ALO is the senior TACP member attached to a ground unit who functions as the primary advisor to the ground commander on air power. An ALO is an expert in the capabilities and limitations of air operations. The ALO plans and executes CAS in accordance with the ground commander's guidance and intent. At the battalion level, the senior member of the TACP is called the battalion ALO, a specially trained and experienced non-commissioned officer. Additionally, ALOs may be certified and qualified to serve in the JTAC role.

- **Joint Terminal Attack Controller (JTAC).** A JTAC is a qualified (certified) service member who, from a forward position, directs the action of combat aircraft engaged in CAS and other offensive air operations. Additionally, the JTAC provides recommendations on integrating CAS with the ground commander's scheme of maneuver.[10]

In some instances, the JFACC (through coordination with the JFC, JFLCC, JFSOCC, or JFMCC) may employ USAF TACP outside of land or maritime areas of operation to extend TACS communications architecture forward into non-permissive contested environments. The TACP integrates and synchronizes effects by providing communications resiliency, tactical C2 extension, and terminal guidance operations (TGO). When employed by the JFACC, a USAF C2 element will be the primary control agency for the subordinate TACP. When the JFACC is the supported commander, USAF C2 elements are TACON to the JFACC. Examples of C2 elements employed in this manner may include the agile control and integration team (ACIT) and integrated sensing and effects team (ISET).

[10] For additional information on terminal attack control roles and responsibilities, see AFTTP 3-2.6, *MTTP for Joint Application of Firepower*.

- **Agile Control and Integration Team (ACIT).** The ACIT is a ground-based USAF C2 element comprised of TACP, functioning on behalf of the JFACC, and may combine with other C2 entities or elements. It relies on rapid deployment capabilities to create localized and dispersed nodes, providing limited command of airspace pockets and control (positive or procedural) for integration of Joint fires across multiple domains in support of the air scheme of maneuver.

Air Support Operations Group (ASOG) and Air Support Operations Squadron (ASOS)

The ASOG and the ASOS are the USAF institutional elements that provide the JFACC with TACS capabilities that integrate with the land component. Both the ASOG and ASOS are tasked to provide air support liaison capability to assist in planning and execution of the TACS capabilities via TACP C2 elements (for ASOC or ACIT functions), and TACP Strike elements (for integration with maneuver units, such as battalion JTACs). The portion of the TACS in direct support of the land component commander and his subordinate echelons ensures airpower is integrated with the ground scheme of maneuver. While the ASOG and ASOS may be aligned with ground force elements, these organizations remain under the OPCON of the COMAFFOR.

Air Support Operations Group. In garrison, the Air Force provides an ASOG in support of an Army corps. When deployed, the Air Force provides an ASOG to support a corps when the corps operates as the senior tactical echelon. The ASOG includes a corps TACP and the appropriate C2 architecture. The corps TACP provides air-ground integration, planning, and execution capabilities in direct support of the corps. When deployed, the ASOG becomes the expeditionary air support operations group.

Air Support Operations Squadron. The Air Force aligns an ASOS to support a division and maneuver echelons. The ASOS includes division, brigade, and battalion TACPs and an ASOC. The ASOS provides air-ground integration, planning, and execution capabilities in support of ground maneuver commanders.

- **Integrated Sensing and Effects Team (ISET).** The ISET is a TACP team that integrates with Joint service or partner nations capable of employing at the Forward Edge of the Battle Area. It provides a tactical advantage through advanced sensing grids, establishes or expands ground-based C2 mesh networks, and provides procedural control of net-enabled weapons, aircraft, and long-range precision fires.

GENERAL CONSIDERATIONS

In general, CAS and AI missions flown in direct support of the land component commander are controlled by the JFACC and directed by various elements of the TACS. Direct control of AI missions, resulting from component commander target nominations, rests with the airspace control elements. This section will discuss command relationships, AI considerations, and CAS considerations for employing airpower.

COMMAND RELATIONSHIPS

Command relationships are critical to understanding the authorities that the air component commander exercises through their different roles. For example, USAF elements of the theater air control system (TACS) assigned with ground units are under the operational control (OPCON) of the COMAFFOR, and tactical control (TACON) of the JFACC. These relationships enable an ASOC to be co-located with a ground echelon and have the delegated authority to control not only USAF assets, but also joint air assets employed in direct support of ground forces.[11]

AIR INTERDICTION CONSIDERATIONS

Due to the air component commander's theater or JOA-wide perspective, and to further enhance integrated planning of interdiction, the JFC may delegate the air component commander overall responsibility for planning and coordinating all interdiction operations outside of land component AOs. In this scenario, the air component commander normally establishes the specific priorities for theater-wide AI and applies these priorities to AI targets located inside and outside any land or maritime AO. Land component commanders can determine specific AI targets, and following the JFC's joint targeting cycle, provide target nominations that include requested effects to the air component that allow more leeway in tactical mission planning and more efficient use of the apportioned airpower.

Using the JFC's joint targeting cycle allows the air component commander to determine best how to support land or maritime commanders, who in turn, receive more effective airpower support. If targeting outside of their assigned AOs with organic fires, commanders must coordinate those fires with the air component commander to deconflict with ongoing JOA-wide AI operations and with the airspace coordination areas for airspace deconfliction.

This delegation of planning and coordinating AI responsibility has historical precedent through interdiction procedures during Operation IRAQI FREEDOM (OIF).

AI Integration with Special Operations. There may be occasions where the joint force special operations component commander (JFSOCC) is a supporting commander for AI sorties. Whether operating under the control of the air component commander or the JFSOCC, SOF and airpower maneuver elements should be closely coordinated to ensure synchronization and prevention of friendly fire incidents. SOF aviation and ground assets are integrated closely in all joint air operations from planning through execution. To ensure this, the JFSOCC usually provides the air component commander a special operations liaison element (SOLE) to coordinate, synchronize, and deconflict SOF operations with air component forces.

CLOSE AIR SUPPORT CONSIDERATIONS

Land component commanders usually request CAS in advance of operations as part of their overall concept of operations. They distribute allocated CAS to ground commanders

[11] For additional information on command relationships, see JP 1, Vol 2, *The Joint Force*.

based on anticipated prioritized requirements and the ground commander's scheme of maneuver. Distribution is accomplished through aligned TACS elements. The air liaison function should also guide ground commanders 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 ground commander's AO.

CAS Integration with Special Operations. Within a joint special operations area, JFSOCC is generally the supported commander for CAS. At the request of the JFSOCC, the air component commander provides elements and C2 nodes to SOF to include placing a liaison or C2 element with the JFSOCC, joint special operations task force, or other SOF elements.

CHAPTER 3: AIR INTERDICTION

AI represents a flexible form of airpower that can be used in various ways to prosecute joint all-domain operations. AI can channel enemy movement, constrain logistics, disrupt communications, or force urgent movement that puts the enemy in a favorable position for friendly forces to exploit. To be most effective, AI requires persistence, concentration, joint integration, and timely, accurate intelligence. AI provides a powerful tool for defeating the enemy ground forces, whether supporting the land offensive by attacking land component nominated targets or decisively halting an enemy advance with theater-wide interdiction.

The air component often conducts theater-wide air attacks against enemy ground forces and their resources to achieve JFC objectives. This use of AI usually occurs outside a land or maritime component's AO. However, by understanding JFC priorities and understanding the land or maritime component's scheme of maneuver, the air component commander can employ AI to provide effects that facilitate the maneuver of other components. Ground commanders often consider AI synonymous with "shaping" operations within their AO, while from an Airman's perspective, shaping may be regarded as preparing the operational environment with AI effects to assist the land component's scheme of maneuver.

Counterland Operations during Operation IRAQI FREEDOM (OIF)

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

AIR INTERDICTION FUNDAMENTALS

The joint definition of AI is, "air operations to perform interdiction 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".[12] The USAF further refines the definition as air operations conducted to divert, disrupt, delay, or destroy the enemy's military potential before being brought to bear effectively against friendly forces or to otherwise achieve the JFC's objectives.

In a joint campaign, AI needs to be under the direction of a single commander who can exploit and coordinate all forces involved. **The air component commander is normally the supported commander for the JFC's overall AI effort.** When designated as the supported commander, the air component commander conducts theater-wide or JOA-wide AI per the JFC's overall theater objectives. Aided by the component and Service liaisons, the air component commander recommends theater or JOA-wide targeting priorities and, in coordination with other component commanders, forwards the air apportionment recommendation to the JFC. The air component commander plans and executes the interdiction effort following the JFC's guidance.

Because of the air component commander's theater-wide perspective and joint planning capabilities, the JFC may also delegate responsibility for planning and coordinating all interdiction operations, including those outside of land component commanders' areas of operations, to the air component commander.[13] Nevertheless, in most joint campaigns, AI amplifies, supports, and enables the ground scheme of maneuver.

AIR INTERDICTION OBJECTIVES

AI objectives describe the air component's interdiction goals and differ with every situation. These goals can have a significantly impact on the course of an operation. When developing AI objectives, planners should consider potential second- or third-order, unintentional, or undesired effects that achieving those goals may create.

To maximize the influence AI has on an enemy, commanders should understand how the objectives differ depending on the nature of the conflict. AI objectives against an enemy with minimal logistics requirements, a simple force structure, and primitive logistics systems differ from those when facing a highly mechanized, modern force possessing extensive logistics requirements (such as potential peer or near-peer rivals). Interdiction against enemy forces and logistics without regard to the overall theater situation may be largely ineffective. Therefore, planning for interdiction should be integrated into the JFC's overall planning process.

Whether the USAF 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 can influence the movement of enemy ground forces, forcing them to maneuver through or along predictable avenues due to the lack of transportation routes, obstacles,

[12] For additional information on joint interdiction, see Joint Publication (JP) 3-03, *Joint Interdiction*.
[13] The interplay between theater, JOA, and area of operations perspectives can be found in JP 3-0, *Joint Campaigns and Operations*.

and other geographic constraints. Attacks on enemy lateral lines of communication (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, where it can move, and the means required to move the force. Generally, the fewer routes available, the greater the damage imposed by severing those routes. In cases where geography favors the rapid movement of enemy forces, AI assets can create artificial or temporary chokepoints by striking bridges or tunnels.

It is important for planners to consider the most effective relationship between land and air components. In some situations, the air component acting in a supported role can achieve the greatest effects, leveraging land component maneuver to funnel the enemy forces into a location more suitable for an airborne strike. Ultimately, thorough coordination with land component planners is paramount in crafting a complimentary scheme of maneuver.

CONSTRICTING THE ENEMY'S LOGISTICS SYSTEM

Heavy ground combat creates demands on fielded forces and speeds the consumption of vital war materiel. As this demand increases, interdiction operations can have an accelerated impact for two reasons. First, the enemy under pressure may be forced to use up stockpiles reserved for ongoing or future operations. Second, rapid consumption drives an enemy to use more direct routes, making them more vulnerable to interdiction attacks. Of note, an enemy force fighting under static conditions is typically more affected by the destruction of munitions, while a highly mobile enemy is disrupted by the loss of fuel and transportation.

Disrupting the enemy's distribution system hinders its ability to redistribute assets and counter friendly operations. When attacking the enemy's logistics systems, it is usually 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 an enemy's logistics systems, even sequentially.

The enemy transportation system should also be broken down into components when analyzing for critical vulnerabilities. Most transportation systems consist of the conduit for travel (roads, rail, etc.) and the vehicles used to transport troops or supplies along the conduit. They also consist of the energy required for those vehicles (typically fuels or electricity), the C2 to manage and repair the transportation system. Loading and unloading points such as rail yards, harbors, and airfields can be particularly valuable targets, as they often contain large concentrations of enemy forces or supplies.

When analyzing an enemy's transportation network for importance to their overall strategy, all possible uses for such a system should be considered. For example, planners or engagement authorities conduct a proportionality analysis before deciding to interdict the enemy's transportation network to consider surplus capacity, adverse impact on the civilian population, potential use by friendly forces, and reconstitution capability. Failure

to consider cascading effects has prevented success of large-scale AI efforts, as was the case with the Ho Chi Minh Trail bombing 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. For example, C2 attacks may seek complete isolation of enemy combat forces from higher headquarters. This may force the enemy to use less capable, less secure backup communication systems that friendly forces can more easily exploit. If the enemy employs rigid, top-down C2 and has not had an extensive preparation period to exercise their plans, or if the conflict has advanced beyond the initial stages, they can be particularly vulnerable to the disruptive effects of C2 interdiction. Conversely, an enemy that practices a high degree of C2 autonomy is less likely affected by attacks on their C2 network. If the enemy has been in a static position for a long period before an operation, they are likely prepared for offensive or defensive actions. Under such circumstances, attacks on enemy C2 are less likely to yield significant results, as the enemy can still react in a scripted manner. However, once enough time has elapsed for events to overcome a preplanned response, attacks on enemy C2 could impair their ability to respond and pay larger dividends on the battlefield.

In some circumstances, such as when operations force the enemy to react to friendly maneuvers, destroying their C2 architecture could be counterproductive. The capability to affect the enemy through information operations should also be considered. This approach may lead to better overall results while freeing up conventional attack assets for other missions.

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 friendly 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. In any case, urgent movement implies the enemy has a strong incentive to achieve specific objectives within time constraints, which 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. Friendly forces should deny the enemy mobility when needed most to capitalize on such opportunities. Timely 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 to exploit the capabilities of interdiction and opportunities that AI operations create. Friendly forces should take full advantage of all ISR assets to predict and detect these movements.

ATTRITION OF THE ENEMY

AI can attrit enemy forces and materiel, tipping the balance of combat power in favor of friendly forces. Resources, terrain, weather, enemy actions, and enemy characteristics are just a few variables to consider when developing an AI strategy.

Directly attacking individual enemy forces may not be 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 significant number of individual targets, especially when dispersed or dug in. Often, an indirect approach that isolates enemy formations by destroying logistics networks, sustainment capability, or support infrastructure can achieve more widespread results with less expenditure of munitions.

Enemy characteristics influence an attrition-based strategy.[14] The number and vulnerability of enemy fielded force components and the enemy's ability to replace its losses should be weighed against the expected results of targeting the supporting infrastructure. The enemy's mobility also influences the ability to destroy enemy fielded forces. 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. Similarly, terrain and weather affect the ability to attrit enemy forces. For 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.

During Operations DESERT STORM and IRAQI FREEDOM, the presence of coalition ground forces compelled 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 ground forces, the Serbians were able to use dispersion, deception, and concealment tactics effectively. Thus, a friendly ground maneuver that forces an enemy to react and become predictable can make an attrition strategy more effective. Retreating enemy forces remain a legitimate target in AI operations, as such forces may be available for later use by the opposing commander.

AIR INTERDICTION EFFECTS

AI achieves the purpose of joint interdiction by creating desired effects or conditions on enemy surface capabilities. An AI operation does not need to focus on creating a single type of effect. Typically, AI creates multiple effects on the enemy. For example, the enemy army traveling to the front while under air attack will suffer some 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 AI effects:

[14] For additional information on attrition-based strategy, see AFDP 3-0, *Operations and Planning*.

- **Divert.** AI diverts enemy fielded forces from operationally critical areas to a location more favorable to the JFC or around established LOCs. For example, AI may force the enemy to divert resources to repair damaged equipment and facilities and task additional enemy forces to keep existing LOCs open.

- **Disrupt.** AI planners should focus on the enemy's critical vulnerabilities to disrupt C2, intelligence collection, transportation, and supply lines (e.g., ammunition or POL). In addition, planners should consider the psychological effect on the enemy's morale and will. When analyzing the enemy, considerations include the enemy's strategy, current operational situation, mitigation options available to the enemy, and time before the enemy is affected by friendly actions.

- **Delay.** Delaying the enemy allows friendly forces to recover, react, and gain momentum. While its purpose is to improve the JFC's operational environment, for a delay to significantly impact combat operations, the enemy must face urgent movement requirements in support of its operations. Ideally, by the air component maintaining the initiative, the opponent is forced to make unplanned urgent movements at times and places that maximize its exposure to additional friendly targeting. Delaying enemy operations can also prolong the time they are at risk of attack, such as vehicles amassed behind a damaged route segment.

- **Destroy.** Destruction of the enemy ground forces, supporting elements, and supplies are the most direct of the four objectives of AI, and may provide synergy among the four effects of AI. The enemy's perception of its imminent destruction can achieve substantial delay and diversion of enemy resources. 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 when transportation systems remain largely undamaged.

AI has historically been most effective in linear combat against a modern, mobile, conventional force that requires significant resources. The timing and magnitude of results vary depending on where AI is conducted and desired objective. AI conducted deep in the operational area usually produces protracted effects that take longer to occur, while AI conducted near the front lines typically produces immediate but geographically limited effects. The success AI operations are realized when they influence an enemy's ability to command, mass, maneuver, supply, and reinforce combat forces during major operations and campaigns.

In asymmetric warfare, the AI effects of disrupting enemy supply operations, destroying weapons caches, or denying sanctuary to insurgents may occur through timely and accurate intelligence and persistent operations. However, the effects of such actions may be negligible against an insurrection during stabilization activities where the enemy employs a shadowy force structure, a simple logistics net, and unconventional tactics.

TYPES OF AIR SUPPORT REQUESTS FOR AIR INTERDICTION

Air Support Requests (ASRs) for interdiction fall into two categories: preplanned and immediate. A variety of factors influence each type of request. Unless time constraints dictate otherwise, preplanned requests should 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 minimal losses and collateral damage. Attacking mobile or short-notice targets provides a more flexible response that can capitalize on time sensitive opportunities. Still, a lack of mission planning can reduce effectiveness, increase the risk of causing collateral damage, and higher friendly losses may be expected. Real-time information technology and digital cockpit imagery reduce, but do not eliminate, these factors. Kill box operations can also add a flexible response option, enabling timely and effective coordination and control as well as facilitating rapid attacks. Finally, combining the traditional aspects of both airspace coordinating measures (ACM) and the FSCL enables expeditious air-to-surface attack of targets that can also be augmented by or integrated with surface-to-surface indirect fires.[15]

PREPLANNED REQUESTS

Preplanned AI is used to strike specific targets identified in advance, with detailed intelligence information available to support strike planning. Preplanned attacks are typically 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). Information about scheduled AI targets can come from various sources, including overhead reconnaissance to ground-based observers such as SOF or TACP personnel. Preplanned AI is conducted within the normal air tasking cycle and provides enough time for close coordination with other joint force components, which is critical for effective integration and to avoid duplicating efforts. Preplanned AI requests evolve into either scheduled or on-call missions.

- **Scheduled missions** are planned for air attacks on targets that are to be delivered at a specific time. The ASOC usually coordinates the airspace control requirements for preplanned AI requests flown short of the FSCL.[16] Scheduled missions allow aircrews more time to study the target, reducing threat exposure and allowing mission planners to optimize the weapon's fusing for maximum effect. Preplanning allows for optimum packaging of strike and support assets.

- **On-call missions** are planned against targets of opportunity for which a need can be anticipated, but the effects are delivered upon request or are linked to the location of a target rather than a specific time. On-call AI missions are by nature responsive and flexible. The appropriate C2 agency directs on-call assets to a specific target, kill box, or target area. Target priorities are generally provided via the Air Operations Directive (AOD) or may be passed in flight through a C2 node. When on-call missions are flown in direct support of the land component, the target priorities should reflect those

[15] For additional information on ACMs, see JP 3-52, *Joint Airspace Control*.
[16] See AFDP 3-52, *Airspace Control, f*or additional information.

established by the land component and communicated via the appropriate component liaison officer within the theater air-ground system (TAGS).[17]

IMMEDIATE REQUESTS

Immediate AI requests may arise during a battle and are therefore not part of the normal air tasking cycle. These requests are typically in response to unscheduled 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 before execution, even if those requests fall inside the normal 72-hour air tasking cycle that defines "immediate." Immediate AI oftenresponds to attack requests against high value targets (HVTs) or time-sensitive targets (TSTs).[18] The ASOC usually coordinates and directs immediate AI requests short of the FSCL.

Re-tasking airborne assets should be used when the need for a short reaction time outweighs the reduced effectiveness that may result from incomplete planning. Commanders should ensure the benefits of diverting airpower from a preplanned target outweigh the costs. C2 elements should ensure that aircrews have the most current information about the location of SOF, friendly ground forces, and no-strike target lists to increase situational awareness during operations against unscheduled and unanticipated targets.

When using on-call or dynamically re-tasked assets, immediate AI often relies on an off-board sensor such as an unmanned aircraft system (UAS) 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.

ELEMENTS OF EFFECTIVE AIR INTERDICTION

In addition to the previously discussed elements of counterland operations, planning and execution should include integration with ground maneuver and C2. It also requires accurate and timely ISR, as well as sustained and concentrated pressure on the enemy. The degree to which each element contributes to the operation varies with the nature of the conflict, geographic location, weather, and enemy characteristics.

INTEGRATION WITH GROUND MANEUVER

Planning and conducting AI and ground operations within a coherent and complementary framework enhances their synergy. Additionally, proper integration can create dilemmas for the enemy as they react to the resulting corresponding multi-domain effects of air and ground combat power. Two complementary maneuver schemes serve as an example. The first involves airpower fixing enemy ground forces, thus allowing friendly ground forces to engage with advantage. Airpower can hold enemy ground forces in place, leaving friendly ground forces free to maneuver. If the enemy counters ground maneuver with movement, losses from air attack (due to reduced concealment, greater detectability,

[17] See AFDP 3-52, *Airspace Control, f*or additional information.
[18] For additional information on dynamic targeting and TSTs, see AFDP 3-60, *Targeting*.

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 ground forces. The second scheme involves ground forces fixing enemy forces, thus allowing airpower to engage the enemy more effectively. An actual or threatened ground advance can force an enemy to respond with counter maneuvers or resupply. By placing sustained pressure on the enemy, ground combat increases target acquisition by flushing the enemy from concealment, enabling airpower to destroy enemy forces at a greater rate. **Close coordination among all components maximizes enemy vulnerability to AI.**

Mission-type orders allow for the optimum employment of airpower by maximizing effects and increasing employment flexibility. For example, the JFC may direct theater-wide interdiction of all enemy second-echelon forces using broad guidance. The air component commander 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 land 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 air component commander can determine the best way to achieve those desired effects. Ground commanders requesting supporting AI should clearly state how it will enable or enhance their operations, listing the desired effects and effects to be avoided. The latter might include the consequences of destroying lines of communications 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 the proper use of airpower, can facilitate the commander's intent process by ensuring that ASRs clearly state the desired effects.[19]

ACCURATE, TIMELY INTELLIGENCE, SURVEILLANCE, AND RECONNAISSANCE

Accurate, timely, and relevant intelligence about the enemy's support characteristics, force structure, and ability to adapt is imperative for successful AI. Intelligence provides information about the enemy's probable course(s) of action, identifies interrelated target systems, allows the air component commander 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. To accomplish this, commanders require information systems that facilitate the exploitation and dissemination of real-time and near-real-time intelligence. Such intelligence is beneficial in dealing with targets that may have immediate effects on ground forces or whose location was not accurately known. AI targets should be identified and prioritized in achievement of JFC objectives.

[19] For additional information on ASRs, see JP 3-09, *Joint Fire Support*.

SUSTAINED AND CONCENTRATED PRESSURE

AI demands sustained, persistent action. Success or failure often comes down to the balance between the enemy's ability to repair damage versus the friendly ability to inflict more damage. Eventually, resourceful enemies may circumvent even the most prolonged effects of air attack. Effective employment of ISR assets provides critical information to the air component commander on the results of attacks and on the effects achieved over time by air operations as a whole.

Sustaining Effects

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

Such information should be used in re-attack decisions and follow-on targets. Pressure should be sufficient to impede enemy efforts to replace or repair affected targets and cause stress on the entire enemy operation. This requirement applies particularly to operations of long duration, such as a conflict with a peer or near-peer adversary, because time normally allows the enemy to restore losses. Attacks on key repair and replacement assets may be advisable if such targets represent a critical vulnerability in the enemy's support infrastructure. Concentrating the effects of counterland operations against critical targets is essential to achieve economy of force.

CHAPTER 4: CLOSE AIR SUPPORT

CAS involves employing ordnance within close proximity of friendly ground troops and requires detailed integration with the fire and movement of those forces to prevent friendly fire incidents. These two characteristics distinguish CAS from other types of air warfare.

- **Close proximity.** Close proximity does not represent a specific distance, but is situational and may vary due to physical proximity of forces (friendly and enemy), fires to be employed, or the relative movement of the forces involved.
- **Detailed integration.** The requirement for detailed integration is the determining factor for CAS. Detailed integration describes a level of terminal attack control (i.e., the authority to control the maneuver of, and grant weapon release clearance to, attacking aircraft.) required to achieve desired effects while minimizing the risk of friendly fire from either surface fires or air-delivered weapons.

The JFC establishes the guidelines and priorities for CAS in the concept of operations, operation plan, campaign plan, or air apportionment decision, and by making capabilities and forces available to the components.[20]

The JFACC is given the authority to accomplish CAS missions JFC. These responsibilities normally include recommending air apportionment, allocating forces made available for tasking (including elements of the TACS), creating and executing the ATO, and other actions associated with CAS execution. In addition, the JFACC maintains close coordination with other component commanders to ensure CAS requirements are being met in accordance with JFC guidance.

CLOSE AIR SUPPORT FUNDAMENTALS

CAS provides firepower in offensive and defensive operations to destroy, disrupt, suppress, fix, harass, neutralize, or delay enemy targets in close proximity to friendly forces as an element of joint fire support.[21] The speed, range, and maneuverability of airpower allow CAS assets to attack targets to support the ground scheme of maneuver. In instances of air superiority, CAS can be conducted at any place and time friendly forces are close to enemy forces and may be the best means to exploit tactical opportunities.

Although CAS rarely achieves operational objectives in isolation, it may sometimes be the more critical mission due to a decisive contribution to a specific operation or battle. CAS should be planned to set conditions for success or exploit successful attacks of ground forces. It can halt enemy attacks, help create breakthroughs, destroy targets of opportunity, cover retreats, and guard flanks. CAS should be used at decisive points in a battle and should normally be massed to apply concentrated combat power and saturate defenses. TACS elements should be in place to enable terminal attack control in response to rapidly changing tactical circumstances.

[20] For additional information on JFC operations and campaigns, see JP 3-0, *Joint Campaigns and Operations*.
[21] See JP 3-09, *Joint Fire Support,* for additional information.

CAS requires a significant level of coordination between air and ground forces to produce desired effects, avoid excessive collateral damage, and prevent friendly fire incidents. The fluidity of the ground situation usually requires real-time direction from a joint terminal attack controller (JTAC) to ensure the ground commander's highest priority targets are struck. When the risk to friendly forces is increased, more restrictive terminal attack control measures may be used to integrate CAS with ground maneuvers and joint fires. Thus, Airmen should consider three key factors when employing CAS: the need for flexible, real-time targeting guidance, the avoidance of friendly fire situations, and compliance with rules of engagement (ROE) and the law of war.

CLOSE AIR SUPPORT OBJECTIVES

When it is necessary to provide troops in contact with supporting fires, 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.[22] Ground commanders should use CAS only if it is the most appropriate fire support asset available. In many cases, a ground commander’s organic fires may be the best option to achieve tactical objectives. When planned and integrated well, CAS serves as a force multiplier that achieves effects that can be exploited by the ground commander. CAS should be employed against targets of immediate concern to ground forces when those forces cannot produce the desired effect with organic fires, when ground forces lack organic heavy weapons support, or when the disposition of targets prevents successful attack by surface firepower. Ultimately, CAS should be weighed against other, more effective, uses for CAS-capable assets such as AI or strategic attack. CAS objectives may facilitate ground action; induce shock, disruption, and disorder; and support stabilization activities.

FACILITATE GROUND ACTION

CAS enhances opportunities for ground commanders to seize the initiative through offensive action. CAS can facilitate the offensive by delivering a wide range of weapons, creating break-through opportunities, protecting the flanks of a penetration, or preventing enemy counter maneuver. In the defensive, CAS can be employed to blunt an enemy offensive protect ground forces' maneuver and retrograde, protect rear area movements, or create avenues of escape.

INDUCE SHOCK, DISRUPTION, AND DISORDER.

CAS should be massed to apply concentrated firepower to create immediate physical and psychological effects on the enemy. CAS leverages the inherent speed, range and maneuverability of aircraft to strike the enemy swiftly, unexpectedly and decisively in concert with the movement and maneuver of ground forces. Such coordinated action can quickly overwhelm enemy defenses, deny sanctuary to enemy forces, rapidly degrade

[22] For additional information on integration with surface fire support, see JP 3-09, *Joint Fire Support.*

enemy combat power, disrupt enemy C2, and produce tactical and operational paralysis resulting in the culmination of enemy action.

SUPPORT STABILIZATION ACTIVITIES

Stabilization activities commonly occur during a campaign where operations transition from large-scale combat to stabilization and enabling civil authority. However, they can occur at any time, even when LSCO are still conducted in other AOs or other parts of the JOA. During stabilization, concerns about collateral damage and civilian casualties may limit the types of weapons employed while necessitating more stringent joint fires ROE and clearance requirements. In support of stabilization activities, CAS should be responsive to immediate requests over potentially large AOs where simultaneous presentation of small targets over a widely dispersed area is a likely scenario. During stabilization, ground forces will typically be more lightly armed and lack organic heavy fire support resources. In these instances, CAS may be the only fire support available to ground units and timely response is critical. Finally, CAS in support of stabilization activities may be complicated by the presence of multiple supported commanders in the same AO requesting CAS for troops in contact or to service high value targets. In such cases, the owning ground commander establishes priorities, effects and timing of all fires within the AO (including CAS), and TACS elements coordinate CAS operations in accordance with the air operations directive to prevent CAS conflicts.

CLOSE AIR SUPPORT EFFECTS

CAS delivers fires 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 in support of the ground force commander's objectives and scheme of maneuver. Almost any enemy force near friendly forces on the battlefield is suitable for CAS targeting, but indiscriminate CAS employment against targets decreases mission effectiveness, increases the risk of friendly fire, and dilutes the ability of CAS to achieve decisive effects. Although there is no single category of targets most suitable for CAS application, mobile targets and enemy indirect fire platforms (in general) present an immediate threat to friendly ground forces and are prime candidates for consideration. Enemy short-range surface-to-air threats and electronic warfare platforms should also be considered since their suppression or destruction reduces risk to ground forces' organic rotary-wing and UAS assets. Properly employed CAS can produce counter-force and counter-maneuver effects.

- **Counter-force.** Properly coordinated and employed CAS delivers kinetic effects against enemy forces that renders them ineffective or unusable temporarily (suppression), functionally (neutralization), or permanently (destruction). These counter-force effects are best achieved when CAS assets are massed and employed against deliberately selected target sets or weapon systems to deny their use to the enemy. CAS aircrews and terminal attack controllers must have the knowledge and experience to match appropriate CAS platforms and weapons to selected targets to achieve desired effects in dynamic combat environments.

- **Counter-maneuver.** CAS counter-maneuver effects serve to enhance the ground commander's scheme of maneuver by denying freedom of movement to the enemy. CAS causes disruption by complicating or impeding enemy movement and forcing the enemy to prematurely culminate. CAS can also create delay by temporarily halting or decelerating enemy movement in such applications as covering a friendly ground force retrograde action. In the offensive, CAS can fix enemy forces by preventing their movement or retrograde. Counter-maneuver CAS requires detailed planning and coordination with the ground force commander to ensure CAS-delivered effects are appropriately timed and targeted to enable immediate exploitation by the ground force.

CAS's success during offensive and defensive operations in contiguous, linear warfare may depend on massing effects at decisive points. During large-scale ground operations, there are often more requests for CAS than can be serviced by available air assets. The centralized C2 of CAS employment is essential to allow the massing of its effects where needed most. Ground commanders should properly prioritize and focus the firepower of apportioned and allocated CAS at decisive places and times to achieve their objectives.

TYPES OF CLOSE AIR SUPPORT REQUESTS AND MISSIONS

CLOSE AIR SUPPORT REQUESTS

Preplanned Requests for CAS. CAS requirements foreseen early enough to be included in JFACC planning and allocation (i.e.: early enough to be included in the ATO planning cycle) are submitted by the components' TAGS elements (e.g., Army AAGS, Marine MACCS, etc.) to the JFACC as preplanned Joint Tactical Air Strike Requests (JTAR, DD Form 1972) for CAS. These missions are scheduled on the ATO for a particular target or area, time on target, and a weapons load specifically tailored to match the desired effects specified in the request. Preplanned requests for CAS result in one of two types of missions: scheduled or on-call (discussed below).

Immediate Requests for CAS. Immediate requests for CAS are requests that were not included during planning cycles and do not appear on the ATO. In most cases, the ATO will include assets dedicated to service immediate CAS requests. In other cases, immediate requests may result from unanticipated or emergent needs on the battlefield, which require diverting, rescheduling, or dynamically re-tasking aircraft from other missions. Without the benefit of thorough planning, immediate requests may increase the risk of friendly fire or collateral damage. Immediate requests can be filled with ground or airborne alert CAS, or by diverting aircraft from other missions that are of lower priority.[23]

There are several factors to consider before diverting aircraft for immediate CAS requests. First, the aircrew should be CAS qualified. Extensive familiarity with CAS procedures is required to destroy targets, minimize collateral damage, and avoid friendly fire. Second, suitable mission materials should be available, such as maps, code words, and communications gear. Finally, aircraft diverted for immediate CAS requests should

[23] For additional information on requesting CAS, see JP 3-09.3, *Joint Close Air Support*.

have appropriate ordnance. Fusing and weapons effects are critical factors when attacking CAS targets in environments where avoiding collateral damage is necessary.

CLOSE AIR SUPPORT MISSIONS

Scheduled CAS. Scheduled CAS missions are requested by the land component and include detailed planning, coordination, and preparatory actions between the components at various echelons at the tactical and operational levels. Scheduled CAS missions appear on the ATO and airspace control order (ACO) and normally have a specific contact point and time to expect handoff to a JTAC or a FAC(A). Scheduled CAS missions normally have better intelligence on the type of target resulting in a better munitions-to-target match. Although joint doctrine states that a specific target must be identified when requesting scheduled CAS, dynamic operational environments complicates the task of identifying CAS targets days in advance.

On-call CAS. On-call CAS involves aircraft on ground-based or airborne alert (often listed as GCAS [ground-based alert] or XCAS [airborne alert] in the ATO) during a period when the need for CAS is likely, but not guaranteed. During periods of increased demand for counterland resources, on-call CAS may be impractical. Where possible, on-call CAS assets should be organized and scheduled in accordance with the “Push CAS” and “Pull CAS” framework discussed below.

In a situation in which the air component knows the JFC has placed 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. Planners should assess how much push CAS to use based on JFC priorities, available assets, existing targets, and the ground scheme of maneuver.

- **Push CAS.** Push CAS is a proactive method of CAS that differs from the request-driven scheduled CAS method. Push CAS provides airborne CAS assets to the ground commander at an air contact point awaiting tasking. While similar to scheduled CAS missions, push CAS differs because it is planned and flown absent a JTAR from the supported ground component. CAS missions are “pushed” forward to the ASOC, DASC, FAC(A), or JTAC before the CAS request is made. Push CAS is best suited for target-dense environments where assets not needed for CAS can be pushed to backup targets to avoid wasting sorties. Push CAS cuts response times but requires a high number of sorties so the advantages should be weighed against the other priorities (such as interdicting known targets).

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 US Army Air Force and Great Britain's Royal Air Force 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.

- **Pull CAS.** Pull CAS has the aircraft on ground alert, awaiting a CAS request before launch. CAS missions are "pulled" from ground alert after a CAS request is made. Pull CAS is best suited for environments where few CAS targets are available, so that sorties are not launched until targets are found. For pull CAS to be most effective, the ASOC should be delegated launch and divert authority by the AOC.

ELEMENTS OF EFFECTIVE CLOSE AIR SUPPORT

Effective CAS requires proper training, proficiency, equipment, and an understanding of the strengths and limitations of airpower. In addition to air superiority, appropriate munitions, and a favorable environment, the following factors are crucial to effective CAS.

PLANNING AND INTEGRATION

Effective CAS relies on thorough planning and detailed integration of airpower with ground operations that enables CAS fires to mass at decisive points to achieve the ground commander's objectives. For scheduled or on-call CAS missions, planning and integration begins with a request for CAS submitted to the AOC via the AAGS and continues through the joint air tasking cycle. Unit of action (e.g., Wing, Air Task Force) ground liaison officers and detachments (GLO/GLD) coordinate with their parent battlefield coordination detachment (BCD) at the AOC and with units requesting CAS to prepare aircrews for pre-planned CAS missions to maximize efficiency and effectiveness. 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 C2 agencies such as the ASOC and DASC.[24]

[24] For additional information on the BCD, see JP 3-09.3, *Joint Close Air Support*.

INTEGRATED C2 INFRASTRUCTURE

CAS requires an integrated, flexible C2 structure to plan, coordinate, allocate, manage, synchronize, and employ air assets in support of ground force objectives while maintaining centralized command of theater air assets. Accordingly, C2 requires reliable and interoperable communications among all involved forces. ACMs and FSCMs should allow for timely employment of CAS without adversely affecting other fire support assets.

Flexible and responsive C2 permits requests for CAS to originate at any level of command within the supported ground force or by elements of the TACP, such as ALOs and JTACs. Prompt CAS response times allow commanders to exploit fleeting battlefield opportunities, so the interval between a unit's request for support and the delivery of the supporting attack is a critical factor in CAS effectiveness. The JFACC may delegate certain authorities (such as on-call CAS launch and CAS divert authorities) for CAS to the ASOC to facilitate efficiency and effectiveness. Effective C2 also enhances the ability to integrate CAS with ground operations, coordinate support, and update or warn of threats to CAS assets. The depth at which the ASOC controls operations depends on the ability to communicate with forces and maintain situational awareness of targets, threats, and other factors. The authority to redirect aircraft to or from missions beyond the FSCL should remain centralized at the AOC. In contrast, the authority to flow CAS assets to and from targets short of the FSCL is often delegated to the ASOC or TACP.

Since CAS operates near friendly ground units, reliable communications are crucial to supporting JTACs as they provide targeting instructions, final attack clearance, and friendly fire avoidance instructions to CAS aircraft. 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 procedures are used to prevent friendly fire incidents, specific communications procedures and training are required for air and ground terminal attack controllers and CAS aircrew.[25]

CAS requires interoperable communications amongst all involved forces. Mismatched equipment slows the coordination of fire support and a lack of secure or frequency-agile radios may lead to compromised, garbled, or a complete absence of communicated mission data. Also, errors (such as the air and land components operating with different codes or frequencies for their communications equipment) can delay or preclude CAS.

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 friendly fire, minimizes collateral damage, facilitates TAC, and can greatly increase the accuracy of CAS attacks. When commanders or planners foresee a shortfall in the ability to mark for CAS, they should request that capability during planning. Marking can identify both friendly and enemy positions in addition to being overt or clandestine.

[25] For additional information on standard procedures and terminology, see JP 3-09.3, *Joint Close Air Support,* and AFTTP 3-2.6, *MTTP for the Joint Application of Firepower.*

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

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. JTACs should be aware of the risk of highlighting their position to the enemy regardless of the marking technique employed.

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 should also be flexible enough to change targets, tactics, or weapons rapidly. 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 sites near the AO.
- Placing aircrews in a designated ground or airborne alert status.
- Delegating launch and divert authority to subordinate units.
- Positioning JTACs and TACP elements to facilitate continuous coordination with ground units, communication with aircraft, and observation of enemy locations.

Flexible and responsive procedures are critical for the effective employment of CAS. The ASOC centrally controls the tactical employment and decentralized execution of CAS at the tactical level. Launch and divert authority of scheduled CAS assets at the ASOC or airborne controlling agency reduces response times. 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 ground operations, coordinate support, and update or warn of threats to CAS assets.

The ASOC operates the Joint Air Request Net (JARN) to receive CAS requests from the TACPs supporting the ground commanders. The JARN permits TACPs at each level of command to review the CAS requests as they are provided 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 prioritized for action by the ASOC. Ground commanders at each level should prioritize where and when to employ limited CAS assets 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, SOF may set up unique procedures with the ASOC or AOC to facilitate requests for CAS.

CHAPTER 5: PLANNING COUNTERLAND OPERATIONS

Planning for counterland operations includes a myriad of considerations from munitions requirements to air refueling concerns to specific nuances when operating in an urban environment. Planners should understand the geometry of the battlespace to better integrate counterland operations with land component fires. Also, the mission type designations and derivative missions associated with counterland operations must be fully understood to properly plan future missions.

PLANNING CONSIDERATIONS FOR COUNTERLAND OPERATIONS

Both AI and CAS operations require a wide variety 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, fuel, and maintenance support for critical spares. A robust air mobility capability, especially for intratheater movement, is critical for getting logistical support to the required locations. As an expeditionary force, these key support issues assume even greater importance.

AIR REFUELING CONSIDERATIONS

Tanker aircraft are a force multiplier that increases the effectiveness of counterland operations. Air refueling (AR) operations enable the initial deployment of assets to the theater and provide access to a wider range of targets and payloads. On-station times increase for AI and CAS missions, while decreasing response times and increasing effects on the enemy. AR has become such an integrated part of counterland force packaging that it would be difficult to imagine operating without its enhanced capabilities. For example, enemy anti-ship defenses may force an aircraft carrier to stand off from the counterland area, requiring USAF 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, AR may be the only way to get counterland missions to the fight from protected bases further to the rear.

One of the key tasks for ATO production teams is optimizing available tankers. The availability of refueling booms and drogues is often the limiting factor in determining how many counterland targets can be attacked within 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.[26]

TARGETING PROCESS CONSIDERATIONS

Targeting is the process of selecting and prioritizing targets and matching the appropriate response to them, considering operational requirements and capabilities.[27] The purpose of the joint targeting process is to create desired effects in the operational environment (OE) to support achievement of the commanders' objectives through the prioritization,

[26] For more information about air refueling, see AFDP 3-36, *Air Mobility Operations*.
[27] The definition for "targeting" can be found in Joint Publication (JP) 3-0, *Joint Campaigns & Operations.*

integration, synchronization, and application of fires and other capabilities. Targets for counterland operations will flow through the six phases of the joint targeting cycle. [28]

Phase 1: Commander's Objectives, Targeting Guidance, and Intent. Understanding the JFC's objectives, guidance, and intent is paramount for planning counterland operations. Air component planners will establish objectives that meet the JFC's guidance and contribute to the achievement of the desired end state.

Phase 2: Target Development and Prioritization. Target development is the systematic examination of potential target systems and their components, individual targets, and elements of targets to determine the necessary type and duration of an engagement. The purpose of target development is to validate military targets IAW the JFC's objectives, ROE, and the law of war (LOW). Target development analyzes potential target systems to understand where critical linkages and vulnerabilities exist. This step also includes target analysis, target vetting, target validation, target nomination, collection and exploitation requirements, and target list development. Targets for AI are the result of component and JFC target nominations. Targets for CAS, however, are derived via a different method using ASRs. The product of this phase is the JIPTL, a prioritized list of targets approved and maintained by the joint force commander.

Phase 3: Capabilities Analysis. This phase involves evaluating the available capabilities against desired effects to determine appropriate options. Four steps accomplished during this stage are target vulnerability analysis, capabilities analysis, feasibility assessment, and effects estimate. Weaponeering is conducted during the capabilities analysis step.

Weaponeering. Weaponeering is the process of determining the specific means required to create a desired effect on a given target. Weaponeering considers desired effects against the target (both direct weapons effects and indirect desired effects), target vulnerability, delivery accuracy, damage criteria, and weapon reliability. Targeteers quantify the expected results of weapons employment against prioritized targets to produce desired lethal and nonlethal effects.

Weapons effects are always a critical consideration for counterland operations. Munitions and fuses designed for specific applications against certain targets may have little or no capability against other targets. Likewise, the flexibility of some munitions and fuses to provide multiple effects allows options for planners to maximize effects against preplanned targets and can allow inflight selection of weapon and fuse settings for unanticipated targets. The latter capability is especially important for CAS and on-call AI when the specific target type may not be known before takeoff. When possible, combat aircraft should have a variety of munitions to meet operational requirements.

Some targets require additional special care and consideration during attack planning and execution. Examples include leadership targets due to potential political or diplomatic repercussions and targets containing chemical, biological, radiological, and nuclear

[28] For more information about the joint targeting process and the joint targeting cycle, see JP 3-60, *Joint Targeting.* Only phases 1-4 will be discussed in this chapter, since Phase 5: Execution and Phase 6: Assessment occur after the planning process.

(CBRN) agents or materials where an attack could lead to the spread of CBRN contamination.[29]

Allocation. Allocation is the distribution of limited resources among competing requirements for employment. Allocation assigns specific air assets based on the JFC's apportionment guidance and target nominations from Services and components. The allocation process results in the creation of the master air attack plan (MAAP), which is the air component commander's time-phased air scheme of maneuver for a given ATO period and includes matching assets against AI targets.

Phase 4: Commander's Decision and Force Assignment. During this phase, tasking orders are prepared and released to the executing components and forces. The AOC will produce an ATO, ACO, and SPINS to provide operational and tactical levels of detail that units supporting counterland operations can use for mission planning.[30]

Before ATO AI or CAS missions are executed, changes to targets and targeting priorities can be incorporated with justified reasons. Once the ATO is in final production, those changes are typically passed to the AOC's combat operations division for incorporation at tactical unit level planning or during actual mission execution.

If an enemy ground force does move to an unexpected location, it is not likely to have moved far enough to require significant changes to counterland missions. The target for the ATO mission can be moved to the new location. Changes should account for differing air defenses and proximity to friendly ground forces before final approval.

For those missions where lucrative targets are highly likely, but planned targets or locations are not available, airborne (XAI) or ground alert AI (GAI) may be appropriate. XAI can "push" aircraft into a nearer proximity to provide the most rapid response once final targeting guidance comes from off-board sources, airspace control elements representing the AOC, or from the AOC itself. Airborne alert missions should only be planned when lucrative targets are likely to exist, otherwise the missions use resources (fuel and aircraft readiness) that should not be wasted. Alternatively, GAI or "pull" missions, may be used when AI targets are possible, but the fuel expenditure or risk from launching the aircraft does not warrant an airborne alert.

Airborne or ground alert is commonly employed for CAS when there is no preidentified target before mission execution. However, when utilizing the "push" method for AI or CAS, AOC planners may provide preplanned backup targets for CAS and AI missions to give each mission a fixed target of some military value if the primary target fails to materialize.

MUNITIONS REQUIREMENTS

Maintaining proper stocks of precision-guided munitions is critical. Tradeoffs are involved in deciding which weapons to employ against specific targets and availability is often a

[29] For additional information on prioritization and special considerations related to planning and executing attacks on certain targets, see JP 3-60, *Joint Targeting*; for information on countering WMD operations, see JP 3-40, *Countering Weapons of Mass Destruction (WMD)*.
[30] For more information about unit-level planning, see AFTTP 3-3.Integrated Planning & Employment (IPE).

factor. Knowledge of munitions availability and resupply capability is vital. Munitions with higher levels of accuracy, destructiveness, or standoff range are often in short supply.

Planners should consider factors such as the anticipated length of the operation, munitions requirements of the various operations, and tradeoffs of each weapons type when making munitions recommendations. At times, the AOC may allow tactical units to manage weapons selection for CAS missions by placing general guidance in the ATO, such as “best available anti-armor” in the munitions portion of the mission tasking.

MOBILE TARGET CONSIDERATIONS

Planning for mobile targets normally requires a slightly different approach than fixed targets, whether attacking actual enemy combat forces or their fielded support. While intelligence personnel can readily find fixed facility locations, mobile target locations change as they move. This movement requires updates to the location of the mobile target from the initial target nomination through AI execution. Sensors such as moving target indicators can locate and compute accurate bombing solutions for moving vehicles on a battlefield. 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 AOC employs a dynamic targeting cell inside the Combat Operations Division to ensure planning maximizes the effectiveness of counterland attacks on mobile targets and integrates the effort with the ground scheme of maneuver.

Clarifying Dynamic Targeting Terminology

Dynamic targeting is a process, not a mission type. The dynamic targeting process may be used to prosecute targets by various Interdiction mission types, such as SCAR (or, in the Marine Corp, *armed reconnaissance)*, airborne alert or ground alert air interdiction (XINT or GINT), and air interdiction of maritime targets (e.g., air-alert surface combat patrol [XSCP]). Also, preplanned air interdiction and CAS sorties may be re-rolled to strike targets using the dynamic targeting process.

Additionally, “dynamic target” is an improper term and not a type of target. The four doctrinal target types are *scheduled, on-call, unscheduled,* and *unanticipated*.

On-call, unscheduled, and unanticipated targets are prosecuted using the dynamic targeting process. The terms INVESTIGATE, TARGET, and SMACK are both brevity terms and tasking types used to direct aircrew to prosecute the target.

LIAISON CONSIDERATIONS

Before executing AI missions, planners should coordinate with other organizations and components to prevent friendly fire, coordinate airspace usage, minimize collateral damage, and avoid providing a propaganda advantage for the enemy. Extensive coordination is required with the land component and special operations forces to facilitate counterland operations. Each Service and component maintains a liaison at the AOC such as the Army’s BCD, the Marine liaison element (MARLO), and the special

operations liaison element (SOLE) to enable this extensive coordination to occur.[31] In a reciprocal manner, the USAF provides a joint air component coordination element (JACCE) as a liaison to counterpart components. The JACCE provides operational level assessment and coordination of air component planning and execution to ensure integration within the operations plan and operational intent to meet JFC guidance.

If the land component needs an enemy unit attacked, and that unit meets the requisite priority criteria, planners should ensure that particular enemy unit is affected as required. This specificity requires AOC planners to maintain awareness of that enemy unit's position. For land component target nominations against mobile targets, the BCD is responsible for updating the proposed target location. Instead of concern over a particular enemy unit, the land component may have a certain geographic area of concern to its scheme of maneuver. In this case, the friendly ground force requires an attack on any enemy forces that happen to be there. Planning methods should therefore allow for an area or unit-specific focus for AI mobile targeting. AI against enemy ground forces is most effective when prioritized targeting guidance is included in the nomination, such as artillery first, armor second, and so forth. **However, air support can be most effective when the land component specifies desired effects against an enemy unit when possible** (e.g., "delay enemy X Brigade 72 hours from achieving contact" or "fix enemy Y division in place for 48 hours" or "destroy six T-90 main battle tanks from the 123d Tank Regiment to prevent further offensive action").

URBAN CONSIDERATIONS

Joint Urban Operations 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 the related terms of irregular or asymmetric warfare.[32]

While urban environments vary greatly, challenges to counterland operations can be expected in identifying combatants, collateral damage, preservation of infrastructure, restrictive ROE, line-of-sight issues affecting targeting and communications, and freedom of maneuver. C2 of airpower does not change in the urban environment, but tactics, techniques, and procedures may differ vastly from those employed on the open battlefield.

CAS in an urban environment is highly demanding, as locating and identifying friendlies and locating enemy targets is more difficult than in open terrain because of obstructions from multistory structures that hamper both sensor and weapon line of sight. Using overlaying tactical charts, local street maps, and urban grid systems may prove useful in identifying the 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.

[31] For additional information on liaisons, see AFTTP 3-2.17, *MTTP for the Theater Air-Ground System*.
[32] For additional information, see JP 3-06, *Joint Urban Operations*.

Planners should consider that ground operations are largely decentralized due to communication limitations, and coordination may be time-consuming to prevent friendly fire 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.

Collateral damage in cities or towns represents a risk that should be considered and minimized. One real, alleged, or staged collateral damage or friendly fire event can have a strategic impact, negatively affecting ROE, special instructions, and host nation restrictions on operations. Planners should integrate public affairs and information warfare capabilities into counterland operations, from strategy development through mission execution and assessment. Public information planners should be involved early and throughout the process to counter propaganda and misinformation and provide context for successes and mishaps that can enhance trust and support for counterland operations while driving adversary behavior. In addition, the planners should consider how information capabilities, alone and in concert with physical power, can affect adversary behavior to create the commander's desired effects. 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, by their very nature, urban operations involve significant law of war considerations. In particular, commanders and aircrew should determine whether military necessity justifies the operation.

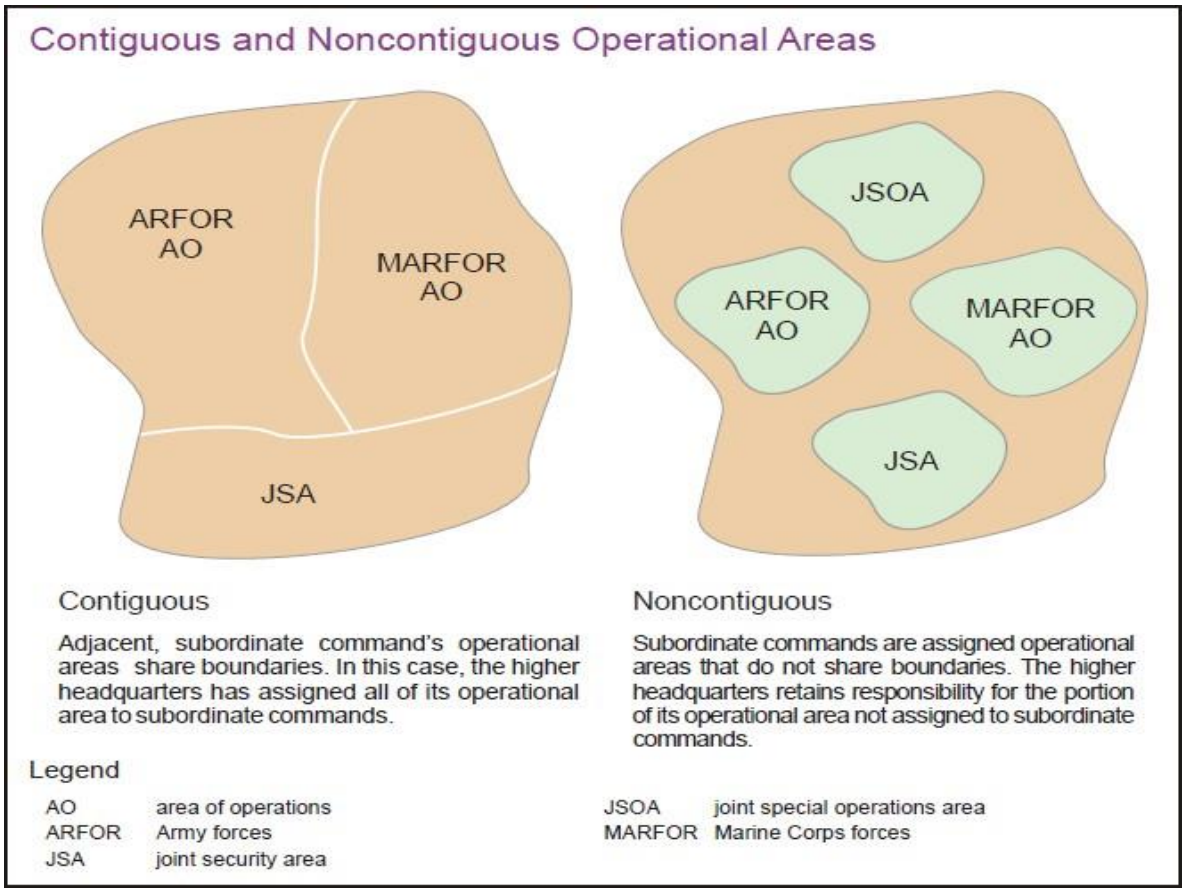
BATTLESPACE GEOMETRY

CAS and AI require flexible, simple, effective, and relevant maneuver control measures (MCMs) and FSCMs.[33] Since counterland operations are normally conducted with friendly ground forces, a mutual understanding of MCMs and FSCMs between air and ground forces must be established. This mutual understanding is to integrate joint fires and avoid friendly fire incidents. MCMs, such as boundaries, are used to establish a common understanding regarding the responsible HQ for a JFC-assigned volume within the theater. FSCMs are then established to enable common understanding by all forces providing fires within that volume of space. The conflict continuum may involve rapidly advancing ground maneuvers or widely distributed ground operations. Either of these approaches require nonlinear FSCMs.

[33] For additional information on MCMs, see JP 3-09, *Joint Fire Support*.

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. Whether contiguous or noncontiguous, boundaries are used to determine AO. Within assigned AOs, the commander assigned to that AO determines the priority, effects, and timing of fires within that AO. A noncontiguous operational area normally is characterized by a 360-degree boundary. The HHQ is responsible for the area between noncontiguous operational areas. The close area is the portion of a commander's AO assigned to the subordinate maneuver forces. Operations in the close area are within a subordinate commander's AO. A deep area is the portion of the commander's AO that is not assigned to subordinate units. Operations in the deep area involve efforts to prevent uncommitted enemy forces from being committed in an organized manner.[34] See the figure below, "Contiguous and Noncontiguous Operational Areas."



Contiguous and Noncontiguous Operational Areas
(Source: JP 3-0)

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 operations along the lines of

[34] For additional information on deep area, see Army Doctrinal Publication (ADP) 3-0, *Operations*.

operations with identified forward lines of own troops (FLOTs). In linear operations, emphasis is placed on maintaining the position of the ground force in relation to other friendly forces. This positioning usually results in contiguous operations where ground forces share boundaries. Linear operations are normally conducted against a deeply arrayed, echeloned enemy force or when the threat to lines of communication reduces a friendly force's freedom of action. In these circumstances, linear operations allow commanders to concentrate and integrate combat power more easily.[35]

In nonlinear operations, forces orient on objectives without geographic reference to adjacent forces. Nonlinear operations typically focus on multiple decisive points and are 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 may rely on airpower to provide operational area awareness, mobility advantages, protection of non-engaged “rear” areas, and freedom of action. Depending on the situation, the JFC may conduct linear or nonlinear offensive and defensive operations in contiguous and noncontiguous areas. Linear contiguous warfare typically characterizes LSCO and campaigns, while stabilization activities are usually nonlinear and non-contiguous.

BOUNDARIES

Various boundaries and coordination measures are used for airspace control and fire support coordination when planning and executing counterland operations. The measures help integrate air and ground maneuver, ensure deconfliction, avoid friendly fire, and identify which parts of the operational area require specialized control procedures. Boundaries define a component’s AO and serve as the limit of an organization's responsibility. Within their designated AOs, component commanders not only integrate and synchronize maneuver and fires, but also designate target priority, effects, and timing of fires.

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, historically the role of cavalry forces. The zone between the FLOT and the FSCL is typically the area over which friendly ground forces intend to maneuver in the near future and is also the area within

[35] For additional information on linear and nonlinear operations, see JP 3-0, *Joint Campaigns and Operations.*

which ground force organic fires are employed. This zone is where air operations are normally executed through the ASOC and subordinate TACP.

Fire Support Coordination Measures (FSCM). 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, free fire areas, and the FSCL. Restrictive measures safeguard friendly forces and include no-fire areas (NFAs), restrictive fire areas, restrictive fire lines, and airspace coordination areas.

When supporting the land component commander, airpower operates within the confines of all JFLCC FSCMs.[36] FSCMs should be clearly defined, easily controlled, and not overly restrictive to reduce the risk of friendly fire and take advantage of airpower's inherent flexibility and versatility.

Fire Support Coordination Line (FSCL). The FSCL is an FSCM established by the land or amphibious force commander to support common objectives within an AO, beyond which all fires must be coordinated with affected commanders prior to engagement and, short of the line, all fires must be coordinated with the establishing commander prior to engagement. The FSCL does not divide an AO by acting as a de facto boundary between close and deep operations or a zone for CAS. However, the air component uses the FSCL to divide sectors of control between the ASOC and AWACS or CRC, with the ASOC's sector of control being beneath the coordinating altitude, from the ground force's rear boundary to the FSCL and AWACS or CRC controlling forward of the FSCL.[37] The FSCL applies to all fires from any domain, using any ammunition. Forces attacking targets beyond an FSCL must inform all affected commanders in sufficient time to allow necessary reactions to avoid friendly fire. This coordination is normally conducted with the AOC via the Service and component liaisons within the AOC who represent the other affected commanders. Supporting elements attacking targets beyond the FSCL should ensure the attack will not produce adverse attacks on or to the rear of the line.

The FSCL is often used as the forward limit of the airspace controlled by the ASOC. This limit mandates the various ASOCs and other TACS components that have the required connectivity to monitor air activity out to the FSCL and monitor friendly and enemy ground positions, surface-to-air threats, and all other key aspects of situational awareness. Likewise, when any component attacks targets beyond the FSCL, it is necessary to coordinate with the other components to ensure deconfliction and prevent multiple assets from attacking the same target. This deconfliction is normally done within the AOC because the AOC is the only headquarters that doctrinally contains liaison elements from all Services, components, and nations involved in the conflict, enabling it to coordinate the desired attack(s) rapidly.

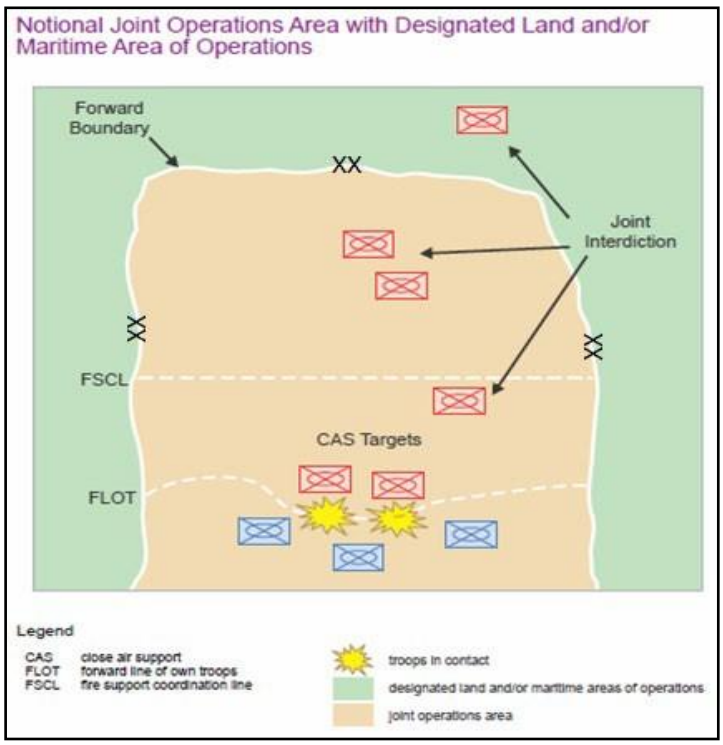
[36] For additional information on the JFLCC, see JP 3-31, *Joint Land Operations*.
[37] For additional information on coordinating altitude, see JP 3-52, *Joint Airspace Control*.

Operation IRAQI FREEDOM FSCMs

As the most recent large-scale combat operation, OIF employed all the existing FSCMs. However, due to the lack of common understanding of usage of FSCMs, the initial FSCL was placed well beyond the range of land fires to accommodate the anticipated rapid movement of land forces into Iraq.

The deep placement of the FSCL reduced the efficiency of airpower by overcomplicating the execution of AI missions. 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 enemy targets. Aircrews were still required to comply with CAS-centric, ASOC C2 procedures short of the FSCL. The time-consuming CAS clearance process (which is doctrinally necessary to avoid potential friendly fire incidents) hindered the expeditious attack of fleeting targets that were 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 optimum placement of the FSCL varies with specific circumstances. Still, typically it should be placed at or near the maximum range of organic artillery, where the ability to create effects on the battlefield shifts from the ground component's organic artillery capabilities 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 shifts as artillery moves, from one operation's phase to the next. FSCL placement should consider the ground scheme of maneuver and should account for the anticipated artillery placement based on the unit rate of march, rather than the current ground force positions when the FSCL will be active. **History has shown that placing the FSCL too deep can be detrimental to overall joint force effectiveness and may even provide the enemy a sanctuary from effective air attack.**



Notional JOA with Designated Land and/or Maritime AOs (Source JP 3-03)

The preponderance of lethal effects shifts from land power 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. Components should plan "on-call FSCLs" to facilitate a rapidly moving battlefield in advance of actual needs 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. However, modern technology has reduced the importance of aligning the FSCL with prominent terrain features to make it easily identifiable from the air. Thus, simply planning to overlay the FSCL on preplanned maneuver phase lines is an optimal way to tie MCM and FSCMs.

Although sometimes thought of as a JFLCC responsibility, FSCL placement should be based on the placement of the division(s') organic artillery's maximum range. This placement ensures all components can integrate and maximize effects in support of JFC objectives and the designated AO owner without creating the enemy sanctuary found during OIF. Joint doctrine does not define a depth or range for placing the FSCL with the FLOT or forward edge of the battle area, as the location of the FSCL should be based on the placement of the cannon artillery rather than the troops permitting the theater commander to tailor FSCL placement according to specific battle conditions that optimize and facilitate joint operations.

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 require oversight from the ASOC because those missions are not in close proximity to friendly forces and, thus, beyond the distance where detailed integration is required. However, CAS missions can be flown in the portions of the operational area beyond the FSCL if friendly troops operate beyond the FSCL and require support. When any component attacks targets beyond the FSCL, it is necessary to coordinate with the AOC and their Service or component liaisons within the AOC to ensure deconfliction and to prevent multiple assets from attacking the same target. Ground forces, such as SOF teams that often operate beyond the FSCL, it is necessary to coordinate with the AOC and their Service or component liaisons within the AOC to ensure deconfliction and to

prevent multiple assets from attacking the same target. Ground forces, such as SOF teams that often operate beyond the FSCL, should coordinate their locations with the appropriate TACS element for TAC and have contact with a SOLE at the AOC. Short of the FSCL, all missions typically require check-in with the ASOC while en route to the target area for an update on potential targets, surface-to-air threats, and friendly troop locations. All air component short-of-the-FSCL missions, even those that do not directly support the ground component, such as counterair or strategic attack, normally contact the ASOC for situation updates and deconfliction while in the ASOC's airspace.

The Battlefield Coordination Line

In some scenarios, such as the land component's AO during Operation IRAQI FREEDOM, the JFC may elect to place the FSCL well beyond the effective range of Marine Corps organic artillery. This effectively creates a sanctuary for enemy forces between the maximum range of Marine Corps artillery and the FSCL. Enemy forces in this area are too far from Marine Corps artillery to be affected by surface-to-surface fires and are also too far for Marine Corps TACP to observe and conduct the necessary additional coordination required for air to surface fires short of the FSCL. To eliminate this sanctuary, a MAGTF commander may elect to establish a battlefield coordination line (BCL).

The BCL is an exclusive Marine Corps FSCM, similar to an FSCL, which facilitates the expeditious attack of targets with surface indirect fires and aviation fires between this measure and the FSCL. When established, the primary purpose is to allow Marine aviation to attack surface targets without the approval of the ground force element commander in which the targets may be located. To facilitate air-delivered fires and deconflict air and surface fires, and ACA will always overlie the area between the BCL and the FSCL. Unlike the FSCL, the BCL is used by the Marine Corps to help delineate CAS and *deep air support*, a Marine Corps term that includes AI procedures. 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 supplemental FSCM allows counterland airpower to attack ground targets beyond the BCL using minimal coordination procedures with ground forces.

Kill Box. A kill box is a three-dimensional FSCM, normally built through the combined use of an FSCM (for the ground) and an ACM (for the air), used to facilitate the integration of fires. A kill box is a measure, not a mission. Kill boxes are established to support interdiction efforts as part of the JFC's joint targeting process. Kill boxes allow lethal attacks against surface targets without further coordination with the establishing commander and without the requirement for TAC. Kill boxes are established by commanders in coordination with the airspace control authority for that AO, and kill boxes are published on the airspace control order released by the AOC. Kill boxes are designated as either a blue kill box (air-surface fires only) or a purple kill box (joint fires enabled: air-surface, surface-surface, and subsurface-surface fires are all approved). The kill box fires status (HOT or COLD) and airspace status (OPEN or CLOSED) is also designated on the ACO. Kill boxes should be designated by the Global Area Reference

System (GARS). The kill box should have appropriate restrictions when integrated into air-to-surface and subsurface- or surface-to-surface indirect fires. These restrictions provide a three-dimensional block of airspace in which participating aircraft are deconflicted from friendly surface fires. The restrictive measures also prevent nonparticipating aircraft and maneuver forces from entering the kill box. The objective is to reduce the coordination required to fulfill support requirements with maximum flexibility (permissive attributes) while preventing friendly fire incidents (restrictive attributes). ROE and law of war targeting constraints still apply to fires executed in a kill box, the designation of a kill box is not an authorization to fire indiscriminately into the area. A kill box may contain other measures within its boundaries (e.g., NFAs, restricted operating zones, and airspace coordination areas. Restrictive FSCMs (those FSCMs established to safeguard friendly forces) always have priority over the permissive FSCM (established to facilitate killing a target) when established within a kill box.[38]

MISSION TYPE DESIGNATIONS

Counterland missions are either scheduled or on-call. Scheduled missions result from preplanned requests during the normal air tasking cycle and allow for detailed coordination between the tactical units. Preplanned requests may result in sorties in an on-call status (either airborne or ground alert) to cover periods of expected enemy action, respond to immediate requests, or attack emerging targets. Scheduled AI missions use detailed intelligence to attack known or anticipated targets in an operational area to generate effects that achieve the JFC objectives. Scheduled CAS missions are normally provided to a specific ground unit or operation.

With the appropriate commander's approval, scheduled AI or CAS missions can be re-tasked to provide CAS or attack TST via the dynamic targeting process. Threats, aircrew qualifications, weapons load, and weapons fusing should be considered when re-tasking missions. Commanders and planners should consider balancing the efficiency and effectiveness of keeping a portion of air assets in reserve when identifying airborne and ground alert missions. Immediate requests may result from situations that develop after the suspense for preplanned requests in a particular ATO period. The dynamic targeting process provides a responsive use of on-call or dynamically re-tasked counterland missions to exploit an enemy vulnerability that may be of limited duration. However, dynamic targeting may not result in success due to reduced mission preparation and target study time.[39]

The following are types of counterland missions:

- **Air Interdiction (AI).** AI is a mission scheduled to strike particular targets in response to JFC or component target nominations.
- **Ground-based Alert AI (GAI).** GAI is the term used to identify an on-call mission placed on ground alert to provide responsive AI throughout the theater in response to emerging targets.

[38] For more information on kill boxes, see AFTTP 3-2.59, *MTTP for Kill Box Planning and Employment*.
[39] For more information on the dynamic targeting process, see AFTTP 3-2.3, *MTTP for Dynamic Targeting.*

- **Airborne AI (XAI).** XAI is the term used to identify an airborne alert AI mission tasked for on-call targets that may be re-tasked during execution for targets of opportunity. Also referred to as armed reconnaissance (AR).

  Note: While XAI (or AR) and GAI are the primary alert AI missions, these nomenclatures are not compatible with the theater battle management core system (TBMCS) at the time this publication was developed and will not display as such on the ATO. Currently, AR in TBMCS stands for air refueling. Alert interdiction (XINT and GINT) is the mission type that is compatible with TMBCS and is most reflective of XAI and GAI. Planners and operational units are responsible for understanding this TBMCS deficiency and must coordinate appropriately.

- **Strike Coordination and Reconnaissance (SCAR).** SCAR is a mission flown for the purpose of detecting targets and coordinating or performing interdiction or reconnaissance on those targets.

- **Close Air Support (CAS).** CAS is a mission scheduled to provide air support to preplanned CAS requests.

- **Ground-based Alert CAS (GCAS).** GCAS is the term used to identify an on-call mission placed on ground alert status to provide responsive air support to ground forces. CAS assets close to the supported ground forces typically provide faster response times. GCAS missions may be changed to Airborne Alert CAS (XCAS) as the situation dictates.

- **Airborne Alert CAS (XCAS).** XCAS is the 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 shift to an AI role to service other targets.

  NOTE: When “X” prefix missions are scheduled to provide flexible or continuous airborne presence, the effort constitutes a persistent air mission. XAI missions are designed to provide persistent reconnaissance or persistent attack, on-call airpower where targeting is expected to be highly dynamic or unpredictable. High endurance UAS have inherent advantages when executing this approach. However, building persistence into ATO-assigned missions is not bound to a specific aircraft type. Planning for a persistent combination of surveillance, kinetic, and non-kinetic actions is the underlying function of any ATO. Dominance in the air translates into key effects in the land domain and provides integration points for cross-domain access. Further, the ability to continuously create effects at a position or defined area for long durations can enable cross-domain capabilities.

Command Relationships and Mission Types

The collaborative air planning tool, theater battle management core system (TBMCS), uses "mission type" descriptors for missions ranging from direct support of ground forces to the independent application of airpower supporting JFC objectives in the absence of ground forces. Descriptors and their prefixes are not linked to command relationships. An XAI mission using SOF as a sensor could quickly evolve into a CAS mission if the SOF unit becomes compromised. In this case, airpower supported by SOF becomes SOF supported by airpower, and the planned TBMCS mission type is irrelevant.

Some theaters of operation may use nondoctrinal mission taskings such as "armed overwatch." These specific applications of CAS or AI should not be confused as a new counterland mission category. For example, during counterinsurgency (COIN) operations in Iraq and Afghanistan, ground commanders relied heavily on aircraft conducting "armed overwatch" missions to provide full-motion video supporting the ground commander's scheme of maneuver.[40] Armed overwatch provided critical situational awareness and immediate CAS in the dynamic COIN environment when necessary. CAS should be considered if an operation requires an "armed" portion of the mission, to include a show of force, in support of the affected ground force using CAS procedures.[41] Armed overwatch should not be considered a new or independent counterland mission area distinct from CAS. Commanders may develop specific procedures in addition to CAS procedures if required for the "overwatch" portion of the mission.

Other unique counterland missions include the generic term "attack" for missions that do not meet AI definitions and strategic attack for missions that fall under a different operational function than counterland.[42]

DERIVATIVE MISSIONS ASSOCIATED WITH COUNTERLAND

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 CAS and AI.

Forward Air Controller (Airborne). FAC(A) missions provide TAC for CAS aircraft operating in close proximity to friendly ground forces. Due to the risk of friendly fire, FAC(A)s are specifically 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 beyond the visual range of friendly ground forces. Only specially trained and certified aircrews are authorized to perform FAC(A) duties, as they require detailed knowledge of friendly and target locations, artillery operations, available aircraft weapons and fuel states, the ability to

[40] See JP 3-24, *Counterinsurgency,* for additional information.
[41] For additional information on show of force, see JP 3-09.3, *Joint Close Air Support*.
[42] See AFDP 3-70, *Strategic Attack, f*or additional information.

conduct all types of TAC, and the flexibility to prioritize and adjust in a dynamic environment. FAC(A) tasks, duties, and land maneuver commander clearance should be identified in planning prior to execution to not delay CAS operations. 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 TAC(A), and may provide identification, collateral damage estimation, and immediate BDA.

Tactical Air Coordinator (Airborne) (TAC[A]). TAC(A) missions provide communications relay between the TACP and attack aircraft, as well as other agencies of the TACS, in the absence of a FAC(A). In high threat environments, USAF two-aircraft FAC(A) flights may divide responsibilities so one aircraft fills the normal FAC(A) role and the second becomes a TAC(A). This TAC(A) expedites CAS aircraft-to-JTAC handoff during “heavy traffic” CAS. 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 including naval surface fire support and assisting SCAR mission.

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 ground units have relocated because of ground fighting.

SCAR missions usually are part of the C2 interface to coordinate multiple flights, detect and strike targets, neutralize enemy air defenses, and provide battle-damage assessment (BDA). SCAR aircrew perform a similar function for AI missions that FAC(A) provides 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 are trained to coordinate SCAR missions. Platforms like 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 are best performed by an AWACS or a CRC.

SCAR aircrew do not have TAC authority to conduct CAS even though some SCAR responsibilities are similar to those of a FAC(A). FAC(A) undergo specialized training to effectively coordinate and integrate air-ground forces to conduct TAC safely during CAS. A FAC(A)-qualified pilot can conduct SCAR, but a SCAR pilot without FAC(A) qualification cannot conduct FAC(A) duties. Planners and commanders should understand this important nuance when tasking XAI or armed reconnaissance missions or diverting

airborne aircraft to an immediate CAS request since the AI aircrew may not be CAS qualified.[43]

[43] For additional information about SCAR, see JP 3-03, *Joint Interdiction,* and AFTTP 3-2.72, *MTTP for Strike Coordination and Reconnaissance (SCAR)*.

CHAPTER 6: EXECUTION OF COUNTERLAND OPERATIONS

Successful execution of counterland operations entails careful planning, precise coordination, and effective communication between air and ground forces. When executed effectively, CAS and AI can provide decisive advantage on the battlefield by enabling friendly ground forces to maneuver more freely, disrupting enemy operations, and contributing to the JFC's objectives and end state. Specific considerations for counterland execution entail detailed integration and weapons release authority, types of terminal attack control, and the avoidance of friendly fire and collateral damage.

DETAILED INTEGRATION AND RELEASE AUTHORITY

A key difference between AI and CAS is the requirement for detailed integration to prevent friendly fire incidents. Detailed integration may not be required when targets are not in close proximity to friendly forces because the possibility of friendly fire is lower. Since AI should not require detailed integration to prevent friendly fire, aircrew employ munitions according to the ROE and target identification standards outlined in theater guidance without requiring additional clearance.

AI Release Authority. AI release authority is normally delegated to the aircrew conducting the mission. Beyond the FSCL, this delegation would come from the air component commander via the ATO or an authorized element of the TACS. For AI release authority short of the FSCL, where the maneuver of friendly forces is anticipated, (e.g., within an FSCM such as a kill box), the ASOC normally coordinates with the Army echelon being supported (normally the Fires Cell or other Army elements) that can provide friendly force tracking, before allowing AI missions to continue "as fragged." Although AI release authority is delegated to the aircrew, this does not preclude other airborne or ground-based entities from providing off-board target cueing or TGO.[44]

CAS Release Authority. Conversely, CAS requires detailed integration because friendly forces are in close proximity to the engagement. The ground commander is the release authority within the AO. The ground commander can delegate this release authority to personnel trained as JTACs in direct support of their element, which provide clearance to CAS aircraft. Release authority is typically not delegated to the aircrew, with the possible exception of a FAC(A).

KILL BOX OPERATIONS

Aircraft can be tasked to conduct AI missions in a designated kill box via the ATO. The ATO designates the aircraft's working airspace with a reference to the kill box location listed in the ACO. Aircraft cleared by TACS elements to enter the kill box area are also inherently delegated weapons release authority inside that kill box in accordance with AO special instructions (SPINS)/ROE.

The ATO may also designate an aircraft to be the kill box coordinator (KBC). The KBC is responsible for the deconfliction of aircraft within the kill box airspace and clearance into

[44] For additional information on SCAR, see JP 3-03, *Joint Interdiction,* and AFTTP 3-2.72, *MTTP for SCAR*.

and out of the kill box. Ideally, an aircraft with a trained SCAR aircrew is designated to be the KBC for a kill box. SCAR qualified aircrew can direct multiple other AI missions to find, fix, and engage targets within the kill box.

C2 in these situations is conducted through the TACS. For kill boxes and the resulting AI or SCAR missions that are short of the FSCL, the air component's AI or SCAR missions check in with the ASOC. The ASOC is normally the airspace control element of the TACS, responsible for all air component operations short of the FSCL, including, but not limited to, CAS and AI. The AOC maintains responsibility for the airspace control of those air component missions beyond the FSCL via airborne or ground-based TACS elements.

TERMINAL ATTACK CONTROL

Flexible real-time targeting guidance, collateral damage minimization, and friendly fire avoidance are critical considerations when conducting CAS. To integrate air-ground operations safely and effectively, either a JTAC or a FAC(A) provides TAC for CAS missions. TAC is defined as the authority to control the maneuver of and grant weapons release clearance to attacking aircraft. Current and qualified JTACs and FAC(A)s should be recognized across the DoD as capable and authorized to perform TAC.

TYPES OF TERMINAL ATTACK CONTROL

The three types of TAC are designated as Type 1, 2, or 3. **Only a JTAC or FAC(A) can provide Types 1-3 TAC.** Each type of TAC offers the JTAC/FAC(A) different levels of risk mitigation based on the aircraft type, weapon to be employed, and the tactical situation on the ground. The ground commander considers the situation and issues guidance to the JTAC based on the associated risks identified in the tactical risk assessment.[45] The intent of this guidance is to offer the lowest level supported commander the latitude to determine which type of TAC best accomplishes the mission. The risk level is not directly tied to a given type of TAC and the three types of control are not ordnance specific.

The tactical situation defines the risk level. For example, Global Positioning System (GPS) and digital targeting systems used in Type 2 control may mitigate risk better than using nonguided, free-fall munitions under Type 1 control. It is essential to understand the most important risk mitigation tool is target verification before an 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 observing the attack aircraft's nose position.

CLOSE AIR SUPPORT EXECUTION WITH NON-JOINT TERMINAL ATTACK CONTROLLER PERSONNEL

In certain circumstances, the ground commander might require air support when a JTAC or FAC(A) is not available or is no longer able to assist. Aircrews executing CAS under these circumstances bear increased responsibility for the detailed integration and

[45] For additional information on types of control and tactical risk assessment, see JP 3-09.3, *Joint Close Air Support*.

synchronization required to minimize friendly fire and collateral damage, tasks normally done by a JTAC or FAC(A). Non-JTAC personnel should advise the aircrew they are not a JTAC. In these circumstances,CAS aircrew should assist non-JTAC-qualified personnel or units to the greatest extent possible to bring fires to bear.

Due to the complexity of air support, the ground commander must consider the increased risk of friendly fire and collateral damage when using personnel who are not JTAC or FAC(A) qualified. Therefore, the requester must alert their command element when a JTAC or FAC(A) is unavailable to conduct Type 1, 2, or 3. If the maneuver commander accepts the risk, the request is forwarded to the CAS controlling agency. This information alerts the CAS controlling agency (e.g., ASOC, DASC, AOC) that aircrews are working with non-JTAC personnel.[46] **CAS with non-JTAC personnel should be considered an emergency procedure, only to be accomplished when a ground force requires fire support to prevent themselves from being captured or destroyed.** CAS with non-JTAC personnel should only be executed long enough for the ground forces to regain fire superiority or break contact with the enemy forces to a point where they are no longer taking effective enemy fire.

FRIENDLY FIRE AND COLLATERAL DAMAGE AVOIDANCE

Avoiding friendly fire and minimizing collateral damage is crucial to effectively employing 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 friendly fire and civilian casualties. Although occasionally attributed to weapons malfunction, friendly fire, and civilian casualties are most often the result of confusion on and over the battlefield. The law of war does not prohibit collateral damage. However, the rule of proportionality dictates that harm caused to civilians or civilian property must be proportional and not excessive in relation to the concrete and direct military advantage anticipated. Precautions must also be taken in planning and execution to reduce the risk of unintentional harm to protected persons and objects. Excessive collateral damage, particularly disproportional harm to civilians, may hinder the ability to achieve strategic objectives.

Causes include misidentification of targets, target location errors, target or friendly locations incorrectly transmitted or received, or a loss of situational awareness by JTACs, CAS aircrews, or ASR agencies. Items that can significantly reduce the likelihood of friendly fire and civilian casualties are sound procedures for friendly force tracking, immediate air requests, and clearance of fires, detailed mission planning, realistic training and mission rehearsal, use of friendly tagging or tracking devices, and effective coordination.

Mitigating collateral damage should be considered a friendly critical requirement during center of gravity analysis, and planners should consider second and third-order effects during operational planning.

[46] For additional information on CAS standard procedures and terminology, see AFTTP 3-2.6, *MTTP for the Joint Application of Fire*.

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 before 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.[47] Performed in accordance with the ROE, CID characterizations enable engagement decisions and the subsequent use, or prohibition of use, of weaponry to create both lethal and nonlethal effects 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.[48]

Risk assessment is a critical factor in preventing friendly fire and civilian casualties. As the battlefield situation changes, commanders and staff 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 weighs the benefits and liabilities of authorizing specific weapon types or a particular type of 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, ordnance effects, and the proximity of friendly troops.

Risk-estimate distances allow the supported commander to estimate the potential danger to friendly troops from a CAS attack. The supported commander accepts responsibility for the inherent risk to friendly forces when targets are within “danger-close” by passing their initials to the attacking CAS aircraft through the JTAC or FAC(A).[49]

DIGITALLY AIDED CAS CONSIDERATIONS

Aircraft and JTAC digital systems provide the opportunity to increase CAS execution effectiveness and efficiency by improving the speed and accuracy of information exchange between the JTAC/FAC(A) and the attacking aircraft. DACAS systems use tactical data links (TDLs) to increase the situational awareness of CAS teams in the AO, expedite target acquisition, and shorten the engagement timeline. The three most common TDLs used for DACAS are Variable Message Format (VMF, K-series messages), situational awareness data link (SADL), and Link 16 (both J-series messages).

DACAS mission planning includes ensuring digital system compatibility and connectivity. Some of this information may be published in the operations task link (OPTASKLINK) for a given AO, or it could be standardized via air component data link SPINS prior to execution. Regardless, an accurate exchange of DACAS technical data between the JTAC/FAC(A) system and aircraft must occur to enable connectivity and understand capability. Each aircraft and JTAC/FAC(A) system has unique capabilities and limitations. For example, some systems may not be able to send or receive specific types of K or J

[48] For additional information on clearance of fires and CID, see JP 3-09, *Joint Fire Support*.
[49] For detailed discussions of risk-estimate distances, see JP 3-09.3, *Joint Close Air Support*, and AFTTP 3-2.6, *MTTP for the Joint Application of Firepower*.

series messages or there may be character limits on the length of the messages able to send or receive. These limitations may be overcome by thorough mission planning, the implementation of DACAS SPINS, and rehearsal by the CAS team before CAS mission execution.[50]

While DACAS offers advantages to CAS mission execution, voice transmissions remain the principal means of communication during CAS. DACAS procedures assist with the exchange of CAS information but do not negate the requirement for specific exchanges of voice communication to complete CAS target engagements, such as target correlation communications or the delivery of weapons release clearances. DACAS is also subject to jamming and spoofing of the electromagnetic spectrum. While certain DACAS TTPs can be used to mitigate the effects of RF communication jamming, the degradation or denial of TDLs forces CAS teams to revert to voice communications for successful CAS mission execution.

[50] For more information about DACAS, see JP 3-09.3 Appendix D, *Joint Close Air Support*.

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