

Joint Publication 3-30



Command and Control for Joint Air Operations



12 January 2010



Report Documentation Page

*Form Approved
OMB No. 0704-0188*

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

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|---|------------------------------------|---|---|-----------------------------------|---------------------------------|
| 1. REPORT DATE 12 JAN 2010 | 2. REPORT TYPE | 3. DATES COVERED 00-00-2010 to 00-00-2010 | | | |
| 4. TITLE AND SUBTITLE Command and Control for Joint Air Operations | | 5a. CONTRACT NUMBER | | | |
| | | 5b. GRANT NUMBER | | | |
| | | 5c. PROGRAM ELEMENT NUMBER | | | |
| 6. AUTHOR(S) | | 5d. PROJECT NUMBER | | | |
| | | 5e. TASK NUMBER | | | |
| | | 5f. WORK UNIT NUMBER | | | |
| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Joint Chiefs of Staff, Washington, DC | | 8. PERFORMING ORGANIZATION REPORT NUMBER | | | |
| 9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) | | 10. SPONSOR/MONITOR'S ACRONYM(S) | | | |
| | | 11. SPONSOR/MONITOR'S REPORT NUMBER(S) | | | |
| 12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited | | | | | |
| 13. SUPPLEMENTARY NOTES | | | | | |
| 14. ABSTRACT | | | | | |
| 15. SUBJECT TERMS | | | | | |
| 16. SECURITY CLASSIFICATION OF: | | | 17. LIMITATION OF ABSTRACT Same as Report (SAR) | 18. NUMBER OF PAGES 141 | 19a. NAME OF RESPONSIBLE PERSON |
| a. REPORT unclassified | b. ABSTRACT unclassified | c. THIS PAGE unclassified | | | |

PREFACE

1. Scope

This publication provides joint doctrine for the command and control of joint air operations across the range of military operations.

2. Purpose

This publication has been prepared under the direction of the Chairman of the Joint Chiefs of Staff. It sets forth joint doctrine to govern the activities and performance of the Armed Forces of the United States in joint operations and provides the doctrinal basis for interagency coordination and for US military involvement in multinational operations. It provides military guidance for the exercise of authority by combatant commanders and other joint force commanders (JFCs) and prescribes joint doctrine for operations, education, and training. It provides military guidance for use by the Armed Forces in preparing their appropriate plans. It is not the intent of this publication to restrict the authority of the JFC from organizing the force and executing the mission in a manner the JFC deems most appropriate to ensure unity of effort in the accomplishment of the overall objective.

3. Application

a. Joint doctrine established in this publication applies to the joint staff, commanders of combatant commands, subunified commands, joint task forces, subordinate components of these commands, and the Services.

b. The guidance in this publication is authoritative; as such, this doctrine will be followed except when, in the judgment of the commander, exceptional circumstances dictate otherwise. If conflicts arise between the contents of this publication and the contents of Service publications, this publication will take precedence unless the Chairman of the Joint Chiefs of Staff, normally in coordination with the other members of the Joint Chiefs of Staff, has provided more current and specific guidance. Commanders of forces operating as part of a multinational (alliance or coalition) military command should follow multinational doctrine and procedures ratified by the United States. For doctrine and procedures not ratified by the United States, commanders should evaluate and follow the multinational command's doctrine and procedures, where applicable and consistent with US law, regulations, and doctrine.

For the Chairman of the Joint Chiefs of Staff



LLOYD J. AUSTIN III
Lieutenant General, USA
Director, Joint Staff

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SUMMARY OF CHANGES
REVISION OF JOINT PUBLICATION (JP) 3-30, DATED 05 JUNE 2003

- **Introduces the definition of “air domain” and “joint air component coordination element (JACCE) and updates definitions for “air and space expeditionary task force” and “air and space operations center”**
- **Adds guidance on various joint force air component commander (JFACC) organizational options**
- **Changes the joint air estimate process to the joint operation planning process for air, in accordance with JP 5-0, *Joint Operation Planning*, and revises discussion of the air tasking cycle**
- **Adds discussion and description of “theater air ground system,” “theater air control system,” “Army air ground system,” “Navy tactical air control system,” and “Marine air command and control system”**
- **Updates targeting terms for consistency with JP 3-60, *Joint Targeting***
- **Removes “joint guidance and apportionment team” and replaces it with “targeting effects team”**
- **Revises the description of the JFACC’s responsibilities and adds space coordinating authority as another duty the joint force commander could designate to perform**
- **Adds a discussion of unmanned aircraft system considerations**
- **Provides samples of a mission Statement and Commanders Intent, a Joint Air Estimate, a Joint Air Operations Plan, an Air Operations Directive, an Airspace Control Plan, and an Area Air defense Plan**
- **Provides description and notional examples of the JACCE**

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EXECUTIVE SUMMARY

COMMANDER'S OVERVIEW

- Provides joint doctrine for the command and control of joint air operations.
 - Discusses the joint force commander's options for exercising command and control over joint air operations.
 - Describes joint and Service command and control systems for air operations and how they interoperate.
 - Considers factors related to tasking attached and assigned air assets.
 - Covers options for implementing joint force air component commander operations.
 - Discusses the role of the joint force air component commander and associated command and control systems and processes.
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Overview

Scope and Purpose.

This publication provides joint doctrine for the command and control (C2) of joint air operations across the range of military operations and discusses responsibilities of a joint force air component commander (JFACC). It sets forth joint doctrine to govern the activities and performance of the Armed Forces of the United States in joint operations and provides the doctrinal basis for interagency coordination and for US military involvement in multinational operations.

Introduction

Command and Control (C2).

C2 is established through command relationships as described in Joint Publication (JP) 1, *Doctrine for the Armed Forces of the United States* and JP 3-0, *Joint Operations*.

The air domain is described as the atmosphere, beginning at the Earth's surface, extending to the altitude where its effects upon operations become negligible.

The degree of control over the air domain can range from no control, to a parity (neutral) situation, to local

air superiority in a specific area, to air supremacy over the entire operational area.

Organization of Forces.

Joint force commanders (JFCs) organize forces to accomplish the mission based on their vision and concept of operations and provide direction and guidance on command relationships. The JFC's air component should be organized for coordinated action (through unity of command) using joint force air capabilities. Centralized control and decentralized execution are key considerations.

There are three basic organizational options; in each a key task is organizing the staff, C2 system, and subordinate forces. The options are: (1) JFC designates a functional component commander as JFACC; (2) JFC designates a Service component commander; or (3) JFC chooses a staff option.

Joint Air Operations.

Joint air operations are performed by forces made available for joint air tasking and do not include air operations a component conducts as an integral part of its own operations. They normally are conducted using centralized control and decentralized execution. The framework and process for C2 of joint air operations are consistent across the range of military operations.

Command And Control of Joint Air Operations

The JFC has the authority to organize assigned/attached forces to best accomplish the assigned mission. The JFC can exercise C2 through a functional component commander by designating a JFACC, through a Service component commander, or through the joint force staff. Many factors will weigh on the JFC's selection.

Factors in deciding whether to appoint a joint force air component commander (JFACC).

Factors include:

- Span of control considerations for the JFC
- Whether joint air operations are the only operations or are of limited duration and scope
- Availability of expertise in employment of joint air assets
- Complexity and scope of joint air operations

Theater-level considerations also play a role; for

example, the geographic combatant commander (GCC) decides whether air forces/capabilities can be most effectively employed at JFC level or by retaining them at GCC level, or a combination thereof.

The JFC normally designates a JFACC to establish unity of command and unity of effort. JFACC responsibilities are normally assigned to the component commander with the preponderance of forces to be tasked and the ability to plan, task, and control joint air operations.

The JFACC is given authority to accomplish missions and tasks assigned by the JFC and normally has operational control (OPCON) of forces assigned and tactical control over forces made available for tasking.

The JFC may designate the JFACC as the supported commander for strategic attack, air interdiction, and airborne intelligence, surveillance, and reconnaissance (ISR) (among other missions).

Responsibilities of the JFACC.

The responsibilities of the JFACC are assigned by the JFC and include planning, coordinating, tasking, executing, monitoring, and assessing joint air operations and the allocation and tasking of joint air operation forces.

Airspace Control Authority (ACA).

The airspace control authority (ACA) is the commander designated by the JFC to assume overall responsibility for the operation of the airspace control system (ACS) in the airspace control area.

Depending on the mission and rules of engagement, the degree of control of air assets may need to be rigorous, close, and restrictive especially in environments that can transition from combat to noncombat and back again. The JFC will determine the degree of airspace control required in the joint operations area.

ACA Responsibilities.

The ACA achieves airspace control through positive or procedural methods, to include centralized direction of the airspace control plan, with the authority of the airspace control orders (ACOs), supplemented by airspace control measures, coupled with an ACS, and coordinated with joint force components' liaisons. The

ACA integrates and coordinates airspace requirements of all components.

Area Air Defense Commander (AADC).

The area air defense commander (AADC) is responsible for defensive counterair (DCA) operations, to include integrated air and missile defenses. DCA and offensive counterair operations combine as the counterair mission designed to attain the degree of air superiority desired.

DCA operations are integrated with other air operations through the area air defense plan. The AADC normally integrates the capabilities of different components with a robust C2 architecture.

AADC responsibilities include, but are not limited to, planning, integrating, synchronizing, and coordinating DCA operations with other tactical operations. This may be facilitated by the JFC's designation of regional and sector air defense commanders.

Joint Air Operations C2 System.

The C2 system for joint air operations will vary depending on the operational area and specific missions. Normally, the joint air operation C2 system is built around the C2 system of the Service component commander designated as JFACC. When the theater air control system (TACS) and the relevant C2 systems of all components are integrated the entire system is labeled the theater air-ground system.

US Air Force C2 System.

The TACS is the commander, Air Force forces mechanism for C2 of component air and space power, comprising airborne and ground elements to conduct tailored C2 of air and space operations throughout the range of military operations. The air and space operations center (AOC) is the senior C2 element of the TACS.

US Army C2 System.

The Army air-ground system (AAGS) synchronizes, coordinates, and integrates airspace users, air and missile defense, fires, and other warfighting functions with the Army ground commander's scheme of maneuver. Although some elements supporting AAGS belong to different Services or nations, they function as a single entity in planning, coordinating, deconflicting, and integrating air support operations with Army

ground operations. When they are operating in this capacity, TACS and AAGS are often referred to TACS-AAGS. The AAGS provides interface between Army and tactical air support agencies of other Services. Coordination between TACS and AAGS includes the battlefield coordination detachment in the AOC and the air component coordination element at the Army component commander's headquarters. The air support operations center (ASOC) is the next level of Air Force-Army integration and provides primary control of air power in support of the Army continuing down through the Air Force component liaisons aligned with land combat forces. The ASOC's primary mission is to provide direction and control of air operations directly supporting Army ground forces.

US Navy C2 System.

The Navy tactical air control system is the air control system afloat for amphibious air operations and is comprised of the Navy tactical air control center (TACC), tactical air direction center, and helicopter direction center. The Navy TACC is the primary air control agency within the amphibious operations area for all air operations supporting the amphibious task force. The maritime operations center (MOC) provides the commander (numbered fleet commander, Navy component commander [NCC], or joint force maritime component commander [JFMCC]) with functionally organized staff and C2 systems. Operational level air planning occurs in the MOC. Planning is collaborative involving the MOC, the joint air operations center (JAOC), and Navy task force commanders and other subordinate staffs. The JFMCC/NCC provides overall operational level guidance and planning. Tactical air planning is conducted largely by subordinate forces at sea.

US Marine Corps C2 System.

The Marine air command and control system consists of various air C2 agencies providing the Marine air-ground task force (MAGTF) aviation combat element (ACE) commander with the ability to monitor, supervise, and influence the application of Marine forces. The Marine Corps' focal point for tasking and exercising OPCON over Marine Corps aviation is the Marine Corps TACC, which performs similar duties for organic Marine Corps aviation to those that the AOC performs for Air Force component operations. The

direct air support center is the principal air control agency responsible for air operations that support Marine ground forces. It functions in a decentralized mode, but is directly supervised by the Marine TACC, and is roughly equivalent to the Air Force's ASOC. The tactical air operations center, subordinate to the Marine TACC, is the principal air defense agency in the MAGTF and provides real time surveillance, direction, positive control, and navigational assistance for friendly aircraft.

The JFACC.

The JFACC establishes a close working relationship with the JFC. This extends through the JFC and JFACC staffs and other component staffs with a role in supporting the JFC with air power capabilities. The JFACC normally operates from a JAOC. The JAOC and the JFACC's staff are manned with subject matter experts who reflect the capabilities/forces available to the JFACC for tasking and include appropriate component representation.

The Joint Air Operations Center (JAOC).

The JAOC operates as a fully integrated command center and is staffed by all participating components. A JAOC provides the capability to plan, coordinate, allocate, task, execute, monitor, and assess the activities of assigned or attached forces. Staffing includes functional area experts (e.g., intelligence, meteorological and oceanographic, logistics, space operations, legal, airspace, plans, and communications personnel) and mission experts (e.g., air-to-air, air-to-ground, ground-to-air, information operations, reconnaissance, air refueling, and other areas). The nucleus of the JFACC staff should be trained in joint air operations and be representative of the joint force. The role of intelligence is extremely important and is an integral part of the functions of the JAOC.

The joint air component coordination element (JACCE).

The JFACC may establish one or more joint air component coordination elements (JACCEs) with other commanders' headquarters to better integrate joint air operations with their operations. The JACCE is a component level liaison that serves as the direct representative of the JFACC.

Tasking Component Forces.

The JFC has authority to provide a component's forces for joint air tasking and determine what air

capabilities/forces to make available for joint air operations, in consultation with component commanders. Forces are tasked by the JFACC based on the JFC's approval of the JFACC's air apportionment recommendation (e.g., close air support, interdiction). The inclusion of air assets in the air tasking order (ATO) does not imply any change in command relationships or tasking authority.

Tasking US Army Forces.

Army forces are normally employed as part of the combined arms team. Army aviation, air defense, fires (e.g., Army Tactical Missile System), and other forces made available to the JFACC are in a support relationship. The integration of Army forces and other component airspace users, to include unmanned aircraft systems (UASs) and fires, requires detailed planning and coordination.

Tasking US Marine Corps Forces.

The ACE within the MAGTF has the primary mission to support the MAGTF ground combat element. During joint operations, MAGTF aviation assets normally are in support of the MAGTF mission. The MAGTF commander makes sorties available to the JFC for JFACC tasking, air defense, long range air interdiction, and long-range reconnaissance. Sorties in excess of MAGTF direct support requirements will be provided to the JFC for tasking through the JFACC.

Tasking US Navy Forces.

Navy aviation assets normally are retained for employment in support of the assigned joint maritime missions. Assets include sea- and land-based naval aircraft. Navy assets not required for assigned joint missions or for fleet defense will normally be made available for tasking via the joint air tasking process.

Tasking US Air Force Forces.

The air and space expeditionary task force (AETF) is the primary means by which the Air Force presents forces to a JFC. AETFs are sized and tailored to meet specific mission requirements. To plan, execute, and assess air and space operations, the Air Force has developed tailored Air Force AOCs that can be networked to provide a full range of Air Force air, space, and cyberspace capabilities to the JFC. In most cases, all Air Force forces assigned aircraft are made available for employment as directed by the JFACC.

Tasking Special Operations Forces Aviation Forces.

The joint force special operations component commander (JFSOCC)/commander, joint special operations task force (CDRJSOTF) may designate a joint special operations air component commander (JSOACC) for planning and executing joint special operations air activities. If a JSOACC is not designated, special operations forces (SOF) air power is usually controlled by its Service component within the joint force special operations command. When SOF aviation assets are employed primarily in support of conventional air operations, the JFC may make these sorties available to the JFACC for tasking. Special operations must be integrated into, and closely coordinated with, other air operations in theater. In order to coordinate and deconflict operations, the JFSOCC and JFACC exchange liaison teams.

JFACC Options.

There are several options for implementing JFACC operations. These include the designation of a JFACC for each JFC subordinate to the GCC, establishment of an overall theater JFACC, multiple JFACCs sharing a theater JAOC, and theater JFACC or joint task force's (JTF's) JFACC operating concurrently with a JSOACC assigned to a CDRJSOTF. There can be organizational variations among these options.

The Joint Force Staff Option.

In operations of limited scope, duration, or complexity, or in which air operations are a relatively small aspect of the overall joint force, the JFC may plan, direct, and control joint air operations through the JFC staff. In this case, the JFC retains command authority and responsibility and normally requests augmentation from appropriate components to perform the C2 air function. The JFC staff operates out of the joint operations center (JOC) and under this option, the JOC also functions as the C2 node for joint air operations. The JFC staff derives its authority from the JFC. JFC staff relationships and responsibilities must be specified. Although command authority for tasking subordinate commanders is retained by the JFC, the JFC may assign responsibility for coordinating joint air operations to a staff directorate (e.g., the operations directorate of a joint staff [J-3]), a specific staff officer (e.g., J-3 air officer), or a special staff. Staff responsibilities include planning, coordination, and execution of joint air operations. The JFC may also direct components to

provide support for joint air operations with assets, capabilities, or forces, in addition to the air capabilities/forces provided.

Liaisons.

In addition to the JFC and his staff, other component commanders and their staffs require continuous and ready access to the JFACC and the JFACC's staff. Principle means of accomplishing this is through personal contact, the established communications and information support system, and liaison personnel. These liaisons work for their respective component commanders and work with the JFACC and staff. Each component normally provides liaison elements that work within the JAOC and serve as conduits for direct coordination between the JFACC and their respective component commander. Other liaisons may include intergovernmental organizations, other government agencies, nongovernmental organizations, and contractors conducting activities near or in areas of military operations.

The JFACC may be land-based or sea-based. The JFACC should develop a plan for transition of JFACC duties to another component or location. Planned transitions are possible as a function of buildup or scale down of joint force operations. Unplanned shifts of JFACC responsibility may occur, possibly as a result of battle damage or major C2 equipment failure. The JFC should predesignate alternates and establish planned responses to the temporary or permanent loss of primary JFACC capability.

Communications System.

The JFACC is responsible for identifying and validating joint air requirements that affect the JFC's mission and allow accomplishment of the JFC's directives. Reliable secure communications among the JFC, joint force staff, and component commanders is key to the successful integration of the joint air effort. Data exchange requirements should be promulgated as early as possible; planning for information exchange requirements and procedures should consider all elements of information and cyberspace operations; and the best mix of computer-aided systems should be available for data transmission. The JAOC and liaison elements depend on secure, reliable, beyond-line-of-sight communications and data exchange equipment to

respond to joint force requirements.

Planning And Execution of Joint Air Operations

This section assumes that the JFC has designated a JFACC. Planning for joint air operations begins with understanding the JFC's mission and intent. The JFC's estimate of the operational environment and articulation of objectives needed to accomplish the mission form the basis for components' objectives. The JFACC's daily guidance ensures that joint air operations support joint force objectives while retaining flexibility in execution.

The Joint Air Estimate.

The joint air estimate is a process by which the air component commander considers all the circumstances affecting the military situation and decides a course of action (COA) to accomplish the mission.

JFACC Planning Responsibilities.

The JFACC is responsible for planning joint air operations and uses the joint operation planning process for air (JOPPA) to develop a joint air operations plan (JAOP) that guides employment of air capabilities and forces. The JFACC provides focus and guidance to the JAOC staff and ensures that planning occurs in a collaborative manner with other components.

The JAOP is the JFACC's plan for integrating and coordinating joint air operations and encompasses air capabilities and forces supported by, and in support of, other joint force components.

The Joint Operation Planning Process for Air.

JOPPA is a seven-step process similar to the joint operation planning process. JOPPA culminates in the production of the JAOP and supporting plans and orders. JOPPA's seven steps are:

- Initiation
- Mission analysis
- COA development
- COA analysis and wargaming
- COA comparison
- COA approval
- Plan or order development

Joint Targeting Process.

Targeting is the process of selecting and prioritizing targets and matching the appropriate response to them. Targeting is both a joint- and component-level function that determines desired effects necessary to accomplish JFC objectives. The joint targeting cycle is an iterative process. The deliberate and dynamic nature of the joint targeting process is adaptable through all phases of the air tasking cycle. There are six phases: end state and commander's objectives, target development and prioritization, capabilities analysis, commander's decision and force assignment, mission planning and force execution, and assessment. Targeting mechanisms should exist at multiple levels.

The Joint Targeting Coordination Board.

Typically, the JFC organizes a joint targeting coordination board (JTCCB) to develop broad targeting priorities and other guidance. The JFC defines the role of the JTCCB, which provides a forum for components to articulate strategies and priorities for future operations to ensure they are integrated and synchronized. The JFC normally delegates authority to conduct execution planning, coordination, and deconfliction of joint air targeting to the JFACC.

The Targeting Effects Team.

The JFACC normally has a targeting effects team (TET) as part of the JAOC, with responsibilities varied but key to the targeting process. It links targets and capabilities to guidance on desired effects, deconflicts and coordinates target nominations and provides other targeting support requiring component input at the JFACC level. The TET also receives all target nominations (that cannot be addressed at lower echelon levels) and prioritizes them to form the draft joint integrated prioritized target list (JIPTL).

The draft JIPTL is formed from a prioritized target list based on JFC and component target priorities. The TET considers the estimated available air capabilities and their ability to affect the targets on the list. A draft JIPTL "cut line" is normally established, reflecting which targets will most likely be serviced with the projected apportionment of air assets. The JFACC may recommend to the JFC that other component assets be used against targets on the draft JIPTL. Close coordination occurs with the development of the JIPTL and the joint integrated prioritized collection list to

ensure effective, efficient use of assets that may be used against targets on both. The JFC approves this use of other components' assets and forces.

The Joint Air Tasking Cycle.

The joint air tasking process provides for the employment of joint air capabilities and forces. It provides an iterative, cyclic process for the planning, apportionment, allocation, coordination, and tasking of joint air missions and sorties. The joint air tasking cycle begins with the JFC's objectives, incorporates other JFC guidance received, and culminates with assessment of previous actions. The ATO articulates the tasking for joint air operations for a specific timeframe, normally 24 hours. The full air tasking cycle, from JFC guidance to the start of ATO execution is dependent on the JFC's and JFACC's procedures, but a 72-hour cycle is fairly standard. The ATO matches specific targets with the capabilities and forces made available to the JFACC for the given ATO day.

The joint air tasking cycle consists of 6 stages. These stages are interrelated with portions of the joint targeting process. The joint air tasking cycle is time-dependent, built around finite time periods required to plan, prepare for, and conduct joint air operations. The number and length of ATO development phases may vary based on contingency requirements. The standard six stages are:

- Objectives, effects, and guidance
- Target development
- Weaponeering and allocation
- ATO production and dissemination
- Execution planning and force execution
- Assessment

Intelligence, Surveillance, and Reconnaissance Considerations.

The GCC (theater intelligence directorate of a joint staff [J-2]) may retain collection management authority (CMA) to establish, prioritize, and validate theater collection requirements, establish sensor tasking guidance, and develop theater-wide collection policies. CMA may reside at the JTF level or be delegated to components. The theater J-2 retains full management authority (to validate, to modify, or to nonconcur) over intelligence collection requirements within the area of responsibility. Airborne ISR aircraft are typically high

demand assets due to mission duration, the ability to quickly respond to requests, and their ability to support multiple users. The JFACC will normally be the supported commander for the airborne ISR effort. National and non-Department of Defense ISR resources are not normally under the JFC's OPCON. These resources may provide direct support to the JFC or a component, either full-time or on-call. ISR personnel are integrated into the JAOC, and the JFACC provides integrated airborne ISR for the JFC.

Air Mobility Considerations. Air mobility missions are integral to the success of joint operations. Airlift is critical for deployment, redeployment, and sustainment while aerial refueling is critical to enable and sustain air operations. The director of mobility forces (DIRMOBFOR) functions as coordinating authority for air mobility with all commands and agencies, both internal and external to the JTF. The DIRMOBFOR exercises coordinating authority among theater AOC (or theater JAOC if established), Air Mobility Command's 618th Tanker Airlift Control Center, and the joint movement center (JMC)/joint deployment and distribution operations center (JDDOC), for air mobility issues. An essential role for the DIRMOBFOR is serving as the principal interface between the JAOC, the theater's logistics directorate of a joint staff, and the JMC/JDDOC to ensure appropriate prioritization of air mobility tasks. When a JTF is formed, command relationships for air mobility forces are established in accordance with the Unified Command Plan and Global Force Management process.

Unmanned Aircraft Systems Considerations. UASs are treated similarly to manned systems with regard to established doctrinal principles. While the C2 processes for UASs are similar to those for manned assets, several factors can make C2 challenging. UAS communication links are generally more critical than for manned systems, relying on a nearly continuous stream of communications for both flight control and payload for mission success; therefore communications security, especially bandwidth protection, is an important consideration. UASs may be capable of transferring control of the aircraft and/or payloads to multiple operators while airborne, making coordination important. Most larger UASs have longer endurance

times than comparable manned systems, an important planning factor. Finally, compliance with the ACO is critical as UA generally cannot “see and avoid” other aircraft. The JFC process for determining what UASs to allocate to the JFACC will be no different than for the manned aircraft allocation decision process. Theater-capable UASs are able to range the theater of operations and/or support multiple users. If a UAS or the payload is reallocated to support another commander’s objective, the supported commander should, to the maximum extent, take advantage of the established C2 architecture. UASs can be critical to the success of dynamic targeting missions and the prosecution of targets of opportunity (unplanned, unanticipated) or time sensitive targets. Current doctrinal planning considerations for manned aircraft are applicable to UA, with minor modification.

CONCLUSION

This publication provides joint doctrine for the command and control of joint air operations across the range of military operations.

CHAPTER I

INTRODUCTION



“The lesson from the last war that stands out clearly above all the others is that if you want to go anywhere in modern war, in the air, on the sea, on the land, you must have command of the air.”

**Fleet Admiral William F. “Bull” Halsey
Testimony to Congress following WW II**

1. General

This publication provides joint doctrine for the command and control (C2) of joint air operations and discusses the responsibilities of a joint force air component commander (JFACC). Although the joint force commander (JFC) has several organizational options for joint air operations, a JFACC is often the first option for consideration.

a. C2 is established through command relationships among commanders as described in Joint Publication (JP) 1, *Doctrine for the Armed Forces of the United State*, and JP 3-0, *Joint Operations*.

b. **Air Domain.** The air domain is described as the atmosphere, beginning at the Earth’s surface, extending to the altitude where its effects upon operations become negligible. While domains are useful constructs for visualizing and characterizing the physical environment in which operations are conducted (the operational area), the use of the term “domain” is not meant to imply or mandate exclusivity, primacy, or command and control of any domain.

c. **Degree of Control.** Dominance of the air domain cannot be assumed. In the air domain, the degree of control can range from no control, to a parity (or neutral) situation wherein neither adversary can claim any level of control over the other, to local air superiority in a specific area, to air supremacy over the entire operational area. Control may vary over time. It is important to remember that the degree of control in the air domain lies within a spectrum that can be enjoyed by any combatant. Likewise, that degree of control can be localized geographically (horizontally and vertically), or defined in the context of an entire theater.

d. Commanders at all levels must consider how our space and cyberspace capabilities enhance the effectiveness and execution of joint air operations. It is important to understand that in today’s complex operational environment, adversary actions can be conducted on, from, within, and outside of the operational area, all with potentially global impacts and influence.

2. Organization of Forces

a. JFCs organize forces to accomplish the mission based on their vision and a concept of operations (CONOPS) developed in coordination with their component commanders and supporting organizations. JFCs provide direction and guidance to subordinate commanders and establish command relationships to enable effective spans of control, responsiveness, tactical flexibility, and protection. The JFC's air component should be organized for coordinated action (through unity of command) using the air capabilities of the joint force. Centralized control and decentralized execution are key considerations when organizing for joint air operations. While JFCs have full authority, within establishing directives, to assign missions, redirect efforts, and direct coordination among subordinate commanders, they should allow Service tactical and operational groupings to generally function as they were designed. The intent is to meet the needs of the JFC while maintaining the tactical and operational integrity of the Service organizations.

See JP 3-0, Joint Operations, for further discussion on the organization of forces.

b. A JFC has three basic organizational options affecting C2 of joint air operations. In each case a key task includes organizing the staff, C2 system, and subordinate forces that will plan, execute, and assess joint air operations. Each option, below, is further discussed in Chapter II, "Command and Control of Joint Air Operations."

- (1) A JFC may designate a functional component commander, JFACC.
- (2) A JFC may designate a Service component commander.
- (3) A JFC may choose a staff option.

c. The JFACC is the commander within a unified command, subordinate unified command, or joint task force (JTF) that is responsible for tasking joint air forces, planning and coordinating joint air operations, or accomplishing such operational missions as may be assigned. The JFACC is given the authority necessary to accomplish missions and tasks assigned by the establishing commander. **The JFC will base the decision to designate a JFACC on several factors**, such as:

- (1) JFC overall mission.
- (2) CONOPS.
- (3) Mission and tasks assigned to subordinate commanders.
- (4) Forces available.
- (5) Duration and nature of joint air operations desired.

(6) Desired level of C2 for joint air operations.

3. Joint Air Operations

a. Joint air operations are performed by forces made available for joint air tasking. Joint air operations do not include those air operations that a component conducts as an integral part of its own operations.

b. **Joint air operations are normally conducted using centralized control and decentralized execution** to achieve effective control and foster initiative, responsiveness, and flexibility. In joint air operations centralized control is giving one commander the responsibility and authority for planning, directing, and coordinating a military operation or group/category of operations. Centralized control facilitates integration of forces to provide guidance, organization, and control to the joint air effort and maintain the ability to focus the impact of joint air forces wherever needed across the operational area. Command relationships are established by the JFC within his command. Decentralized execution is the delegation of execution authority to subordinate commanders. This makes it possible to generate the required tempo of operations and to cope with the uncertainty, disorder, and fluidity of combat.

c. All component forces must adhere to the JFC's guidance provided by the rules of engagement (ROE), airspace control plan (ACP), the airspace control order (ACO), the area air defense plan (AADP), and the special instructions (SPINS) located in the air tasking order (ATO) to maximize combat effectiveness, minimize the risk of fratricide, and assure deconfliction

"We better be prepared to dominate the skies above the surface of the earth, or be prepared to be buried beneath it."

**General Carl "Tooey" Spaatz
(1891-1974)**

d. Though missions vary widely across the range of military operations, the **framework and process for C2 of joint air operations are consistent**. Joint air operations may be complicated by civilian use of airspace, coordination with other government agencies (OGAs), intergovernmental organizations (IGOs), and nongovernmental organizations (NGOs), or integration of multinational or host nation forces. If joint air operations may be hindered by an inadequate host nation airspace control structure, one may have to be established by the joint force.

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CHAPTER II COMMAND AND CONTROL OF JOINT AIR OPERATIONS

“If we lose the war in the air, we lose the war and we lose it quickly.”

Field Marshal Montgomery, 1887-1976

SECTION A. ESTABLISHING COMMAND AND CONTROL

1. Joint Force Commander

a. **Authority.** The JFC has the authority to organize assigned/attached forces to best accomplish the assigned mission based on the CONOPS. The JFC establishes subordinate commands, assigns responsibilities, establishes or delegates appropriate command relationships, and establishes coordinating instructions for subordinate commanders. When organizing joint forces, simplicity and clarity are critical.

See JP 1, Doctrine for the Armed Forces of the United States, for additional doctrinal guidance on command relationships.

b. **C2 Options.** When contemplating C2 options for joint air operations within the operational area, **the JFC can choose to exercise C2 through a functional component commander by designating a JFACC, one of the Service component commanders, or the joint force staff.** Many factors will weigh on the JFC’s selection – most notably the type and availability of forces/capabilities to accomplish the assigned mission. Additional factors may include host and friendly nation support, level and commitment of coalition forces, enemy capabilities and actions, and environmental limitations.

c. **Factors for consideration in determining whether or not to appoint a JFACC include:**

(1) **Span of control** is the JFC’s ability to effectively manage the actions of subordinates. Span of control is based on the number of subordinates, number of activities, range of weapon systems, force capabilities, and the size and complexity of the operational area.

(2) When **joint air operations are the only operations or the duration and scope of air operations are of a very limited nature**, the JFC may elect to plan, direct, and control joint air operations.

(3) **Expertise** in effective and efficient employment of joint air assets to accomplish the JFC’s mission is available. If the JFC elects to conduct joint air operations through his staff, the staff must be properly manned and adequately equipped with both the personnel expertise and the C2 equipment and processes necessary to the joint air effort.

(4) **Complexity and Scope of Joint Air Operations.** The more complex air operations are and/or larger in scope, the JFC should consider establishing a JFACC. This will allow the JFC time to focus on the overall campaign vice spending it on directing air operations.

d. **Theater-Level Considerations.** When the geographic combatant commander (GCC) establishes a subordinate joint command to conduct operations, forces are normally attached as needed, with delegation of operational control (OPCON) to the subordinate JFC. However, the GCC also will weigh the operational circumstances and decide if available air forces/capabilities can be most effectively employed by the subordinate JFC(s), by retaining them at the GCC level, or a combination thereof. This decision requires careful consideration after a thorough dialogue among the joint and Service component/force commanders.

2. Joint Force Air Component Commander

a. **Designation.** The JFC normally designates a JFACC to establish unity of command and unity of effort for joint air operations. The JFC will normally assign JFACC responsibilities to the component commander having the preponderance of forces to be tasked and the ability to effectively plan, task, and control joint air; **however the JFC will always consider the mission, nature, and duration of the operation, force capabilities, and the C2 capabilities in selecting a commander.**

b. **Authority.** The JFACC is given the authority necessary to accomplish missions and tasks assigned by the JFC. The JFACC will normally have OPCON over forces assigned and exercise tactical control (TACON) over forces made available for tasking. Component commanders assigned to the individual JFCs will normally retain OPCON over forces assigned. The JFC may also establish support relationships between the JFACC and other components to facilitate operations. **The JFACC conducts joint air operations in accordance with the JFC's intent and CONOPS.**

c. The JFC may designate the JFACC as the supported commander for strategic attack, air interdiction, and airborne intelligence, surveillance, and reconnaissance (ISR) (among other missions). As such, the JFACC is responsible to the JFC for planning, coordinating, executing, and assessing these missions. Other component commanders may support the JFACC in accomplishing these missions, subject to the demands of their own JFC-assigned missions or as explicitly directed by the JFC.

d. **Responsibilities.** The responsibilities of the JFACC are assigned by the JFC. These include, but are not limited to: planning, coordinating, tasking, executing, monitoring, and assessing joint air operations, and the allocation and tasking of joint air operation forces based on the JFC's CONOPS, operation plan (OPLAN), operation orders, targeting decisions, and air apportionment decisions. **Specific JFACC responsibilities, as shown in Figure II-1, normally include:**

JOINT FORCE AIR COMPONENT COMMANDER RESPONSIBILITIES

- Develop daily anticipatory guidance for construction of the air operations directive
- Develop a joint air operations plan to best support the joint force commander's (JFC's) concept of operations
- Recommend to the JFC apportionment of the joint air effort, after consulting with other component commanders
- Allocate and task air capabilities/forces made available based upon the JFC's air apportionment decision
- Provide oversight and guidance during execution of joint air operations
- Coordinate joint air operations with operations of other component commanders and forces assigned to or supporting the JFC
- Assess the results of joint air operations
- Perform the duties of the airspace control authority (ACA) and/or the area air defense commander (AADC) unless a separate ACA and/or AADC is designated
- Perform the duties of the space coordinating authority when designated
- Accomplish various mission areas to include, but not limited to:
 - ◆ *Counterair*
 - ◆ *Strategic attack*
 - ◆ *Airborne intelligence, surveillance, and reconnaissance*
 - ◆ *Air interdiction*
 - ◆ *Control intratheater and coordinate intertheater air mobility*
 - ◆ *Close air support*
- The joint force air component commander normally is the supported commander for the JFC's overall air interdiction effort, while land and maritime component commanders are supported commanders for interdiction in their area of operations

Figure II-1. Joint Force Air Component Commander Responsibilities

(1) **Develop a joint air operations plan (JAOP)** to best support the JFC's CONOPS or OPLAN (see example in Appendix C, "Sample Joint Air Operations Plan Format").

(2) **Recommend to the JFC air apportionment priorities** that should be devoted to the various air operations for a given period of time, after considering objective, priority, or other criteria and consulting with other component commanders.

(3) **Allocate and task** the air capabilities/forces made available based on the JFC's air apportionment decision.

(4) Develop daily anticipatory **guidance for construction of the air operations directive (AOD)** (see Appendix D, “Sample Air Operations Directive”).

(5) **Provide oversight and guidance during execution of joint air operations**, to include making timely adjustments to taskings of available joint air forces. The JFACC coordinates with the JFC and affected component commanders, as appropriate, or when the situation requires changes to planned joint air operations.

(6) **Assess the results of joint air operations** and forward assessments to the JFC to support the overall assessment effort.

(7) Perform the duties of the **airspace control authority (ACA)**, if designated.

For further detailed discussion of ACA, see JP 3-52, Joint Airspace Control.

(8) Perform the duties of the **area air defense commander (AADC)**, if designated AADC.

For more information on AADC, see JP 3-01, Countering Air and Missile Threats.

(9) Perform the duties of the **space coordinating authority (SCA)**, if designated. The SCA is responsible for coordinating and integrating space capabilities in the operational area and has primary responsibility for joint space operations planning, to include ascertaining space requirements within the joint force.

For further detailed discussion of SCA, see JP 3-14, Space Operations.

(10) Perform the duties of the **personnel recovery (PR) coordinator**, as required.

For further detailed discussion of PR, see JP 3-50, Personnel Recovery.

(11) In concert with the above responsibilities, perform tasks within various mission areas to include, but not limited to:

- (a) Defensive and offensive counterair (OCA).
- (b) Close air support (CAS).
- (c) Airborne ISR and incident awareness and assessment.
- (d) Air mobility operations.
- (e) Strategic attack.
- (f) Air interdiction.

(12) The JFACC normally is the supported commander for the JFC's overall air interdiction effort, while land and maritime component commanders are supported commanders for interdiction in their areas of operations.

3. Airspace Control Authority

a. **The ACA is the commander designated by the JFC to assume overall responsibility for the operation of the airspace control system (ACS) in the airspace control area** (see Figure II-2). The ACA's ACP, approved by the JFC, provides general guidance for the control of airspace (see sample ACP, Appendix E, "Sample Airspace Control Plan"). The tool used by the ACA to exercise this authority is the ACO, which implements specific control procedures for established time periods. The ACO also provides the details of the approved requests for airspace coordinating measures (ACMs). **All air missions are subject to the ACO and the ACP.** The ACO and ACP provide direction to integrate, coordinate, and deconflict the use of airspace within the operational area. (Note: This does not imply any level of command authority over any air assets.) Methods to accomplish this integration, coordination, and deconfliction range from **positive control of all air assets** in an airspace control area to **procedural control of all such assets**, with any effective combination of positive and procedural control between the two extremes (see Figure II-3). The ACA ensures the ACP and ACO facilitate JFC requirements for airspace users.

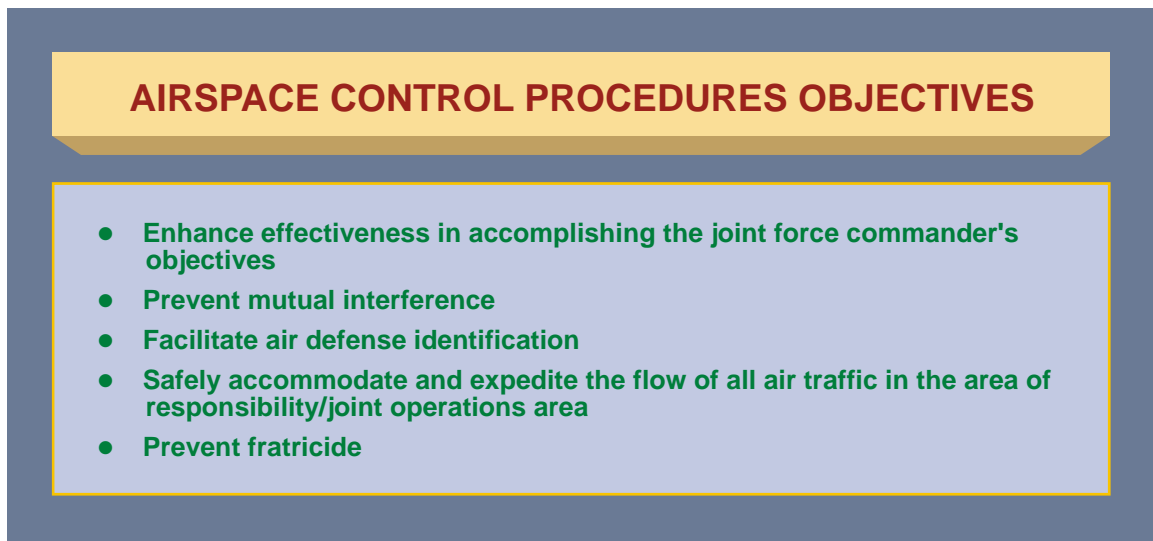


Figure II-2. Airspace Control Procedures Objectives

b. **Airspace Control Considerations.** Depending on the mission and ROE, the degree of control of air assets may need to be rigorous, close, and restrictive, especially in an operational environment that can transition quickly from combat to noncombat and back again. The airspace may require positive control, special ACMs (procedural

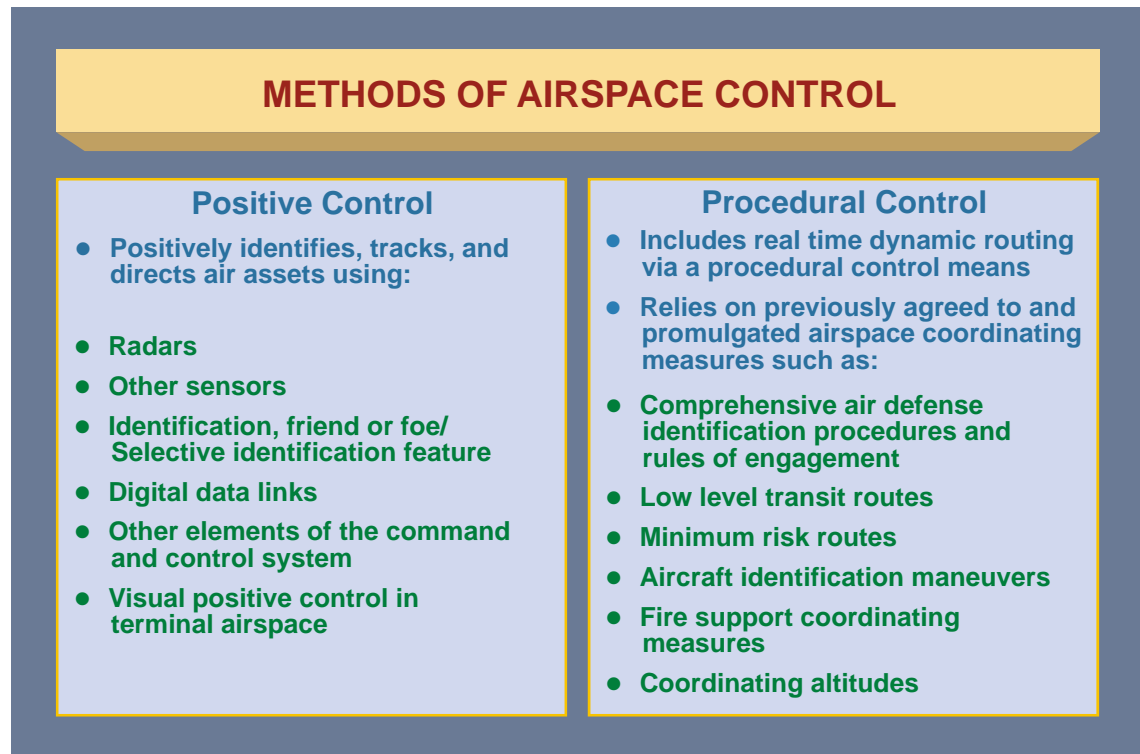


Figure II-3. Methods of Airspace Control

control), and real-time joint battle management to control the operational activity of the joint force including strict constraints on the forces, weapons, and tactics employed.

c. **Additional Airspace Control Considerations.** The JFC will determine the degree of airspace control required in the joint operations area (JOA). The JFC may set a coordinating altitude for designated airspace in the JOA. As a matter of controlling joint air operations, the JFC typically may require **all air missions, including fixed- and rotary-wing, manned and unmanned (except small hand-held systems) of all components, to appear on the appropriate ATO and/or flight plan.** Also, all aircrew and unmanned aircraft (UA) operators must adhere to approved operational procedures. Typically these procedures are promulgated by the JFACC in the SPINS annex of the ATO. This type of rigorous control may be necessary because the mix of friendly, adversary, and neutral aircraft and mission constraints may require the JFC to strictly control flights in the operational area. In this environment, the JFACC may elect to augment forward theater air ground system (TAGS) elements with additional planning personnel, training, and capabilities. No matter what methods the JFC chooses, they need to be continually evaluated for effectiveness and efficiency as the environment and mission change.

d. **ACA Responsibilities.** The ACA achieves airspace control through positive or procedural methods. This includes centralized direction of the ACP, with the authority of the ACOs, supplemented by ACMs, and coupled with an ACS. The ACA should coordinate with joint force components' liaisons prior to commencement of operations.

The ACA must integrate and coordinate the airspace requirements of all the components. The ACA does not have the authority to approve, disapprove, or deny combat operations. That authority is only vested in operational commanders. The ACA assumes overall responsibility for the ACS in an airspace control area. Subject to the authority and approval of the JFC, the broad responsibilities of the ACA include:

- (1) Coordinating and integrating the use of the airspace control area.
 - (2) Developing broad policies and procedures for airspace control and for the coordination required among all users of airspace within the airspace control area.
 - (3) Establishing an ACS that provides for integration of host and other affected nations' constraints and requirements.
 - (4) Coordinating and deconflicting airspace control area user requirements.
 - (5) Promulgating ACS policies and procedures via the JFC-approved ACP.
- e. A key responsibility of the ACA is to provide the flexibility needed within the ACS to meet contingency situations that necessitate rapid employment of forces as well as dynamic changes made by component staffs. The ACO is published either as part of the ATO or as a separate document.

For further detailed discussion of ACA, see JP 3-52, Joint Airspace Control.

4. Area Air Defense Commander

a. **The AADC is responsible for defensive counterair (DCA) operations, which includes integrated air and missile defenses for the JOA.** DCA and OCA operations combine as the counterair mission, which is designed to attain and maintain the degree of air superiority desired by the JFC. In coordination with the component commanders, the AADC develops, integrates, and distributes a JFC approved joint AADP. The AADP is integrated with the ACP by the AADC and the ACA. Typically, for forces made available for DCA, the AADC retains TACON of air sorties, while surface-based air and missile defense forces may be provided in support (e.g., PATRIOT missile systems). As such, the US Army Air and Missile Defense Command (AAMDC) should be collocated with the joint air operations center (JAOC), if established, and conduct collaborative counterair intelligence preparation of the battlespace (IPB), planning, and execution control. In distributed operations, the AAMDC is not necessarily in the JAOC but is still functionally tied to it. Some of the Aegis-equipped/command ships may be made available and assigned tasks in support of the AADC for C2 of air defense in a maritime or littoral area while remaining under the OPCON/TACON of the appropriate Navy force commander.

b. **Area Air Defense Considerations.** DCA operations are integrated with other air operations within the operational area through the AADP (see sample AADP in

JP 3-01, *Countering Air and Missile Threats*). The AADC normally is responsible for developing an integrated air defense system by integrating the capabilities of different components with a robust C2 architecture. **Because of their time sensitive nature, DCA operations require streamlined coordination and decision-making processes, facilitated by the AADP.** The AADP is the integration of active air defense design, passive defense measures, and the C2 system to provide a comprehensive approach to defending against the threat. It should address command relationships, the adversary and friendly situations, the AADC's intent, concept of operation, and logistics and C2 requirements, as well as detailed weapons control and engagement procedures. Weapons control procedures and airspace control procedures for all air defense weapon systems and forces must be established. These procedures must facilitate DCA operations while minimizing the risk of fratricide. Planners must understand they routinely will be required to modify the AADP due to the dynamic nature of joint counterair operations. Ideally, as the JFC's operation/campaign progresses and the AADP is refined, the combination of DCA and OCA operations should diminish the enemy's ability to conduct air and missile attacks, reducing the requirement for DCA operations and the threat to the JFC's freedom of action.

For further detailed discussion, see JP 3-01, Countering Air and Missile Threats.

c. **AADC responsibilities** include planning, integration, synchronization, and coordination of DCA operations with other tactical operations throughout the JOA. This may be facilitated by the JFC's designation of regional and sector air defense commanders. Additional AADC responsibilities include:

(1) Developing, integrating, and distributing a JFC-approved AADP in coordination with Service and functional components.

(2) Developing and executing a detailed plan to disseminate timely air and missile warning and cueing information to components, forces, allies, coalition partners, and civil authorities, as appropriate, in coordination with the intelligence directorate of a joint staff (J-2), the operations directorate of a joint staff (J-3), and the communications system directorate of a joint staff.

(3) Developing and implementing identification and engagement procedures that are appropriate to the air and missile threats.

(4) Ensuring timely and accurate track reporting procedures among participating units to provide a consistent common operational picture.

(5) Establishing air defense sectors or regions, as appropriate, to enhance decentralized execution of DCA.

(6) Preventing fratricide.

(7) Coordinating the protection of those assets listed on the defended asset list (DAL).

d. **Implementation of the AADP** takes place through the SPINS annex of the ATO.

SECTION B. EXERCISING COMMAND AND CONTROL

5. Joint Air Operations Command and Control System

a. **Joint Air Operation C2 System.** The C2 system for joint air operations will vary depending on the operational area and specific missions. Given the flexibility of modern C2 capabilities, geographic considerations have less of an impact on organizational structure today than in the past. The entire C2 system may be spread across the operational area or concentrated in a specific location, either in close proximity to the fight or far from it. Ultimately, there is no standard template for C2 design.

(1) Normally, the joint air operation C2 system will be built around the C2 system of the Service component commander designated as the JFACC. Each of the Service commanders has an organic system designed for C2 of their air operations. Whether it is the Air Force's theater air control system (TACS)/air and space operations center (AOC), the Navy's composite warfare commander (CWC)/Navy tactical air control system (NTACS), Marine air command and control system (MACCS), or the special operations air-ground system (SOAGS) that serves as the nucleus for C2 of joint air operations; the remainder will be integrated to best support the JFC's CONOPS.

(2) **TAGS.** When all elements of the TACS, Army air-ground system (AAGS), CWC/NTACS, MACCS with fire support coordination center hierarchy, and SOAGS integrate, the entire system is labeled the TAGS. Technology has improved the JFACC's ability to command and control joint air power. The speed of modern warfare, as well as the precision of today's weapons, dictate close coordination in the operational area among the JFC's components. The JFACC must ensure all elements of the TAGS are in place and the various liaison positions are filled prior to, or as soon as possible after, the start of an operation or campaign.

b. Air Force

(1) **The TACS is the commander, Air Force forces (COMAFFOR) mechanism** for commanding and controlling component air and space power. It consists of airborne and ground elements to conduct **tailored C2 of air and space operations throughout the range of military operations**, including air defense, airspace control, and coordination of space mission support not resident within theater. The structure of the TACS should reflect sensor coverage, component liaison elements, and the communications systems required to provide adequate support. As an organic Air Force system, the TACS remains under OPCON of the COMAFFOR. In multinational

commands, the name and function of certain TACS elements may differ, but multinational air components have similar capabilities.

(2) **The AOC is the senior C2 element of the TACS** and includes personnel and equipment of necessary disciplines to ensure the effective planning and conduct of component air and space operations (e.g., communications, operations, ISR). The AOC is designed to expand with augmentation to form the JAOC when the COMAFFOR is designated by the JFC as the JFACC

c. Army

(1) **Army Air-Ground System.** The AAGS is used for synchronizing, coordinating, and integrating airspace users, air and missile defense, fires, and other warfighting functions with the Army ground commander's scheme of maneuver. Although some elements supporting AAGS, such as the tactical air control party/air support operations center (ASOC)/air naval gunfire liaison company, belong to different Services or other nations, they function as a single entity in planning, coordinating, deconflicting, and integrating air support operations with Army ground operations. When they are operating in this capacity, TACS and AAGS are often referred to TACS-AAGS (see Figure II-4).

(2) The AAGS provides interface between Army and tactical air support agencies of other Services in the planning, evaluating, processing, and coordinating of air support requirements and operations. Utilizing organic staff members and communications systems, the AAGS works in conjunction with the TACS to coordinate and integrate both Army component aviation support and Air Force component support with Army maneuver. Airspace command and control (AC2) elements are at the senior Army echelon and extend down through all tactical command levels to maneuver units. These are typically brigades, but may be larger or smaller units depending on the mission. The air defense airspace management/brigade aviation element (ADAM/BAE) cell is located in the brigade combat team. The ADAM/BAE coordinates airspace requirements with higher headquarters as well as joint and/or multinational forces via the ACA.

(a) **Coordination between the TACS and the AAGS includes the battlefield coordination detachment (BCD) in the AOC and the air component coordination element at the Army component commander's headquarters.** The ASOC is the next level of Air Force-Army integration. While the AOC provides control of air power, the ASOC provides primary control of air power in support of the Army. Integration then continues down through the Air Force component liaisons aligned with land combat forces.

(b) The ASOC's primary mission is to provide direction and control of air operations directly supporting Army ground forces. The ASOC will coordinate and assist with airspace requirements with the Army AC2 element. While Army AC2 elements normally control air assets organic to maneuver commanders, the ASOC normally controls all joint air allocated from the JFACC in support of the Army component.

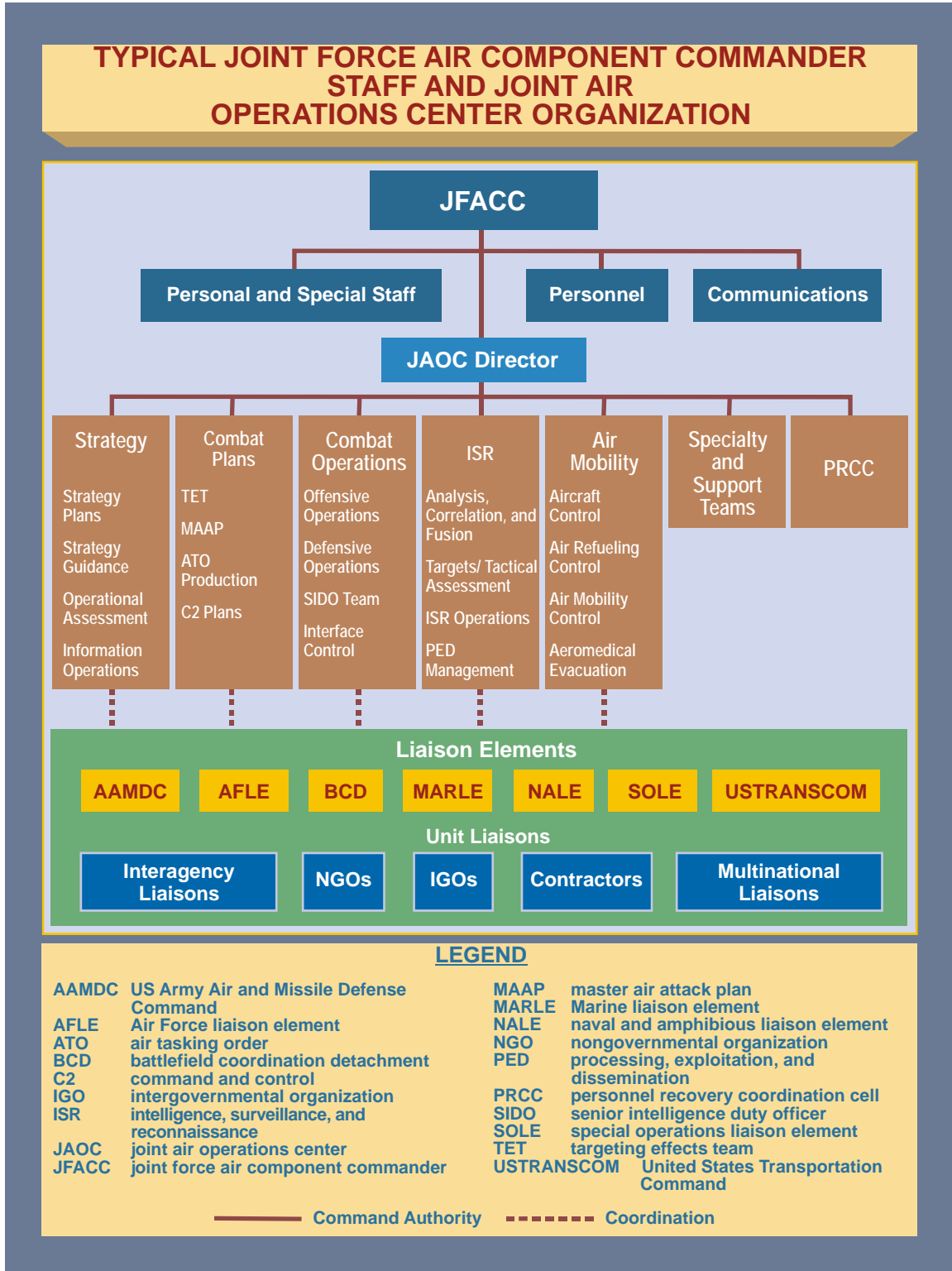


Figure II-4. Typical Joint Force Air Component Commander Staff and Joint Air Operations Center Organization

During linear operations, the ASOC normally controls airspace users short of the fire support coordination line (FSCL), while the control and reporting center normally

controls airspace beyond the FSCL. The size and shape of the ASOC's mission area will vary greatly during nonlinear operations. ASOC capabilities should be defined and planned for before operations begin. Considerations include, but are not limited to, physical location of the ASOC, terrain, and FSCL depth. Flexibility in the ASOC is vital, especially during irregular warfare. Augmenting forward TACS elements with additional planning personnel, training, and capabilities ensures the continued effective use of joint air power. The JFC, via the ACP, will determine the airspace control agency for the campaign's operational areas. The JFC may assign the airspace control area to the ACA. The ACA, under the JFC's guidance, may assign a commander an airspace control sector to accomplish a specified mission or facilitate decentralized execution by making airspace control arrangements best suited for the operation.

d. **Navy. The NTACS** is the principal air control system afloat for amphibious air operations. The NTACS is comprised of the Navy tactical air control center (TACC), tactical air direction center, and helicopter direction center. The Navy TACC is the primary air control agency within the amphibious operations area from which all air operations supporting the amphibious task force are controlled. The **maritime operations center (MOC)** provides the commander (numbered fleet commander, Navy component commander [NCC], or joint force maritime component commander [JFMCC]) with a functionally organized staff and C2 systems, to include collaborative air planning tools such as the theater battle management core system (TBMCS). Operational level air planning occurs in the MOC. The MOC conducts planning for naval strike, air interdiction, Tomahawk land attack missile, naval surface fire support, missile defense, maritime patrol and reconnaissance aircraft operations, and PR missions. Maritime air operations' planning is collaborative involving the MOC, the JAOC, and Navy task force commanders and other subordinate staffs. The JFMCC/NCC provides overall operational level guidance and planning. Tactical air planning is conducted largely by subordinate forces at sea.

e. **Marine Corps.** The MACCS consists of various air C2 agencies designed to provide the Marine air-ground task force (MAGTF) aviation combat element (ACE) commander with the ability to monitor, supervise, and influence the application of Marine aviation's six functions: anti-air warfare; offensive air support; assault support; electronic warfare; air reconnaissance; and, control of aircraft and missiles. The Marine Corps force's focal point for tasking and exercising OPCON over Marine Corps aviation is the Marine Corps tactical air command center (TACC), which performs similar duties for organic Marine Corps aviation to those that the AOC performs for Air Force component operations. The direct air support center (DASC) is the principal air control agency responsible for the direction of air operations that support Marine ground forces. It functions in a decentralized mode of operation, but is directly supervised by the Marine TACC. The DASC is roughly equivalent to the Air Force's ASOC. The tactical air operations center, subordinate to the Marine TACC, is the principal air defense agency in the MAGTF and provides real time surveillance, direction, positive control, and navigational assistance for friendly aircraft.

6. Joint Force Air Component Command Organization

a. JFACC

(1) The JFACC should establish a close working relationship with the JFC to ensure the optimum employment of joint air power. This working relationship should extend through the JFC and JFACC staffs, as well as the other component staffs that play a crucial role in supporting the JFC with air power capabilities. **The JFACC will normally operate from a JAOC.** The JAOC and the JFACC's staff should be manned with subject matter experts who reflect the capabilities/forces available to the JFACC for tasking and include appropriate component representation. This representation will provide the JFACC with the knowledge and experience required. JFACC staff billets requiring specific expertise or individuals should be identified, staffed accordingly, trained, and employed during peacetime exercises to ensure their preparedness for military operations. To be most effective, the JFACC should incorporate appropriate component representation throughout the JAOC and staff, rather than just limiting them to a liaison position.

(2) **JAOC Organization.** The JAOC is structured to operate as a fully integrated command center and should be staffed by members of all participating components, to include key staff positions, to fulfill the JFACC's responsibilities. A JAOC provides the capability to plan, coordinate, allocate, task, execute, monitor, and assess the activities of assigned or attached forces. Through the JAOC, the JFACC monitors execution of joint air operations and directs changes as the situation dictates. As the lead C2 mechanism of the TAGS, the JAOC should have secure and redundant communications with operations, logistics, weather, and intelligence centers, higher and lateral headquarters, as well as subordinate units to preclude degradation in its ability to control joint air forces. **JAOC organizations may differ. Elements that should be common to all JAOCs are the strategy division (SD), combat plans division (CPD), ISR division, air mobility division (AMD), and combat operations division (COD).** Divisions, cells, or teams within the JAOC should be established as needed (see Appendix F, "Joint Air Operations Center Divisions and Descriptions," for JAOC divisions and descriptions). The JAOC director focuses on integrating the planning, coordinating, allocating, tasking, executing, and assessing tasks and coordinates with the director of mobility forces (DIRMOBFOR) to meet the airlift and tanker priorities. Planning future joint air operations and assessing the effectiveness of past operations is usually the responsibility of the SD, while the CPD is usually devoted to near-term planning and drafting of the daily ATO. Execution of the daily ATO is carried out by the COD and closely follows the action of current joint operations, shifting air missions from their scheduled times or targets, and making other adjustments as the situation requires. The AMD is normally responsible for integrating intertheater and intratheater airlift, aerial refueling, and aeromedical evacuation (AE) into air plans and tasking orders, and for providing liaison with United States Transportation Command (USTRANSCOM). An ISR division matches collection requirements with integrated ISR assets. Figure II-5 shows a typical organization of the JFACC's staff and the JAOC. Each of the JAOC's major activities relies on expertise from **liaisons** (e.g., BCD, AAMDC liaison team, naval

and amphibious liaison element [NALE], Air Force liaison element [AFLE], special operations liaison element [SOLE], Marine liaison element [MARLE]) to coordinate requests or requirements and maintain a current and relevant picture of the other

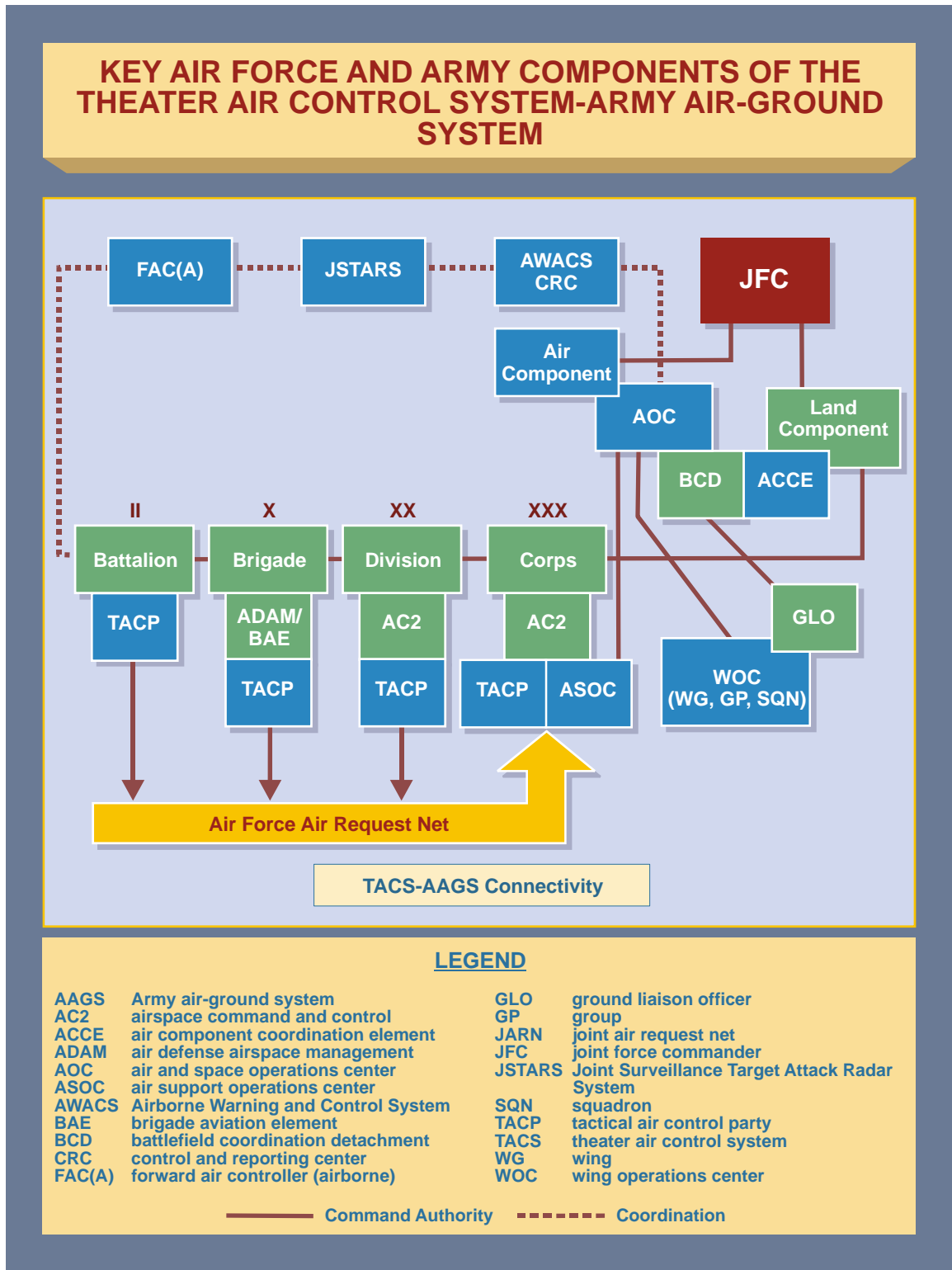


Figure II-5. Key Air Force and Army Components of the Theater Air Control System-Army Air-Ground System

component operations. For more on liaisons, see Appendix G, “Liaison Elements within the Joint Air Operations Center.”

For further detail on air mobility, see Chapter III, “Planning and Execution of Joint Air Operations,” paragraph 8, “Air Mobility Considerations,” and JP 3-17, Air Mobility Operations.

(a) **Functional Area and Mission Experts.** Functional area experts (such as intelligence, meteorological and oceanographic, logistics, space operations, legal, airspace, plans, and communications personnel) provide the critical expertise in support, plans, execution, and assessment functions. Mission experts in air-to-air, air-to-ground, ground-to-air, information operations (IO), reconnaissance, air refueling, PR, and other areas provide the technical warfighting expertise required to plan for joint air operations and employ capabilities/forces made available by the components. Functional and mission experts from all components will provide manning throughout the JAOC and at all levels of command, and may be organized in special teams.

(b) **Preparation.** For each specific operation, the **nucleus of the JFACC staff should be trained in joint air operations and be representative of the joint force.** Staff augmentation with manning as identified above ensures joint representation throughout the JAOC. The JFACC, in coordination with other component commanders, will determine specific manning requirements based on the size and scope of the operation, force list, and personnel availability.

(c) Finally, **the role of intelligence is extremely important** and is an integral part of the daily functions of the JAOC. Intelligence personnel monitor and assess adversary capabilities and intentions, especially weapons of mass destruction (WMD) threats, and provide assistance in target, weapon, fuse, and platform selection, including UA recommendations, and WMD response. In coordination with the SD’s operational assessment team, they also conduct an assessment of the effectiveness of combat operations and provide an up-to-date picture of the adversary, expected adversary operations, and the status and priority of assigned targets to assist in execution day changes.

(3) **The JFACC may establish one or more joint air component coordination elements (JACCEs) with other commanders’ headquarters to better integrate joint air operations with their operations.** When established, **the JACCE is a component level liaison that serves as the direct representative of the JFACC.** A JACCE is normally made up of the liaison element(s) of the Service designated to provide the JFACC (see paragraph 8, “Liaisons”). The JACCE does not perform any C2 functions and the JACCE director does not have command authority over any air forces. The JACCE facilitates the integration of joint air power by exchanging current intelligence, operational data, support requirements, and by coordinating the integration of JFACC requirements for ACMs, fire support coordination measures, PR, and CAS. JACCE expertise should include plans, operations, ISR, space, airspace management, air mobility, and administrative and communications support.

See Appendix H, “The Joint Air Component Coordination Element,” for JACCE responsibilities and notional organization.

(4) **Tasking Component Forces**

(a) The JFC has the authority to provide a component’s forces for joint air tasking. The JFC determines what air capabilities/forces to make available for conducting joint air operations, in consultation with component commanders. Typically, component commanders will make agreements on contributions to the joint air effort without JFC intervention unless an agreement cannot be reached.

(b) Forces are tasked by the JFACC based on the JFC’s approval of the JFACC’s air apportionment recommendation (e.g., CAS, interdiction). In the case of a theater JFACC, the GCC will decide what air capabilities/forces are provided to each subordinate JFC. The air apportionment decision referenced here is made by each subordinate JFC.

(c) Component forces must comply with the ROE, ACP, ACO, AADP, and SPINS. Some smaller (Group 1) unmanned aircraft systems (UASs) may not be included on the ATO based on use and mission requirements. The inclusion of air assets in the ATO does not imply any change in command relationships or tasking authority over them, nor does it restrict component commanders’ flexibility to respond to the dynamics of the operational environment.

(d) **Army forces (ARFOR)** are normally employed as part of the combined arms team. Army aviation, air defense, fires (e.g., Army Tactical Missile System), and other forces made available to the JFACC are in a support relationship. The integration of ARFOR and other component airspace users, to include UASs and fires, requires detailed planning and coordination throughout the operational area.

(e) **Marine Corps Aviation Assets.** The primary mission of the MAGTF ACE is to support the MAGTF ground combat element. During joint operations, the MAGTF aviation assets will normally be in support of the MAGTF mission. The MAGTF commander will make sorties available to the JFC, for tasking through the JFACC, for air defense, long range air interdiction, and long-range reconnaissance. Sorties in excess of MAGTF direct support requirements will be provided to the JFC for tasking through the JFACC for the support of other components of the joint force or the joint force as a whole. NOTE: Sorties provided for air defense, long-range interdiction, and long-range reconnaissance are not “excess” sorties and will be covered in the ATO. These sorties provide a distinct contribution to the overall joint force effort. The JFC must exercise integrated control of air defense, long-range reconnaissance, and interdiction aspects of the joint operation or theater campaign. Excess sorties are in addition to these sorties.

(f) **Navy Aviation Assets.** Navy assets normally are retained for employment in support of the assigned joint maritime missions, including sea control, deterrence, and maritime power projection within the operational area. Assets include sea- and land-based naval aircraft. Navy assets not required for assigned joint missions or for fleet defense will normally be made available for tasking via the joint air tasking process.

(g) **Air Force Air and Space Assets.** The air and space expeditionary task force (AETF) is the primary means by which the Air Force presents forces to a JFC. AETFs are sized and tailored to meet the JFC's specific mission requirements. Air Force assets include bombers, specialized reconnaissance and C2 air and ground platforms and centers, air mobility aircraft, single and multi-role fighters, and UASs. Air Force capabilities also include intertheater and intratheater airlift; air to air refueling; ISR; PR/combat search and rescue; and extensive space assets. To plan, execute, and assess air and space operations, the Air Force has developed tailored Air Force AOCs that can be networked to provide the full range of Air Force air, space, and cyberspace capabilities to a joint force. These AOCs may be further tailored to address changing operational environments, and may be augmented by operations centers anywhere else in the world. With the exception of certain national assets, special operations, and intertheater air mobility assets, the COMAFFOR will normally have OPCON over Air Force assets in the operational area. In most cases, all Air Force forces assigned aircraft are made available for employment as directed by the JFACC.

(h) **Special Operations Forces (SOF) Aviation Assets.** The joint force special operations component commander (JFSOCC)/commander, joint special operations task force (CDRJSOTF) may designate a joint special operations air component commander (JSOACC) responsible for planning and executing joint special operations air activities. If a JSOACC has not been designated, then SOF air power is usually controlled by its Service component within the joint force special operations command. When SOF aviation assets are employed primarily in support of conventional air operations, the JFC may make these sorties available to the JFACC for tasking. Command relationships, launch authority, and other coordination measures between the components should specifically address situations where the same SOF aviation assets may be tasked to conduct missions for both components during the same ATO period. Whether operating autonomously or in conjunction with conventional forces, special operations must be integrated into, and closely coordinated with, other air operations conducted in theater. In order to coordinate and deconflict operations, the JFSOCC and the JFACC exchange liaison teams.

1. The JFSOCC/CDRJSOTF normally provides the JAOC a SOLE to coordinate, deconflict, and integrate special operations air, surface, and subsurface operations with conventional air operations. Additionally the SOLE ensures coordination of SOF operations in the JFACC's ATO and ACO. The SOLE director serves as the personal liaison of the JFSOCC/CDRJSOTF to the JFACC. This individual is not in the SOF chain of command, thus command authority for the mission tasking, planning, and execution of SOF units remains with the JFSOCC/CDRJSOTF. The SOLE director

places liaison officers (LNOs) in divisions of the JAOC to integrate with the JAOC staff. The type of expertise sourced and provided depends on the type of operations. SOLE staff members report directly to the SOLE director while serving in the SOLE.

2. The JFACC provides the JFSOCC/CDRJSOTF or other SOF organizations a JACCE. The JACCE is responsible to the JFACC and coordinates with the SOF organization, representing the JFACC's needs in either a supporting or supported role.

For more information on special operations and the SOLE, see JP 3-05, Doctrine for Joint Special Operations and JP 3-05.1, Joint Special Operations Task Force Operations.

(5) JFACC Options

(a) **Designated JFACC for each JFC subordinate to the GCC.** A GCC normally establishes a subordinate JTF to conduct operations, and forces are normally attached as needed, with specification of OPCON to the subordinate JFC. This option will place dedicated air assets and independent C2 capability under the OPCON of the JFC for whom they are performing the mission. It provides unity of command over the forces employed within the assigned JOA and greater direct control and predictability as to which air assets are available.

(b) **Theater JFACC.** A GCC may establish multiple JTFs within the area of responsibility (AOR), but decide to retain C2 of joint air forces at the GCC level. Joint air forces will be controlled to support the multiple JTF commanders according to the JTF commanders' objectives and the GCC's AOR- wide priorities. In this situation, joint air forces are controlled at the theater level, under the direction of the "theater JFACC," subordinate to the GCC. The theater level JFACC provides flexibility in managing limited air assets to meet the requirements of the GCC and multiple JTFs.

1. The theater JFACC will be the supporting commander to the GCC's subordinate JTF commanders' joint air operations within their respective JOAs. Per JP 1, *Doctrine for the Armed Forces of the United States*, an establishing directive should be promulgated to clearly delineate support command relationships. Unless limited by the establishing directive, the supported JTF commanders will have the authority to exercise general direction of the supporting effort. (General direction includes the designation and prioritization of targets or objectives, timing and duration of the supporting action, and other instructions necessary for coordination and efficiency.)

2. The theater JFACC, as the supporting commander, determines the forces, tactics, methods, procedures, and communications to be employed in providing this support. The JFACC will advise and coordinate with the supported JTF commanders on matters concerning the employment and limitations (e.g., logistics) of such support, assist in planning for the integration of such support into the supported JTF commanders' efforts as a whole, and ensure that support requirements are appropriately communicated within the JFACC's organization. When the JFACC cannot fulfill the needs of the

supported JTF commander, the GCC will be notified by either the supported JTF commander or JFACC. The GCC is responsible for determining a solution. For their operations, these JTF commanders – as JFCs - will exercise approval authority for products normally generated for “JFC approval” (including products generated by the theater JFACC for their JOA).

3. The theater JFACC may deploy one or more JACCEs to the JTF headquarters and other component headquarters as needed to ensure they receive the appropriate level of joint air support (see Appendix H, “The Joint Air Component Coordination Element,” for a more detailed description of JACCE). The JACCE will provide on-hand air expertise to the JTF commanders and the direct link back to the theater JFACC and the JAOC.

(c) Between these two options presented there can be other potential organizational variations. While it is impossible to assemble a complete list of all potential C2 arrangements, two additional options that commanders may consider follow.

1. **Multiple JFACCs sharing a Theater JAOC.** Typical arrangements of this nature have been driven by unforeseen, short-term incidents outside the scope of the original JAOC establishment. In this case, sufficient manning and infrastructure must be in place to support both individual JFACC missions prior to establishing such an arrangement.

2. **Theater JFACC or JTF’s JFACC to operate concurrently with a JSOACC assigned to a CDRJSOTF.** This is a possible arrangement, although not commonly used, when a joint special operations task force (JSOTF) is formed and air assets not being used at a given time by the CDRJSOTF may be made available to the JFACC for tasking.

b. The options discussed above contain combatant commander (CCDR)/subordinate relationships. Approval authority is inherent in command; therefore, it is imperative subordinate JFCs exercise approval authority over those processes affecting operations within their JOAs regardless as to whether the products are developed by resources allocated to the command or by other headquarters. This includes, but is not limited to: air apportionment decisions, targeting products, joint air estimates, JAOP, and ACPs/ACOs/AADPs.

7. Joint Force Staff Option

In operations of limited scope, duration, or complexity, or in which air operations are a relatively small aspect of the overall joint force, the JFC may plan, direct, and control joint air operations with the assistance of the JFC staff. In this situation, the JFC would retain command authority and responsibility and would normally request augmentation from appropriate components to perform the C2 air function and assist in planning and coordinating joint air operations. In the joint force staff option all previously discussed

JFACC responsibilities will be accomplished by the joint force staff as directed by the JFC.

a. The JFC staff operates out of the joint operations center (JOC). Under the JFC staff option, the JOC also functions as the C2 node for joint air operations. The composition of a joint staff should reflect the composition of the subordinate joint forces to ensure that those responsible for employing those forces have a thorough knowledge of their capabilities and limitations. The presence of liaisons on a single-Service staff does not transform that Service staff into a joint staff. The joint staff should be composed of appropriate members in key positions of responsibility from each Service or functional component having significant forces assigned to the command. The same general guidelines for joint staffs apply to multinational operations. Key staff positions ought to be a representative mix of US and multinational officers with shared responsibilities and trust.

b. **JFC Staff Authority and Responsibilities.** The JFC staff derives its authority from the JFC. JFC staff relationships and responsibilities must be specified early in the planning process. Although command authority for tasking subordinate commanders is retained by the JFC, the JFC may assign responsibility for coordinating joint air operations to a staff directorate (e.g., J-3), a specific staff officer (e.g., J-3 air officer), or a special staff.

(1) **Planning.** The JFC staff prepares the JAOP to support the JFC's objectives. They may also prepare the ACP, AADPs, and DAL.

(2) **Coordination.** The JFC staff coordinates joint air activities with other operations in the operational area. As appropriate, subordinate commanders and coordinating agencies furnish liaison elements and augmentation personnel to the JFC staff to coordinate with the joint force.

(3) **Execution.** The JFC staff monitors the execution of joint air operations by subordinate commanders tasked through the ATO. This may include redirecting sorties, as directed by the JFC, to accomplish joint force objectives.

(4) **Supporting Operations.** Joint air operations may require support (e.g., suppression of enemy air defenses, ground-based air defense) from resources other than aircraft. The JFC may direct components to support joint air operations with assets, capabilities, or forces, in addition to the air capabilities/forces provided.

8. Liaisons

a. In addition to the JFC and his staff, other component commanders and their staffs require continuous and ready access to the JFACC and the JFACC's staff. Principle means of accomplishing this is through personal contact, the established communications and information support system, and liaison personnel. These **liaisons work for their respective component commanders and work with the JFACC and staff.** Each

component normally provides liaison elements (BCD, SOLE, NALE, MARLE, AFLE, AAMDC, and others, as appropriate) that work within the JAOC. These liaison elements consist of personnel who provide component planning and tasking expertise and coordination capabilities. They help integrate and coordinate their component's operations with joint air operations.

See Appendix G, "Liaison Elements Within the Joint Air Operations Center."

b. Component Liaisons. Component liaisons serve as conduits for direct coordination between the JFACC and their respective component commanders. Functional or Service component commanders should delegate appropriate authority to their liaisons to effectively participate in the JAOC environment and processes. Component commanders should determine liaison responsibilities and authorize direct coordination with specified commanders and staff. They must be equipped and authorized to communicate directly with their respective component commander. The liaisons have the responsibility of presenting component perspectives and considerations regarding planning and executing joint air operations. Component liaisons must be familiar with the details of all component air, surface, and subsurface missions to coordinate their impact on joint air operations and its impact upon them.

c. Other Liaisons. IGOs, OGAs, NGOs, and contractors conduct activities near or in areas of military operations. CDRs must be cognizant of these organizations and their actions. To the extent possible, commanders should ensure that these organizations' efforts and military efforts are coordinated and complementary (or at least not in conflict). Commanders should consider establishing coordination and mutual support mechanisms, as needed, to eliminate or mitigate conflict and support US goals in the region. Liaisons from these organizations to the JFACC may be appropriate. Multinational partners, particularly in operations being conducted in conjunction with or in close proximity to those of allied nations, may provide liaisons that work with the JFACC to ease coordination between forces. They work with the JFACC to coordinate the activities of their sending organizations. In addition, the JFACC should consider sending liaisons to appropriate organizations, for example, coalition intelligence collection, air defense, homeland defense, and airborne related functions.

9. Joint Force Air Component Commander Basing and Transition

a. Procedures for joint air operations are designed to exploit the flexibility of air power to achieve joint force objectives while providing support to component operations. Joint air operations scenarios may vary, and each scenario requires extensive planning when transition of JFACC responsibilities is necessary.

b. Land-based JFACC. In large-scale air operations, land-based JFACCs and JAOCs are normally desired because of the enhanced logistics and communications provided by additional equipment and workspaces that may not be available on sea-based facilities.

c. **Sea-based JFACC.** The JFACC and JAOC may be sea-based when any one of the following conditions are present:

(1) Maritime forces provide the preponderance of air assets and have the organizational construct, operating experience, and management functions capability to effectively plan, task, and control joint air operations.

(2) Land-based facilities or sufficient infrastructure does not exist.

(3) A secure land-based area is not available and ground support forces are forced to withdraw.

d. **JFACC Transition.** Effective joint air operations planning must contain provisions to transition JFACC responsibilities between components.

(1) **Planned Transition.** The JFACC should develop a plan for transition of JFACC duties to another component or location. Planned JFACC transitions are possible as a **function of buildup or scale down of joint force operations.** During transition of JFACC responsibilities, the component passing responsibilities should continue monitoring joint air planning, tasking, and control systems, and remain ready to reassume JFACC responsibilities until the gaining component has achieved full operational capability.

(2) **Unplanned Transition.** During unplanned shifts of JFACC responsibility, as a possible result of battle damage or major C2 equipment failure, a smooth transition is unlikely. Therefore, **the JFC should predesignate alternates** (both inter- and intracomponent) and establish preplanned responses/options to the temporary or permanent loss of primary JFACC capability. Frequent backup and exchange of databases is essential to facilitate a rapid resumption of operations should an unplanned transition occur.

(3) **Transition Events.** The following events may cause the JFACC responsibilities to shift:

(a) Coordination requirements, related to ATO planning and execution, exceed the component capability.

(b) Buildup or relocation of forces shifts preponderance of the air capabilities/forces and the ability to effectively plan, task, and control joint air operations to another component commander; and the JFC decides that the other component is in a better position (location, C2 capability, or other considerations) to accomplish the JFACC responsibilities.

(c) C2 systems become unresponsive or unreliable.

(4) **Considerations.** Considerations to aid in JFACC transition planning and decisions include:

(a) Continuous, uninterrupted, and unambiguous guidance and direction for joint air operations must be the primary objective of any JFACC transition.

(b) Appropriate communications system capabilities to ensure shift of JFACC duties is as transparent to the components as possible.

(c) Specific procedures for coordinating and executing planned and unplanned shifts of JFACC should be published in the JAOP.

(d) The relieving component must have adequate communications, connectivity, manning, intelligence support, and C2 capability prior to assuming JFACC responsibilities.

(e) The ability to assume control of, plan, publish, and disseminate as a minimum the following: current ATO, SPINS, ACO, joint integrated prioritized target list (JIPTL), force disposition, adversary situation, and order of battle.

(f) The JFC's objectives to conduct supporting joint air operations.

(g) Established timely, reliable, and secure communications links with all appropriate coordination cells to facilitate continuous and dynamic exchange of information.

(h) Complete familiarity with the AADP and ACPs.

(i) Complete and current databases to expedite the transition.

e. **Transition of C2 for Joint Air Operations.** The JFC may choose to assign C2 of joint air operations to a JFACC when the duration and scope of joint air operations exceed the JFC's span of control. Additionally, the JFC may transfer designated mission experts and functional area augmentees from the JFC staff to the JFACC's JAOC to assist in the transition and coordination of joint air operations. Conversely, a transition from JFACC to JFC staff may also be directed when the JFC determines that operational requirements warrant such a change.

10. Communications System

a. **The JFACC is responsible for identifying and validating joint air requirements that affect the JFC's mission and allow accomplishment of the JFC's directives.** The C2 and communications architecture should be distributed by the operations task link message.

b. The ability to exchange information via reliable secure communications with the JFC, joint force staff, and other component commanders is key to the successful integration of the joint air effort. Planning should address the following areas:

(1) **Data exchange requirements** should be promulgated as early as possible to ensure that each component can meet interoperable interface requirements. Every effort should be made to confirm data exchange connectivity requirements during planning.

(2) Planning for all information exchange requirements and procedures **should consider all elements of information and cyberspace operations.**

(3) **The best mix of computer-aided systems should be available for data transmission.** The JAOC and liaison elements depend on secure, reliable, beyond-line-of-sight communications and data exchange equipment in order to respond to joint force requirements. For example, the TBMCS is often used. The use of ATO generation and dissemination software portions of TBMCS has been standardized. This ATO feature allows the JAOC to be interoperable with other force-level Service systems.

CHAPTER III

PLANNING AND EXECUTION OF JOINT AIR OPERATIONS



“It is improbable that any terrorization of the civil population which could be achieved by air attack would compel the government of a great nation to surrender. In our own case, we have seen the combative spirit of the people roused, and not quelled, by the German air raids. Therefore, our air offensive should consistently be directed at striking the bases and communications upon whose structure the fighting power of his armies and fleets of the sea and air depends.”

Winston Churchill (1917)

SECTION A. PLANNING JOINT AIR OPERATIONS

1. Joint Air Operations Planning

This discussion reflects that the JFC has designated a JFACC. Planning for joint air operations begins with **understanding the JFC’s mission and intent**. The JFC’s **estimate** of the operational environment and articulation of the objectives needed to accomplish the mission form the basis for determining components’ objectives. The JFACC uses the JFC’s mission, commander’s estimate and objectives, commander’s intent, CONOPS, and the components’ objectives to develop a course of action (COA). When the JFC approves the JFACC’s COA, it becomes the basis for more detailed joint air operations planning—expressing what, where, and how joint air operations will affect the adversary or current situation. The JFACC’s daily guidance ensures that joint air operations effectively support the joint force objectives while retaining enough flexibility in execution to adjust to the dynamics of military operations (see Figure III-1).

2. The Joint Air Estimate

The joint air estimate is described as a process of reasoning by which the air component commander considers all the circumstances affecting the military situation and decides on a COA to be taken to accomplish the mission. The joint air estimate is often produced as the culmination of the COA development and selection stages of the joint operation planning process described below. The joint air estimate reflects the JFACC’s analysis of the various COAs that may be used to accomplish the assigned mission(s) and contains the recommendation for the best COA. Figure III-2 shows a joint air estimate overview format.

See Appendix B, “Sample Joint Air Estimate of the Situation,” for more information.

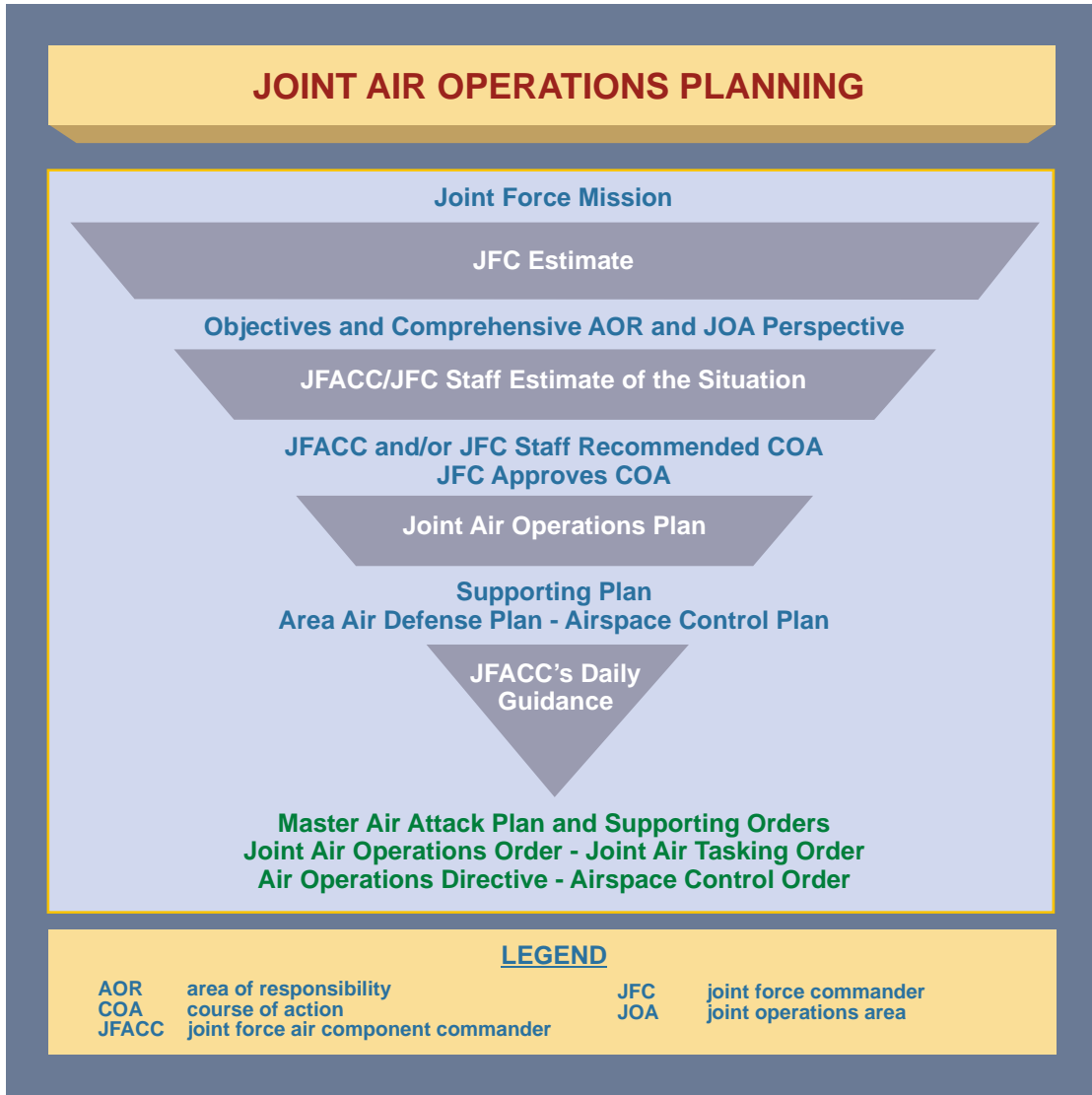


Figure III-1. Joint Air Operations Planning

3. The Joint Operation Planning Process for Air

The JFACC is responsible for planning joint air operations and uses the joint operation planning process for air (JOPPA) to develop a JAOP that guides employment of the air capabilities and forces made available to accomplish missions assigned by the JFC.

a. **JFACC Planning Responsibilities.** The JFACC's role is to plan joint air operations. In doing so, the JFACC provides focus and guidance to the JAOC staff. The amount of direct involvement depends on the time available, preferences, and the experience and accessibility of the staff. The JFACC uses the entire staff during planning to explore the full range of adversary and friendly COAs and to analyze and compare friendly air capabilities with the adversary threat. **The JFACC must ensure that**



Figure III-2. Joint Air Estimate

planning occurs in a collaborative manner with other components. Joint air planners should meet on a regular basis with the JFC’s planners and with planners from other joint force components to integrate operations across the joint force. Planning is a continuous process and only ends with mission accomplishment.

b. **The JAOP is the JFACC’s plan for integrating and coordinating joint air operations** and encompasses air capabilities and forces supported by, and in support of, other joint force components. The JFACC’s planners must anticipate the need to make changes to plans (e.g., sequels or branches) in a dynamic and time-constrained environment. Planners should include representatives from all components providing air capabilities or forces to enable their effective integration. Expertise requirements may include, but are not limited to, those listed in Figure III-3.

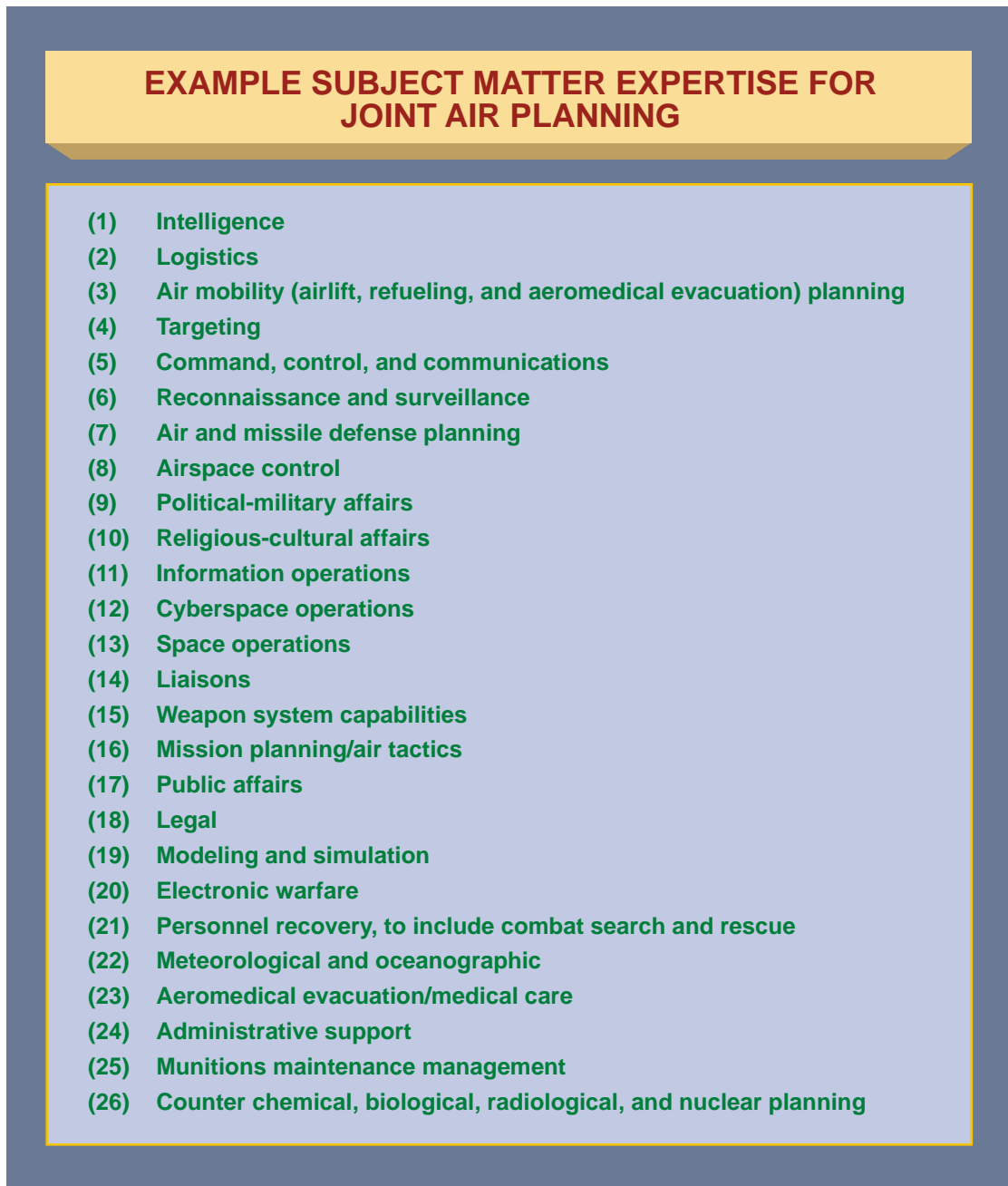


Figure III-3. Example Subject Matter Expertise for Joint Air Planning

c. **JOPPA is a seven-step process similar to the joint operation planning process** found in JP 5-0, *Joint Operation Planning*. JOPPA culminates in the production of the JAOP and supporting plans and orders. JOPPA may be accomplished during contingency planning, producing JAOPs that support OPLANs or concept plans. JOPPA may also be accomplished as part of crisis action planning or in conjunction with other operation planning. While the steps are presented in sequential order, work on them can be concurrent or sequential. Nevertheless, the phases are integrated and the products of

each phase should be checked and verified for coherence and consistency. Figure III-4 illustrates the seven steps.

(1) Step 1. Initiation

(a) Planning is usually initiated by direction of a JFC, but the JFACC may initiate planning in anticipation of a planning requirement not directed by higher authority, but within the JFACC's authority. Joint air operations should be coordinated with space and cyberspace operations. Military air options are normally developed in combination with the other military and nonmilitary options so the JFC can appropriately respond to a given situation.

(b) The JFACC and staff perform an assessment of the initiating directive to determine how much time is available until mission execution, the current status of

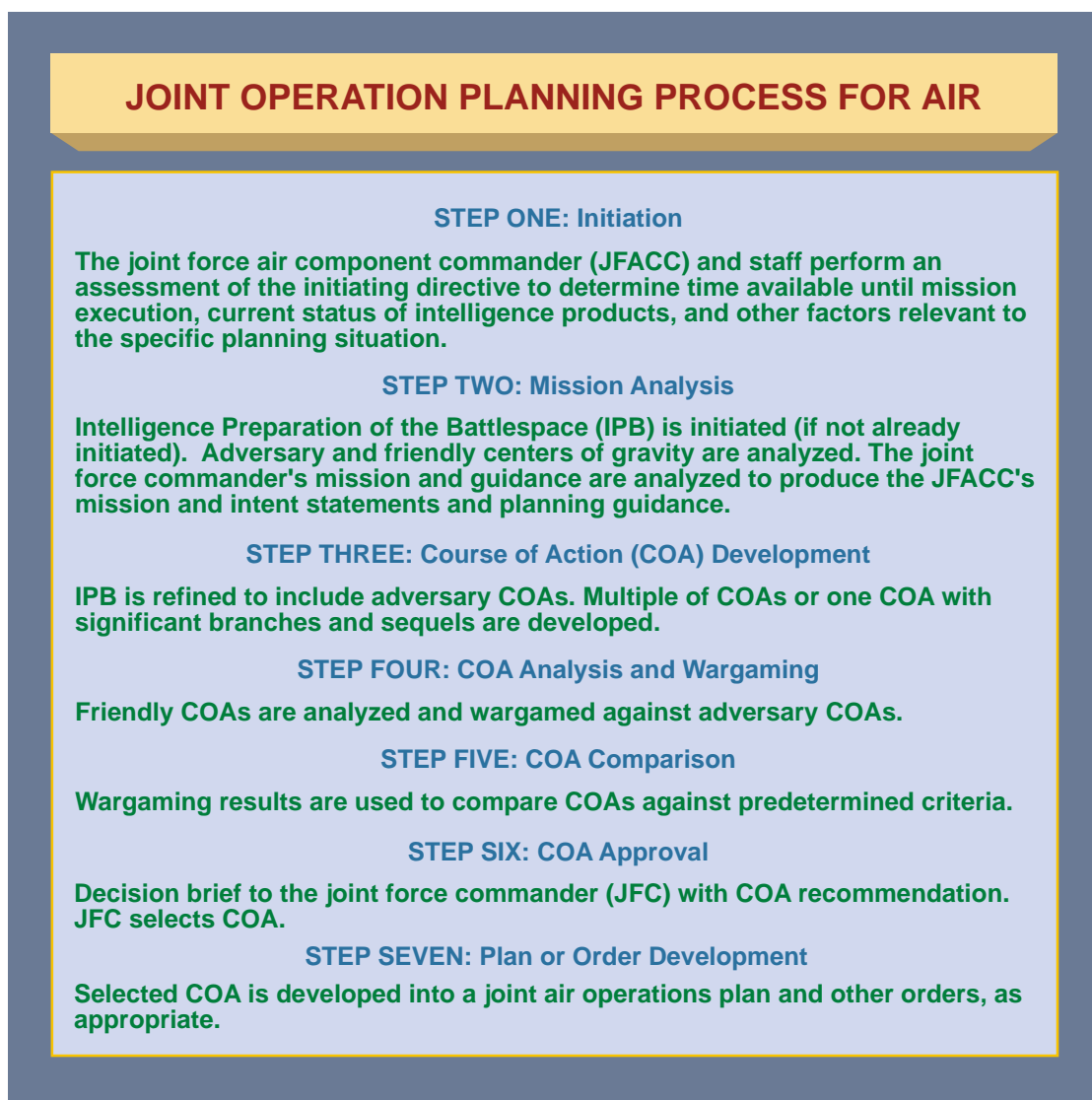


Figure III-4. Joint Operation Planning Process for Air

intelligence products and staff estimates, and other relevant factors that influence the planning situation. The JFC and JFACC typically provide initial guidance that may specify time constraints, outline initial coordination requirements, authorize movement of key capabilities within the commanders' authority, and direct other actions as necessary. The JFACC may produce an initial mission statement during this step. Refer to Appendix A, "Sample Mission Statement and Commander's Intent," to see a sample JFACC mission statement and commander's intent.

(2) **Step 2. Mission Analysis**

(a) Mission analysis is critical to ensure thorough understanding of the task and subsequent planning. It results in the JFACC's final mission statement that describes the joint air component's essential tasks. It should include the "who, what, when, where, and why" for the joint air operation, but seldom specifies "how." (See Figure III-5.) At the end of mission analysis, the JFACC should issue his intent for the overall joint air operation, that is, the JFACC's contribution to the JFC's military end state. The JFACC's intent should express the end state to be produced by joint air operations and the purpose for producing them. It should also include the JFACC's assessment of where and how much risk is acceptable during the operation. (See Figure III-6.) While the commander's intent for the overall operation is needed at the end of mission analysis, the

SAMPLE JOINT FORCE AIR COMPONENT COMMANDER'S MISSION STATEMENT

When directed, the joint force air component commander (JFACC) will conduct joint air operations to deter aggression and protect deployment of the joint force.

Should deterrence fail, the JFACC, on order, will gain and maintain air superiority to enable joint operations within the operational area. Concurrently, the JFACC will support the joint force land component commander (JFLCC) in order to prevent enemy seizure of vital areas (to be specified).

On order, the JFACC, in conjunction with the JFLCC and joint force maritime component commander (JFMCC), will render enemy fielded military forces combat ineffective and prepare the operational environment for a counteroffensive. Concurrently, the JFACC will support the JFMCC in gaining and maintaining maritime superiority. The JFACC, on order, will support JFLCC and joint force special operations component commander (JFSOCC) ground offensive operations, degrade the ability of enemy national leadership to rule the country as directed, and destroy enemy weapons of mass destruction, in order to restore territorial integrity, and enemy military threat to the region, support legitimate friendly government, and restore regional stability.

Figure III-5. Sample Joint Force Air Component Commander's Mission Statement

SAMPLE JOINT FORCE AIR COMPONENT COMMANDER'S INTENT STATEMENT

- **Purpose.** The purpose of this joint air operation will be initially to deter enemy aggression. Should deterrence fail, I will gain air superiority, render enemy fielded forces ineffective with joint airpower, degrade enemy leadership and offensive military capability as directed, and support joint group and special operations forces in order to restore territorial integrity and ensure the survival or restoration of legitimate government in a stable region.
- **End State.** At the end state of this operation: Enemy military forces will be capable of limited defensive operations, will have ceased offensive action, and will have complied with war termination conditions. The succeeding state will retain no weapons of mass destruction capability; I will have passed air traffic control to local authorities, territorial integrity will be restored, and joint force air component commander operations will have transitioned to support of a legitimate and stable friendly government.

Figure III-6. Sample Joint Force Air Component Commander's Intent Statement

JAOP will eventually contain the commander's intent for each phase of the operation, and the AODs will contain the JFACC's intent for a specific ATO or period of time. Hence the commander's intent articulates a desired set of conditions for a given point in time and the purpose those conditions will support.

(b) Anticipation, prior preparation, and a trained staff are critical to timely mission analysis. Staff estimates generated during mission analysis are continually revisited and updated during the course of planning, execution, and assessment.

(c) Mission analysis includes developing a list of critical facts and assumptions. **Facts** are statements of known data concerning the situation. **Assumptions** are suppositions on the current situation or a presupposition on the future course of events, either or both assumed to be true in the absence of positive proof, necessary to enable the commander in the process of planning to complete an estimate of the situation and make a decision on the COA. Assumptions may also become commander's critical information requirements or drive the development of branch plans to mitigate the risks of a wrong assumption. Assumptions must be continually reviewed to ensure validity. Once an assumption is proven correct, it becomes a fact; or if proven incorrect, a new fact or assumption is determined. They are necessary to enable commanders to complete estimates of the situation, influence commander's critical information requirements, drive branch planning, and make decisions on COAs.

1. IPB should identify and analyze adversary and friendly centers of gravity (COGs) at the operational and tactical levels and contribute to the joint intelligence preparation of the operational environment (JIPOE). JIPOE is the analytical process used by joint intelligence organizations to produce intelligence assessments, estimates, and other intelligence products in support of the JFC's decision-making process. The process is used to analyze the physical domains; the information environment; political, military, economic, social, information, and infrastructure systems; and all other relevant aspects of the operational environment, and to determine an adversary's capabilities to operate within that environment. The IPB effort must be fully coordinated, synchronized, and integrated with the JIPOE effort of a joint intelligence center. A COG is a source of power that provides moral or physical strength, freedom of action, or will to act. In coordination with the JFC, the joint air component may focus on strategic and operational COGs as well as tactical-level details of adversary forces because air power can often directly or indirectly affect COGs through application of lethal and nonlethal force and through peaceful means.

See JP 2-01.3, Joint Intelligence Preparation of the Operational Environment, for greater detail on JIPOE.

2. The JFACC and staff prioritize the analyzed adversary and friendly critical vulnerabilities associated with COGs based on their impact on achieving the objectives most effectively, in the shortest time possible, and at the lowest cost. The analyses of **adversary and friendly** critical vulnerabilities are incorporated into the various COAs considered during COA development.

(d) The JFACC, supported by the staff, determines the joint air objectives and the specified, implied, and essential tasks. The JFACC typically includes essential tasks in his mission statement. Essential tasks are specified or implied tasks that the JFACC must perform to accomplish the mission.

(e) The JFACC and staff examine readiness of all available air capabilities and forces to determine if there is enough capacity to perform all the specified and implied tasks. **The JFACC identifies additional resources needed for mission success to the JFC.** Factors to consider include available forces (including multinational contributions), command relationships (joint force, national, and multinational), force protection requirements, ROE, law of war, applicable treaties and agreements (including existing status of force agreements), base use (including land, sea, and air), overflight rights, logistic information (what is available in theater ports, bases, depots, war reserve material, host nation support), and what can be provided by other theaters and organizations.

(f) The **end state** defines the commander's criteria for mission success. By articulating the joint air component's purpose, the JFACC provides an overarching vision of how the conditions at the end state support the joint operation and follow-on operations.

(3) **Step 3 – COA Development**

(a) COA development is based on mission analysis and a creative determination of how the mission will be accomplished. The staff develops COAs. **A COA represents a potential plan the JFACC could implement to accomplish the assigned mission.** All COAs must meet the JFACC's intent and accomplish the mission.

(b) A COA consists of the following information: what type of military action will occur; why the action is required (purpose); who will take the action; when the action will begin and how long it will last (best estimate); where the action will occur; and how the action will occur (method of employment of forces). COAs may be broad or detailed depending on available planning time and JFACC's guidance. The staff should assess each COA to estimate its success against all possible adversary COAs. The staff converts the approved COA into a CONOPS. COA determination consists of four primary activities: COA development, analysis and wargaming, comparison, and approval. Air COAs will often require input from other component commanders to synchronize them with land and maritime operations.

(c) When time is limited, the JFACC should determine how many COAs the staff will develop and which adversary COAs to address. A complete COA should consider, at a minimum:

1. The JFACC's mission and intent (purpose and vision of military end state).
2. Desired end state.
3. Commander's critical information requirements.
4. C2 structure of the operation and within the operational area.
5. Essential tasks.
6. Available logistic support.
7. Available forces.
8. Available support from agencies and organizations.
9. Transition strategies between each phase.
10. Decision points.

(d) COAs should include the following specifics:

1. Operational and tactical objectives and effects and their related tactical tasks, in order of accomplishment.

2. Forces required and the force providers.

3. Force projection concept.

4. Employment concept.

5. Sustainment concept.

(e) The speed, range, persistence, and flexibility of air assets are their greatest advantages, and their employment location and purpose may change in minutes. Air strategists and planners deal with objective sequencing and prioritization, operational phasing, employment mechanisms, and weight of effort. In some cases, there may be flexibility in how to attain the JFACC's objectives. For example, an objective may be to "destroy WMD capability," but an alternate objective may be to "destroy WMD delivery means." In addition, COAs may vary by the phase in which an objective is achieved or the degree to which an objective is achieved in each phase.

(f) Air COAs may be presented in several ways. They may be presented as text and may discuss the priority and sequencing of objectives. Air COAs may also be depicted graphically—displaying weights of effort, phases, decision points, and risk. One helpful way to depict an air COA graphically is to depict it as one or more logical lines of operations (LOOs), as described in JP 5-0, *Joint Operation Planning*. Any quantitative estimates and assessment criteria presented should clearly indicate common units of measurement in order to make valid comparisons between COAs. For example, a sortie is not a constant value for analysis—one F/A-18 sortie does not equate to one B-2 sortie. Air COAs should avoid numerical presentation. Ultimately, the JFACC will direct the appropriate style and content of the COA.

(g) The first step in COA development is to determine the measures that will accomplish the JFACC's mission and support achievement of the JFC's objectives. The framework of objectives, effects, and tasks provides a clear linkage of overall strategy to task. While the JFC normally provides operational objectives to the JFACC, they may also emerge through mission analysis or COA development, developed by the JFACC and the JAOC SD staff in consultation with the JFC. An objective should be clearly defined, decisive, and state an attainable goal. JFACC support to other components should also be expressed in terms of objectives. Resulting objectives can then be prioritized with other JFACC objectives in accordance with the JFC's CONOPS. **Supporting objectives should describe what aspect of the adversary's capability the JFC or other component wants to affect.** For example, the joint force land component commander's (JFLCC's) attack may require disrupting the adversary's operational reserve. Supporting JFACC objectives could be expressed as, "render adversary's operational reserve unable to conduct counterattacks on JFLCC forces" or, "destroy adversary's operational reserve's offensive capability." Clearly defined objectives

prevent confusion over what the force is trying to accomplish and reduce the risk of mission failure.

(h) Commanders plan joint operations by developing objectives supported by measurable effects and assessment indicators. Analysis of effects (desired and undesired) and determination of measures of effectiveness during planning for joint air operations is usually conducted by the JAOC strategy plans and operational assessment teams, assisted by all other planning elements of the JAOC.

(i) To clarify, objectives *prescribe* friendly goals. Effects *describe* system behavior in the operational environment. Desired effects are the conditions related to achieving objectives. Tasks, in turn, *direct* friendly action. Objectives and effects are assessed through measures of effectiveness (MOEs). Empirically verifiable MOEs may help ensure the JFACC knows when the desired ends have been achieved. Accomplishment of friendly tasks is assessed through measures of performance (MOPs). MOEs help answer questions like, “are we doing the right things, or are alternative actions required?” MOEs also help focus component operational assessment efforts, inform processing, exploitation, and dissemination (PED) priorities, and identify ISR requirements. MOPs help answer questions like, “are we doing things right: were the tasks completed to standard?” Figure III-7 depicts the relationship of objectives, effects, and tasks and their associated assessment measures.

(j) Once strategists and planners define the joint air objectives and supporting effects and tasks, they further refine potential air COAs based on the objective priority, sequence, phasing, weight of effort, and matched resources. This is one method of differentiating COAs. Other methods include varying time available, anticipated adversary activities, friendly forces available, and higher-level guidance. For air planning, a single COA may be developed with several branches and sequels that react to possible adversary activities.

(k) Planners should determine the validity of each air COA based on suitability, feasibility, acceptability, distinguishability, and completeness.

(l) The relationship between resources and COA development is critical. **COA development must take into account the resource constraints of the joint force at large** (see Figure III-8). Competing requirements for limited airlift will often result in deployment orders less than ideal for all components but optimal for the joint force as a whole. The JFC must ensure the time-phased force and deployment data (TPFDD) reflects the priorities and requirements of the joint force. Planners must ensure the COA developed adheres to deployment considerations across the force and does not assume away potential mobility pitfalls.

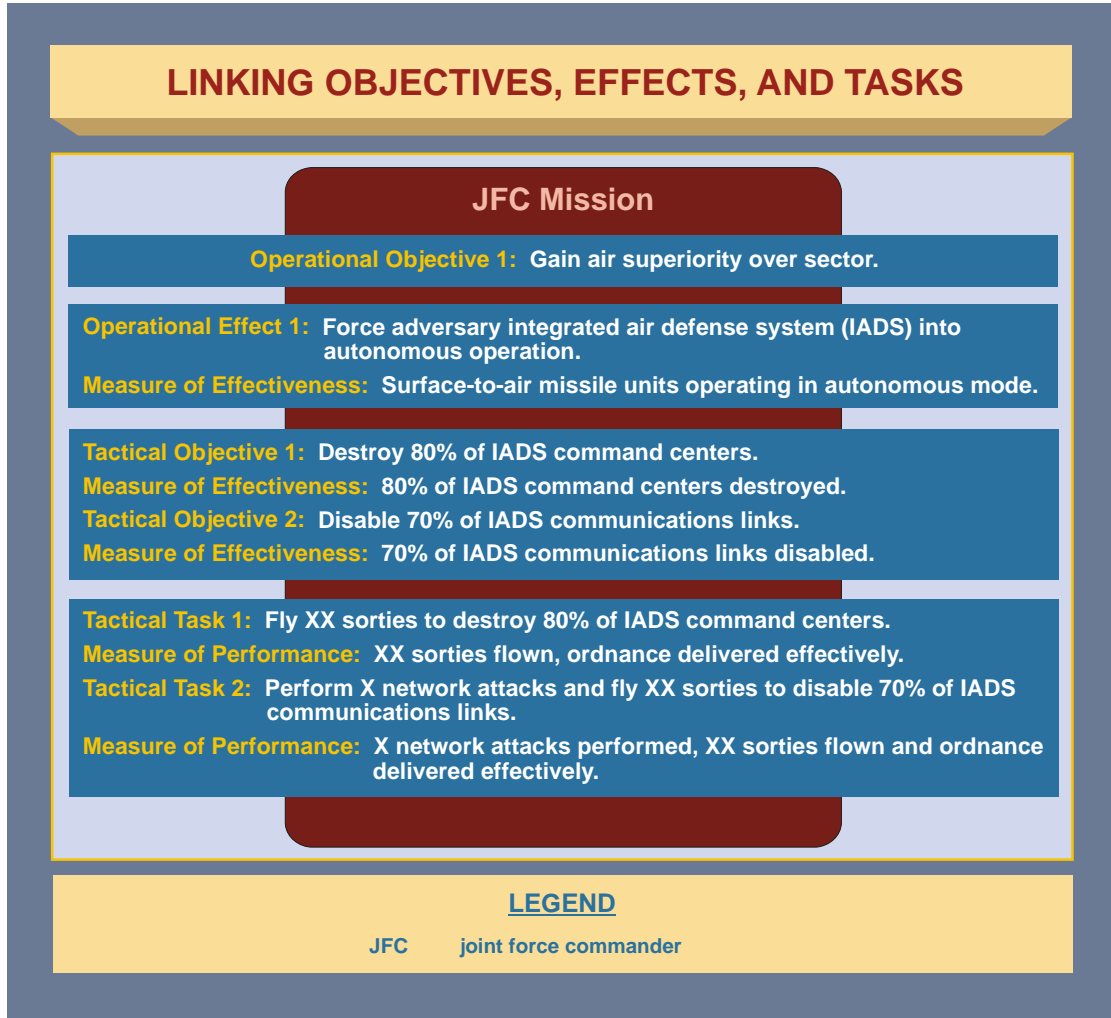


Figure III-7. Linking Objectives, Effects, and Tasks

(m) During air COA development, the **JFACC and staff help the commander identify risk areas that require attention.** These will vary based on the specific mission and situation and may be divided into two broad areas: combat support and operational considerations. Combat support includes TPFDD planning that will critically affect the joint force strategy and execution. Also considered with the TPFDD are basing, access, logistic support available, and force protection requirements (see Figure III-9). However, since TPFDD execution, basing, and logistic support are the responsibility of the JFC and Service components, the JFACC’s planning effort needs to focus on the limitations and constraints imposed by them.

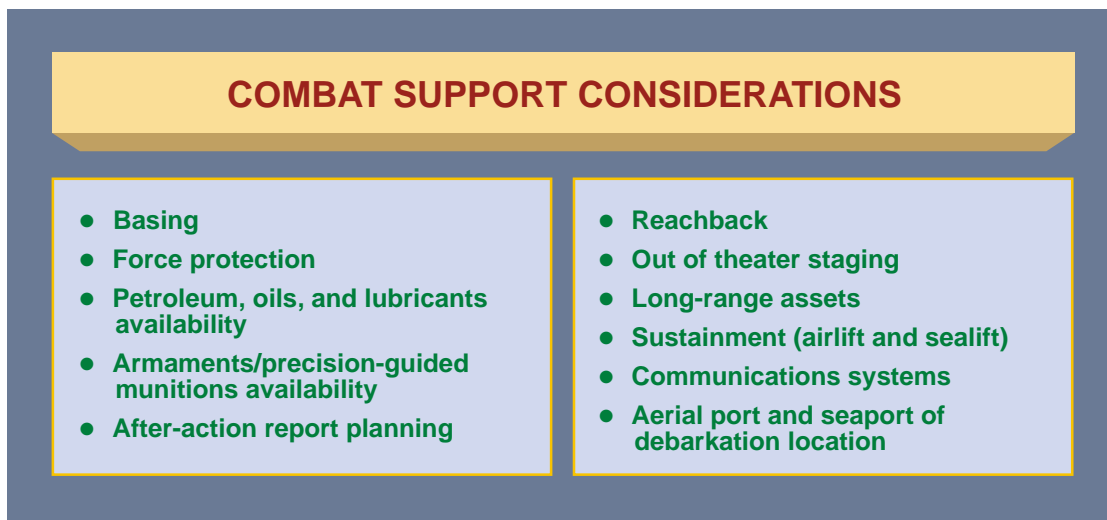


Figure III-8. Combat Support Considerations

(n) Decisions related to operational assumptions may drive changes in how the JFACC operates. These changes range from JOPPA process changes to targeting and weaponing methods. **One of the first considerations for the JFACC is air superiority.** The JFACC is responsible for considering the risk related to air defense planning when designated as the AADC. The commander’s operational assumptions will determine the resources committed, force posturing, and structure of the air and missile defense plan.

(o) The JFACC may also be designated the SCA within a joint force to coordinate joint space operations and integrate space capabilities. This responsibility may entail the coordination and integration of the capabilities of other Services’ and national agencies’ space assets in order to maintain space superiority and exploit the space domain to create effects across the other domains to achieve JFC objectives. Space considerations should be fully integrated with operations in the other domains, and should be fully incorporated into COA development, to ensure that the JFC’s objectives are met most effectively.

(p) The JFC’s assumptions will also affect the operational assumptions made by the joint force air strategists and planners. The joint force structure and campaign or OPLAN directly influence the JFACC’s risk estimate and guidance.

(q) Minimizing the risk of fratricide and collateral damage are operational factors in risk management (see Figure III-10). **The commander must balance the potential for fratricide and collateral damage with mission success.** When the risk becomes unacceptable, the commander should consider changes in operational employment.

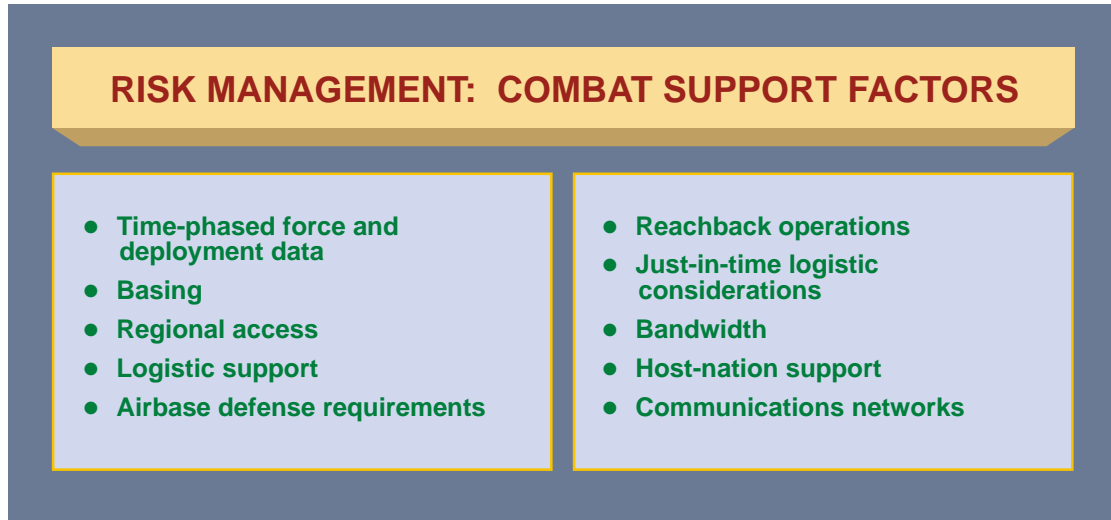


Figure III-9. Risk Management: Combat Support Factors

(4) Step 4. COA Analysis and Wargaming

(a) **COA analysis involves wargaming each COA against the adversary's most likely and most dangerous COAs.** Wargaming is a recorded “what if” session of actions and reactions designed to visualize the flow of the conflict or operation and evaluate each friendly COA in the light of adversary adaptation. Wargaming is a valuable step in the planning process because it stimulates ideas and provides insights that might not otherwise be discovered. It also provides initial detailed planning while also determining the strengths and weaknesses of each COA. This may alter or create a new COA based on unforeseen critical events, tasks, or problems identified. Wargaming is often a sequential process, but planning groups should adjust their wargame style based on JFACC guidance, time available, situation, and staff dynamics. Wargaming begins by assembling all the tools and information planners require and establishing the general rules to follow. Recording the activity is vital and directly contributes to identifying the advantages and disadvantages of a COA and providing sufficient detail for future JAOP development. Planners may use a synchronization matrix to detail the results of wargaming.

(b) Time permitting, the staff should:

1. Consider all facts and assumptions in the estimate and their possible effects on the action.
2. Consider active and passive measures to decrease the impact of adversary counteractions.
3. Consider conflict termination issues and the end state.



Figure III-10. Risk Management: Operational Factors

4. Think through one's own actions, adversary reactions, and friendly counteractions.

(c) COA analysis and wargaming concludes when planners have refined each plan in detail and identified the advantages and disadvantages of each air COA. Automation in the planning process and joint analysis centers may provide additional modeling support to wargaming, increasing the accuracy and speed of COA analysis.

(5) Step 5. COA Comparison

(a) Comparing air COAs against predetermined criteria provides an analytical method to identify the best employment options for air forces and capabilities. The same method used in JP 5-0, *Joint Operation Planning*, is used in air COA comparison.

(b) Another technique for air COA comparison involves developing an objective-risk timeline. Logical LOOs may help to elucidate the relationships between objectives, effects, time, and risk. In logical LOOs, objectives, decisive points, or other significant events are plotted against a timeline that identifies when certain objectives or actions will occur. Risk for each air COA based on the logical LOO is identified. The resulting graphical representation may form the basis for the staff's recommendation and presentation to the JFACC.

(6) Step 6. COA Approval. The staff determines the best air COA to recommend to the commander. The staff presents their recommended air COA usually in the form of a briefing. This briefing includes a summary of the operational design and planning process that led to the recommended air COA. Ideally, the JFACC should be involved in the process, especially in the early operational design stages. Depending on the level of JFACC involvement and the degree of parallel planning the commander accomplishes, **air COA selection will vary from choosing among various alternatives to directly approving the staff-recommended air COA.** The air COA is identified,

adjusted (if required), and selected by the JFACC for presentation to the JFC. Once the JFC approves an air COA, the JOPPA contributes directly to JAOP preparation.

(7) Step 7. Plan or Order Development

(a) For the joint air component, this step concentrates on the preparation of the JAOP. JAOP development is a collaborative effort of the JFACC staff, the JFC staff, other joint force component staffs, and outside agencies. **The JAOP details how the joint air effort supports the JFC's overall operation or campaign plan.** The JAOP should accomplish the following:

1. Integrate the efforts of joint air capabilities and forces and, where applicable and appropriate, space and cyberspace capabilities and/or support mechanisms/enablers.

2. Identify objectives, effects, and tasks.

3. Identify measures and indicators of success used to determine whether air operations are creating desired effects and achieving objectives.

4. Account for current and potential adversary COAs.

5. Integrate and synchronize the phasing of operations with the JFC's plan.

6. Indicate what capabilities and forces are required to achieve joint air objectives. In addition to air capabilities and forces, planners should include land, maritime, space, and IO (including cyberspace) that are required to meet joint air objectives.

a. Once Service components provide information, total force structure is determined, force availability, deployment, timing, basing availability, and sustainment requirements are matched with logistic and planning requirements.

b. With this information, the JFACC's ability to accomplish the assigned mission is reevaluated and adjusted as necessary.

c. This evaluation includes a comprehensive sustainability assessment.

7. Develop specific procedures for allocating, tasking, exercising, and transitioning C2 of joint air capabilities and forces.

(b) **In addition to building the plan for the employment of air forces,** the JAOP should also include considerations for phase transitions, decision points, conflict termination, redeployment (if applicable), and procedures to capture lessons

learned. Incomplete planning for conflict termination and the end state can result in the waste of valuable resources, aggravate a tenuous peace, cause a return to hostilities, or lead to numerous other unintended consequences. The list of considerations for conflict termination is specific to each situation and is never formulated in a vacuum, nor without extensive consultations with national leadership and OGAs. This part of the plan should also address the prospect of the “surge” of air forces to accomplish phases of the operation, based on projected operating tempo.

4. Joint Targeting Process

a. **Targeting is the process of selecting and prioritizing targets and matching the appropriate response to them, considering operational requirements and capabilities.** Targeting is both a joint- and component-level function that determines desired effects necessary to accomplish JFC objectives, selects targets that, when attacked, can create those effects, and selects and tasks the means to best engage those targets. **Targeting is complicated by the requirement to deconflict unnecessary duplication of target nominations by different forces or different echelons within the same force and to integrate the attack of those targets with other components of the joint force.** An effective and efficient target development process coupled with an air tasking cycle is essential for the JFACC to plan and execute joint air operations. The joint targeting process should integrate the intelligence databases, analytical capabilities, and data collection efforts of national agencies, combatant commands, subordinate joint force, and component commands, all of which possess varying ISR capabilities and requirements. The process is the same across the entire range of military operations.

b. The joint targeting cycle is an iterative process that is not time-constrained, and steps may occur concurrently, but it provides a helpful framework to describe the steps that must be satisfied to successfully conduct joint targeting. The deliberate and dynamic nature of the joint targeting process is adaptable through all phases of the air tasking cycle. As the situation changes and opportunities arise, the step of the joint targeting process can be accomplished quickly to ensure the commander’s objectives are met. **There are six phases to the joint targeting cycle: end state and commander’s objectives, target development and prioritization, capabilities analysis, commander’s decision and force assignment, mission planning and force execution, and assessment.**

See also JP 3-60, Joint Targeting, and JP 3-09, Joint Fire Support, for guidance.

c. **Targeting mechanisms should exist at multiple levels.** The President, Secretary of Defense, or headquarters senior to JFCs may provide guidance, priorities, and targeting support. Joint force components identify requirements, nominate targets that are outside their operational area or exceed the capabilities of organic and supporting assets, and conduct execution planning. After the JFC makes final targeting decisions, components plan and execute assigned missions.

d. **Typically, the JFC organizes a joint targeting coordination board (JTCB).** The JTCB's focus is to develop broad targeting priorities and other guidance in accordance with the JFC's objectives as they relate operationally. The JFC normally appoints the deputy JFC or a component commander to chair the JTCB. If the JFC so designates, a JTCB may be an integrating center to accomplish broad targeting oversight functions or a JFC-level review mechanism. The JTCB needs to be a joint activity comprised of representatives from the staff, all components, and, as required, other agencies, multinational partners, and/or subordinate units.

e. **The JFC defines the role of the JTCB.** The JTCB provides a forum in which all components can articulate strategies and priorities for future operations to ensure they are integrated and synchronized. **The JTCB normally facilitates and coordinates joint force targeting activities with the components' schemes of maneuver to ensure that the JFC's priorities are met.** Targeting issues are generally resolved below the level of the JTCB, by direct coordination between elements of the joint force, but the JTCB and/or JFC may address specific targeting issues not previously resolved.

See JP 3-60, Joint Targeting, for more information on the JTCB.

f. **The JFC will normally delegate the authority to conduct execution planning, coordination, and deconfliction associated with joint air targeting to the JFACC and will ensure that this process is a joint effort.** The JFACC must possess a sufficient C2 infrastructure, adequate facilities, and ready availability of joint planning expertise. A targeting mechanism tasked with detailed planning, weaponeering, and execution is also required to facilitate the process.

g. The JFACC develops a JAOP that accomplishes the objectives directed by the JFC. **Integration, synchronization, deconfliction, allocation of air capabilities and forces, and matching appropriate weapons against target vulnerabilities are essential targeting functions for the JFACC.** National agencies, higher headquarters, JTFs, and task forces subordinate to the JFC, supporting unified commands, and functional/Service components may nominate targets to the JFC for processing and inclusion on the JIPTL. Targeting requirements that support their assigned missions are provided via a candidate target list and once consolidate, through a target nomination list (TNL) (see JP 3-60, *Joint Targeting*). **Targets scheduled for attack by component air capabilities and forces should be included on an ATO for deconfliction and coordination.** All component commanders within the joint force should have a basic understanding of each component's mission and general scheme of maneuver. All components should provide the JFACC a description of their air plan to minimize the risk of fratricide, assure deconfliction, avoid duplication of effort, and provide visibility to all friendly forces. This basic understanding allows for integration of targeting efforts between components and within the JFC staff and agencies.

5. The Targeting Effects Team

a. The JFACC normally has a targeting effects team (TET) as part of the JAOC. The TET's responsibilities are varied but key to the targeting process. The TET links targets to be attacked by joint air forces and capabilities to guidance on desired effects and MOEs/MOPs provided by commanders and the JAOC's SD. It also deconflicts and coordinates target nominations based on estimates of what targets can be attacked and provides other targeting support requiring component input at the JFACC level. If the JFC delegates joint targeting coordination authority to the JFACC, the TET also receives all target nominations (that cannot be addressed at lower echelon levels) and prioritizes them in accordance with the operational objectives and tasks set forth in the AOD to form the draft JIPTL. Common organizational guidelines of the TET include the following:

- (1) Chaired by the deputy JFACC or designated representative.
- (2) Senior component LNOs and key JFACC staff members comprise the TET.
- (3) The JAOC CPD provides the staff support to the TET during the air tasking process.

b. **Draft JIPTL Construction.** The draft JIPTL is formed from a prioritized listing of targets based on JFC and component target priorities. In the case of a theater JFACC supporting multiple JFCs (e.g., two or more JTF commanders), the draft JIPTL should be constructed to meet the requirements of each supported JFC. Members consider the estimated available air capabilities and their ability to affect the targets on the list. A draft JIPTL "cut line" is normally established. The draft JIPTL "cut line" should reflect which targets will most likely be serviced (barring technical problems with aircraft, weather, retasking for higher priority targets, or other operational circumstances) with the projected apportionment of air assets assigned or made available to the JFACC. Component LNOs and JAOC staff members should be ready to justify and/or prioritize target nominations among all the priorities of the joint operation. **The JFACC may also recommend to the JFC that other component assets be used against targets on the draft JIPTL.** Close coordination must continue with the development of the JIPTL and with the development of the joint integrated prioritized collection list (JIPCL) to ensure effective and efficient use of assets that may be used to address targets on both the JIPTL and/or the JIPCL. Only the JFC can approve this use of other components' assets and forces.

6. The Joint Air Tasking Cycle

a. The joint air tasking process provides for the effective and efficient employment of joint air capabilities and forces made available. This process provides an iterative, cyclic process for the planning, apportionment, allocation, coordination, and tasking of joint air missions and sorties within the guidance of the JFC. **The process accommodates changing tactical situations or JFC guidance as well as requests for support from other component commanders.** The joint air tasking process is an

analytical, systematic cycle that **focuses joint air efforts on accomplishing operational requirements**. Much of the day-to-day tasking cycle is conducted through an interrelated series of information exchanges and active involvement in plan development, target development, air execution, and assessment (through designated component LNOs and/or messages), which provide a means of requesting and scheduling joint air missions. **A timely ATO is critical** – other joint force components conduct their planning and operations based on a prompt, executable ATO and are dependent on its information. Figure III-11 shows typical JFACC tasking process responsibilities.

b. **The joint air tasking cycle begins with the JFC’s objectives, incorporates guidance received during JFC and component coordination, and culminates with assessment of previous actions.** The ATO articulates the tasking for joint air operations for a specific execution timeframe, normally 24 hours. The joint air tasking cycle is synchronized with the JFC’s battle rhythm. The JAOC normally establishes a 72-96 hour ATO planning cycle. The battle rhythm or daily operations cycle (schedule of events)

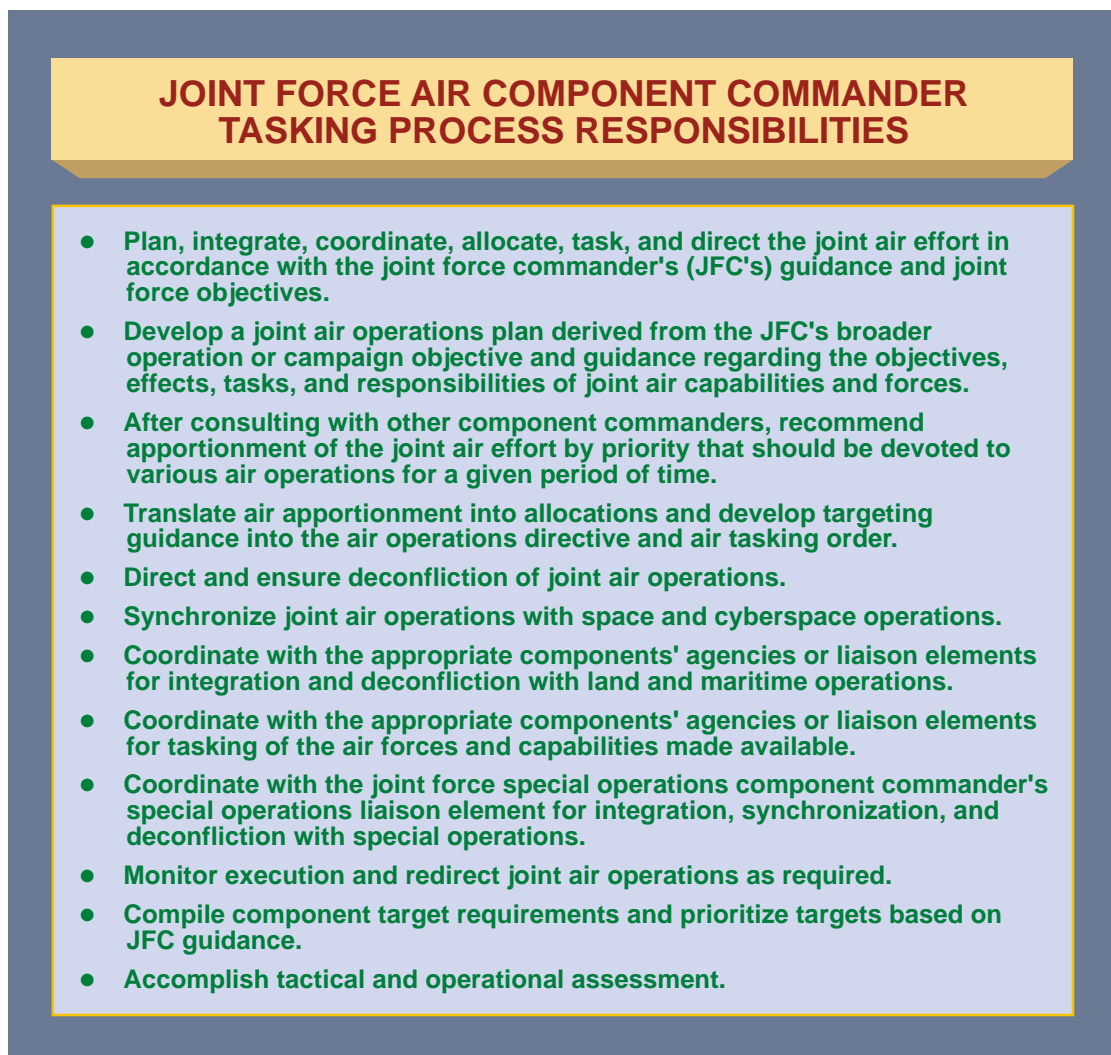


Figure III-11. Joint Force Air Component Commander Tasking Process Responsibilities

articulates briefings, meetings, and report requirements. It provides suspenses for targeting, air support requests, airspace control means requests, and etc., to produce the air battle plan (ABP). The battle rhythm is essential to ensure information is available when and where required to provide products necessary for the synchronization of joint air operations with the JFC's CONOPS and supporting other components' operations. Nonetheless, the tasking process remains a responsive cycle, capable of modification up to and during the execution period. The net result of the tasking process is a series of ATOs and related products in various stages of progress at any time.

- (1) At least one ATO undergoing assessment at various levels.
- (2) An ATO currently being executed.
- (3) An ATO currently in production.
- (4) An ATO in detailed planning (target development and weaponeering).
- (5) An ATO in strategy development (guidance and objectives).

c. The full air tasking cycle, from JFC guidance to the start of ATO execution is dependent on the JFC's and JFACC's procedures. A 72-hour cycle, starting with objectives, effects, and guidance is fairly standard. The precise timeframes should be specified in the JFC's OPLAN or the JFACC's JAOP. Long-range combat air assets positioned outside the theater but operating in the JOA may be airborne before ATO publication or execution. These assets require the most current ATO information and updates. The JAOC, however, possesses the capability to retask such missions even during execution. Intertheater air mobility missions may not necessarily operate within the established tasking cycle. The CPD should carefully consider how these and intratheater air mobility missions should be integrated into the ATO.

d. The ATO matches specific targets compiled by the JFACC and staff with the capabilities and forces made available to the JFACC for the given ATO day. Other component air missions that appear on the ATO may not be under the control of the JFACC, but their presence on the ATO provides visibility for overall coordination and deconfliction. Figure III-12 depicts the generalized air tasking cycle and many of its products.

e. **Joint Air Tasking Cycle Stages.** The joint air tasking cycle consists of 6 stages. The six stages of the joint air tasking cycle are interrelated with portions of the joint targeting process which is broader in scope, but the approach is the same. Both are systematic processes to match available capabilities and forces with specific targets to achieve the JFC's objectives. Unlike the joint targeting cycle, the joint air tasking cycle is time-dependent. The joint air tasking process is built around finite time periods required to plan, prepare for, and conduct joint air operations. The number and length of ATO development phases may vary based on contingency requirements. **Prior to the JFC and component commanders' meeting, the JFACC should meet with senior**

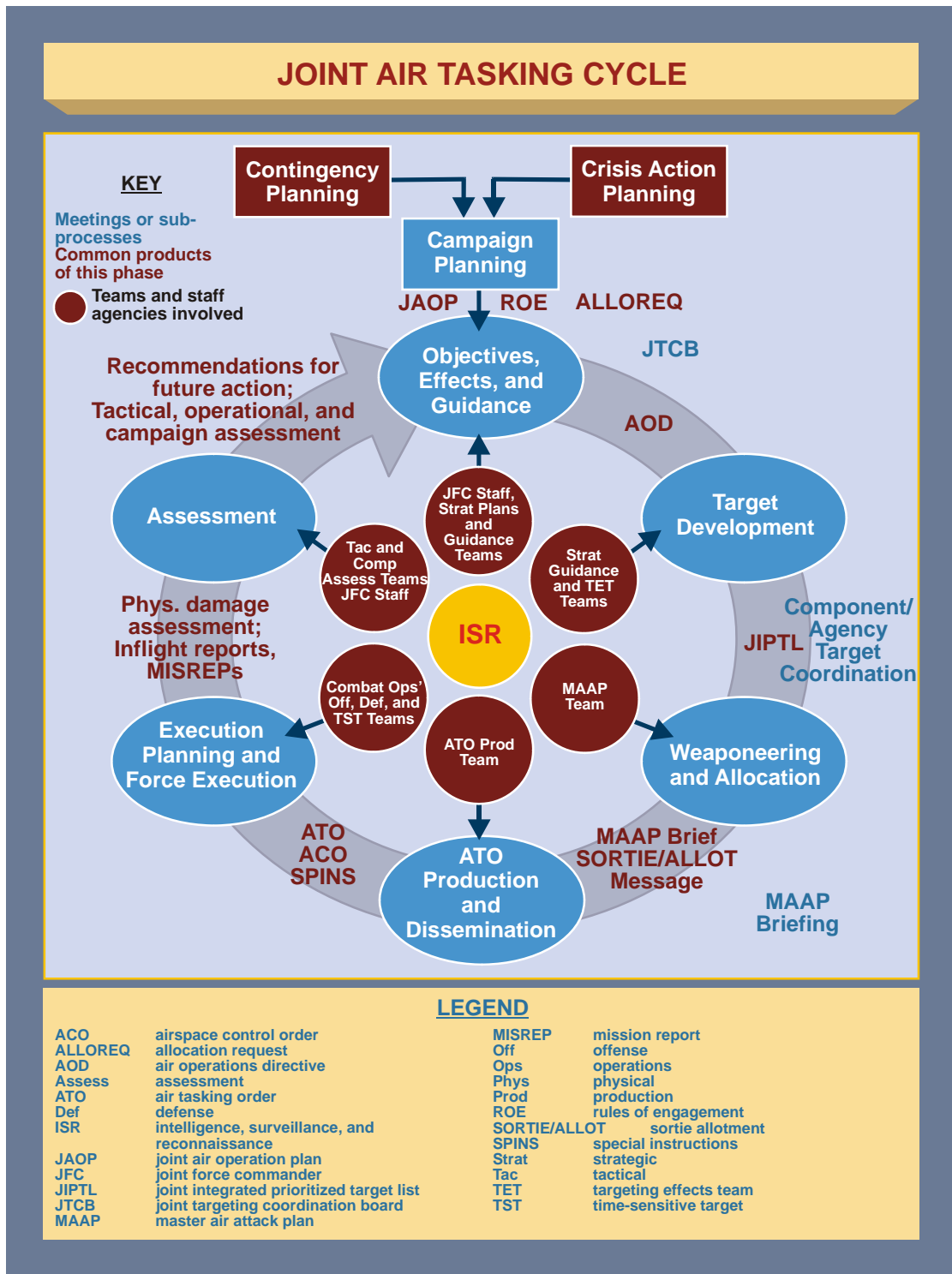


Figure III-12. Joint Air Tasking Cycle

component liaisons and his staff to develop recommendations on joint air planning and apportionment for future operations. (The use of the term “meeting” is notional; other methods of information exchange can also be used.) This meeting may review JFC

objectives and guidance, assess and analyze results of joint force operations and consider changes to ongoing joint air operations; review adversary capabilities and COAs, COGs, decisive points, critical vulnerabilities, and key targets, and discuss updates to the JIPTL, based on JFC guidance. The JFACC should provide objectives and guidance to the staff for joint air operations to achieve the JFC's intent, recommend an air scheme of maneuver, review joint force capabilities and forces available to achieve assigned tasks, refine requirements for capabilities and forces from other components, and, in consultation with other component commanders, formulate an air apportionment recommendation for presentation to the JFC.

(1) Stage 1: Objectives, Effects, and Guidance

(a) The JFC consults often with component commanders to assess the results of the joint force's efforts and to discuss the strategic direction and future plans. This provides component commanders an opportunity to make recommendations, make support requirements known, and state their ability to support other components. The JFC provides updates to the guidance, priorities, and objectives based on enemy operations and the current/expected friendly order of battle. The JFC also refines the intended CONOPS. **The JFC's guidance on objectives and effects will identify targeting priorities and will include the JFC's air apportionment decision.**

(b) **Air Apportionment.** Air apportionment allows the JFC to ensure the priority of the joint air effort is consistent with campaign or operation phases and objectives. Given the many functions that joint air forces can perform, its operational area-wide application, and its ability to rapidly shift from one function to another, JFCs pay particular attention to air apportionment. **After consulting with other component commanders, the JFACC makes the air apportionment recommendation to the JFC.** The methodology the JFACC uses to make the recommendation may include priority or percentage of effort devoted to assigned mission-type orders, JFC objectives, or other categories significant to the campaign or operation. The air apportionment recommendation is a vital part of the joint air planning and tasking process. The JAOC SD formulates the air apportionment recommendation that the JFACC submits to the JFC for upcoming iterations of the joint tasking cycle. With air capabilities made available to the JFACC, the strategy plans team can recommend the relative level of effort and priority that may be applied to various JFC and/or JFACC objectives. The end result is an air apportionment recommendation. This product is normally forwarded to the JTCB for coordination and approval by the JFC. In the case of a theater JFACC supporting multiple JFCs (e.g., two or more JTF commanders), the air apportionment recommendation (e.g., CAS, interdiction) referenced here is made to each supported JFC. The JFC is the final approval authority for the air apportionment decision.

(2) **Stage 2: Target Development.** This is the point in the joint targeting cycle and intelligence process, after analysts from other organizations have incorporated all-source intelligence reports into a targeting database, where efforts of the joint air targeting cycle relate target development to air tasking and target aimpoints are selected,

and these and other data are submitted to the TET. The TET correlates target nominations. It screens nominated targets and ensures that once attacked, they create the desired effects that meet JFC guidance as delineated in the AOD, and verifies that chosen MOEs will accurately evaluate progress and can be collected against. It prioritizes nominated targets based on the best potential for creation of the JFC's desired effects and components' priorities and timing requirements. The product of this effort, when approved by the JFC or his designated representative (e.g., JTCB), is the JIPTL.

(3) **Stage 3: Weaponing and Allocation**

(a) During this stage, **JAOC personnel quantify the expected results of the employment of lethal and nonlethal means against prioritized targets to create desired effects.** The JIPTL provides the basis for weaponing assessment activities. All approved targets are weaponed, to include recommended aimpoints, weapon systems and munitions, fusing, target identification and description, desired direct effects of target attack, probability of creating the desired effect, and collateral damage concerns. **The final prioritized targets are developed and are then provided to the master air attack plan (MAAP) team.** The TET may provide the MAAP team a draft JIPTL to begin initial planning. Once the JIPTL is approved by the JFC, the MAAP team can finalize force allocation (sortie flow plan). The force application cell can complete coordination with the supporting force enhancement cell to satisfy mission requirements to ensure the prioritized targets are planned to generate effects to achieve objectives while maximizing the combat effectiveness of joint air assets. **The resulting MAAP is the plan for employment that forms the foundation of the ATO.** The MAAP is normally a graphic depiction of capabilities required for a given period. The development of the MAAP includes review of JFC and JFACC guidance, component plans and their support requests, updates to target requests, availability of capabilities and forces, target selection from the JIPTL, and weapon system allocation. Components may submit critical changes to target requests and asset availability during this final phase of ATO development. The completed MAAP matches available resources to the prioritized target list. It accounts for air refueling requirements, suppression of enemy air defenses requirements, air defense, ISR, and other factors affecting the plan.

(b) **Air Allocation.** Following the JFC's air apportionment decision, **the JFACC translates that decision into total number of sorties by weapon system type available for each objective and task.** Based on the apportionment decision, internal requirements, and air support request messages, each air-capable component prepares an allocation request (ALLOREQ) message for transmission to the JFACC (normally not less than 36 hours prior to the start of the ATO execution period, thus coinciding with the beginning of the MAAP process). ALLOREQ messages report:

1. Excess sorties not required by the air-capable component and available for tasking by the JFACC.
2. Requests for air support.

JOINT OPERATION PLANNING PROCESS

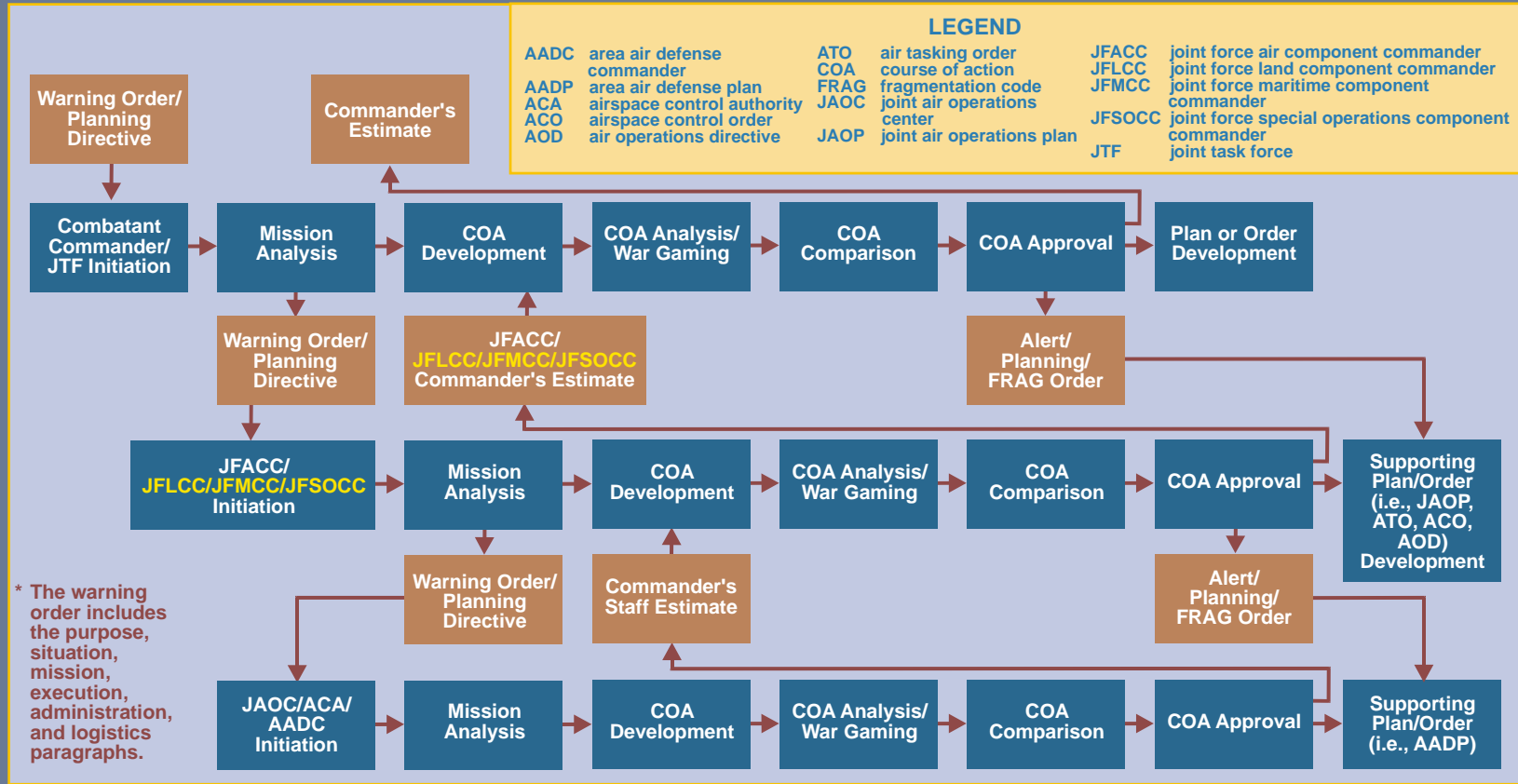


Figure III-13. Joint Operation Planning Process

(4) **Stage 4: ATO Production and Dissemination.** JFC and JFACC guidance, including the AOD; target worksheets; the MAAP; and component requirements are used to finalize the ATO, SPINS, and ACO. **Planners must develop airspace control and air defense instructions in sufficient detail to allow components to plan and execute all air missions listed in the ATO.** These directions must enable combat operations without undue restrictions, balancing combat effectiveness with the safe, orderly, and expeditious use of airspace. Instructions must provide for quick coordination of task assignment and reassignment (redirection, retargeting, or change of type of mission) and must direct aircraft identification and engagement procedures and ROE appropriate to the nature of the threat. These instructions should also consider the volume of friendly and possibly neutral air traffic, friendly air defense requirements, identification-friend-or-foe technology, weather, and adversary capabilities. Instructions are contained in SPINS and in the ACO, and are updated as frequently as required. The AOD, ATO, ACO, and SPINS provide operational and tactical direction at appropriate levels of detail. The level of detail should be very explicit when forces operate from different bases and multi-component or composite missions are tasked. In contrast, less detail is required when missions are tasked to a single component or base.

(5) **Stage 5: Execution Planning and Force Execution.** **The JFACC directs the execution of air capabilities and forces made available for joint air operations.** Inherent in this is the authority to redirect joint air assets. The JFACC will coordinate with affected component commanders upon redirection of joint sorties previously allocated for support of component operations. **Aircraft or other capabilities and forces not apportioned for joint air operations, but included in the ATO for coordination purposes, may be redirected only with the approval of the respective component commander or JFC.** **Aircraft or other capabilities and forces made available for joint air operations may be redirected with the approval of the JFACC.**

(a) **The JAOC must be responsive to required changes during the execution of the ATO.** In-flight reports, discovery of time-sensitive targets (TSTs), and initial assessment (such as battle damage assessment [BDA]) may cause a redirecting of joint air capabilities and forces before launch or a redirection once airborne.

(b) During execution, **the JAOC is the central agency for receiving the tasking of joint air capabilities and forces.** It is also charged with coordinating and deconflicting those changes with the appropriate control agencies and components.

NOTE: Care must be taken when redirecting sorties from one target to another to ensure the proper weapons and fuses are available for the new target.

(c) Due to operational environment dynamics, **the JFACC may be required to make changes to planned joint air operations during execution.** Employment of joint air assets against emerging targets requires efficient, timely information sharing and decisionmaking among components. It is critical that procedures be established, coordinated, and promulgated by the JFC before operations begin. **The dynamic targeting portion of the joint targeting cycle is established to facilitate this**

process. The JFACC will coordinate with affected component commanders to ensure deconfliction of targets and to ensure those forces are out of danger relative to the new target area(s).

(d) **During execution, the JFACC is responsible for redirecting joint air assets to respond to moving targets or changing priorities.** Ground or airborne C2 platform mission commanders may be delegated authority from the JFACC to redirect sorties or missions made available to higher priority targets. It is essential, however, that the JAOC be notified of all redirected missions.

(6) **Stage 6: Assessment. Assessment is performed by all levels of the joint force.**

(a) The JFC should establish a dynamic system to conduct assessment throughout the joint force and to ensure that all components are contributing to the overall joint assessment effort. Normally, the joint force J-3 is responsible for coordinating assessment, assisted by the J-2. Assessment is a continuous process that measures the overall effectiveness of employing joint force capabilities during military operations. It determines progress toward accomplishment of tasks, creation of effects, and achievement of objectives. **The JFACC should continuously plan and evaluate the results of joint air operations and provide assessments to the JFC for consolidation into the overall assessment of the current operation.**

(b) Within the joint force, assessment is conducted at both the tactical and operational levels. At the tactical level, assessment is essential to decisionmaking during ATO execution. However, the tactical assessment process continues over days or weeks to evaluate the effectiveness of weapons and tactical engagements as additional information and analysis become available from sources within and outside the operational area. Air planners should determine MOPs to evaluate task accomplishment and MOEs to assess changes in system behavior, capability, or the operational environment. Planners should ensure that they establish logical links between air objectives and tasks and the measures used to evaluate them early in the planning sequence. They should also ensure that they identify intelligence collection management and other ISR requirements as part of the planning process. **At the operational level, assessment is concerned with gathering information on the broader results achieved by air operations and planning for future operations.**

(c) In general, the assessment process at the tactical level provides one of the major sources of information for performing assessment at the operational level. Tactical inputs, along with a wide assortment of other information, aid in the development of the air component's operational-level assessment.

(d) The JFACC's operational-level assessment should be forwarded to the joint force J-3 as one component's input to the JFC's overall determination of the operation's success. Operational-level assessment can also serve as the basis for

important recommendations that can affect the JFC's apportionment decision and the JFACC's allocation of air resources.

(e) Although assessment appears to mark the end of the air tasking cycle, it is an ongoing activity that provides important inputs to decision-making and aiding processes throughout that cycle.

SECTION B. OTHER CONSIDERATIONS

7. Intelligence, Surveillance, and Reconnaissance Considerations

a. The GCC (theater J-2) may retain collection management authority (CMA) to establish, prioritize, and validate theater collection requirements, establish sensor tasking guidance, and develop theater-wide collection policies. CMA may reside at the JTF level or may be delegated to components. The theater J-2 retains full management authority (i.e., to validate, to modify, or to nonconcur) over all intelligence collection requirements within the AOR. The JFC's J-2 and J-3 jointly develop an overall collection strategy and posture for the execution of the ISR mission. The joint force J-2 reviews, validates, and prioritizes all intelligence requirements for the JFC. Users requesting airborne ISR support should make a concerted effort to request a clear identification of their required information or ISR product and not a specific ISR platform to perform a mission. For example, many different aircraft can provide imagery and data. Depending on the request, there might be more than one type of asset available to support a mission. Airborne ISR aircraft are typically high demand assets due to mission duration, and the ability to quickly respond to TST requests, and their ability to support multiple users. Retasking an airborne ISR asset during mission execution must be carefully considered. Dynamic retasking of ISR assets should be done by the appropriate commander after evaluating the full impacts of diverting the capability from the current mission and the impact to operational success or consequences without the asset. Dynamic ISR retasking priorities and procedures must be clearly specified in the ROE and SPINS.

b. The JFACC will normally be the supported commander for the airborne ISR effort. The JFC will normally delegate collection operations management for joint airborne ISR to the JFACC to authoritatively direct, schedule, and control collection operations for use by the J-2 in associated processing, exploitation, and reporting. The JAOC should request ISR support from the JFC or another component if assigned assets cannot fulfill specific airborne ISR requirements. It is imperative that the JFACC remains aware of all available surveillance and reconnaissance capabilities that can be integrated into joint air operations. ISR division collection managers build a daily collection plan, the reconnaissance, surveillance, and target acquisition annex, as a commonly-understood plan which tasks airborne ISR platforms sensors and PED nodes. This product is an annex to the ATO and is available to the entire joint force. It is completed by ISR personnel in the MAAP.

c. National and non-DOD ISR resources are not normally placed under the JFC's OPCON. These resources may provide direct support to the JFC or one of the

components, either full-time or on-call, but are normally shared with other commands or components. The supported commander will be provided with liaison teams upon request. These teams will normally be the points of contact for coordinating their specific ISR resources and associated capabilities with the supported commander's ISR operators. ISR operators forward the requirements to the appropriate command authority for approval.

d. ISR personnel are integrated into the JAOC. The complexity of integrating airborne ISR will normally determine whether the function is handled by a specialty team, cell, or division within the JAOC. The JFACC's ISR collection managers and operations planners will work with the joint force staff and other components to effectively coordinate national and theater ISR objectives. The ISR collection elements will manage and satisfy the JFACC's information requirements.

e. The JFACC provides integrated airborne ISR for the JFC. The JAOC provides the force integrated information from the JFACC's available airborne ISR support.

See JP 2-01, Joint and National Intelligence Support to Military Operations, for further information.

f. ISR systems undergoing the acquisition and research and development process, particularly the advanced concept technology demonstration phase, are normally requested through military development organizations and involve the applicable contractor. In such cases, the contractor is often requested to provide technical representatives in the JAOC and/or at the national or theater intelligence agency.

8. Air Mobility Considerations

a. Air mobility missions are integral to the success of joint operations. **Airlift is critical for deployment, redeployment, and sustainment, while aerial refueling is critical to enable and sustain air operations.** AE is the most expeditious method of patient movement. Commander, US Transportation Command, normally retains OPCON of intertheater air mobility assets due to their global mission and nature. A support relationship is established between CCDRs. Intratheater airlift and theater refueling assets may be attached to a JTF, with OPCON normally delegated down to the appropriate Service component commander (usually the COMAFFOR). Integrating air mobility planning into the JAOP and monitoring mission execution is normally the responsibility of a DIRMOBFOR, appointed by the COMAFFOR and supported by a team of mobility specialists in the JAOC.

b. The DIRMOBFOR functions as coordinating authority for air mobility with all commands and agencies, both internal and external to the JTF. **The DIRMOBFOR is normally a senior officer who is familiar with the AOR or JOA and possesses an extensive background in air mobility operations.** When appointed, the DIRMOBFOR serves as the designated agent for all air mobility issues in the AOR or JOA, and for other duties as directed. The DIRMOBFOR exercises coordinating authority between the

theater AOC (or theater JAOC if established), Air Mobility Command's 618th Tanker Airlift Control Center (618th TACC), and the joint movement center (JMC)/joint deployment and distribution operations center (JDDOC), to expedite the resolution of air mobility issues. The DIRMOBFOR may be sourced from the theater's organizations or USTRANSCOM. Additionally, the DIRMOBFOR, when designated, will ensure the effective integration of intertheater and intratheater air mobility operations, and facilitate intratheater air mobility operations on behalf of the COMAFFOR. **The DIRMOBFOR provides, on behalf of the COMAFFOR, guidance to the AMD on air mobility matters, but such guidance should be responsive to the timing and tempo of operations managed by the JAOC director. The JAOC AMD remains under control of the JAOC director who manages execution of operations for the JFACC.** The DIRMOBFOR is the primary interface for other air mobility operations occurring in theater. The DIRMOBFOR should be collocated with the AMD to maximize effectiveness. Operationally, the DIRMOBFOR normally works directly for the JFACC. The DIRMOBFOR provides direction to the AMD, but the AMD must be responsive to the JAOC director.

c. **DIRMOBFOR also has distinct responsibilities in relation to JFC staffs.** Air mobility requirements do not originate in the JAOC. They originate at the component level and are validated by either the theater JMC/JDDOC (when established) or by the GCC's J-3 in coordination with the logistics directorate of a joint staff (J-4). This may vary slightly in different theaters. Consequently, **an essential role for the DIRMOBFOR is to serve as the principal interface between the JAOC, the theater's J-4, and the JMC/JDDOC** to ensure appropriate prioritization of air mobility tasks while balancing requirements and air mobility capability.

d. When a JTF is formed, command relationships for air mobility forces will be established in accordance with the Unified Command Plan and the Global Force Management process. Command of these forces will be as established by the JFC and normally exercised through the COMAFFOR and/or JFACC with the advice and assistance of the DIRMOBFOR. The JAOC director is charged with the effectiveness of joint air operations and focuses on planning, coordinating, allocating, tasking, executing, and assessing air operations in the operational area based on JFACC guidance and DIRMOBFOR coordination. While the JAOC director provides direction principally to the JAOC's strategy, combat plans, and CODs, the DIRMOBFOR's focus is on the AMD and its primary components. Figure III-14 illustrates the arrangement of the JAOC and associated command relationships with respect to air mobility operations.

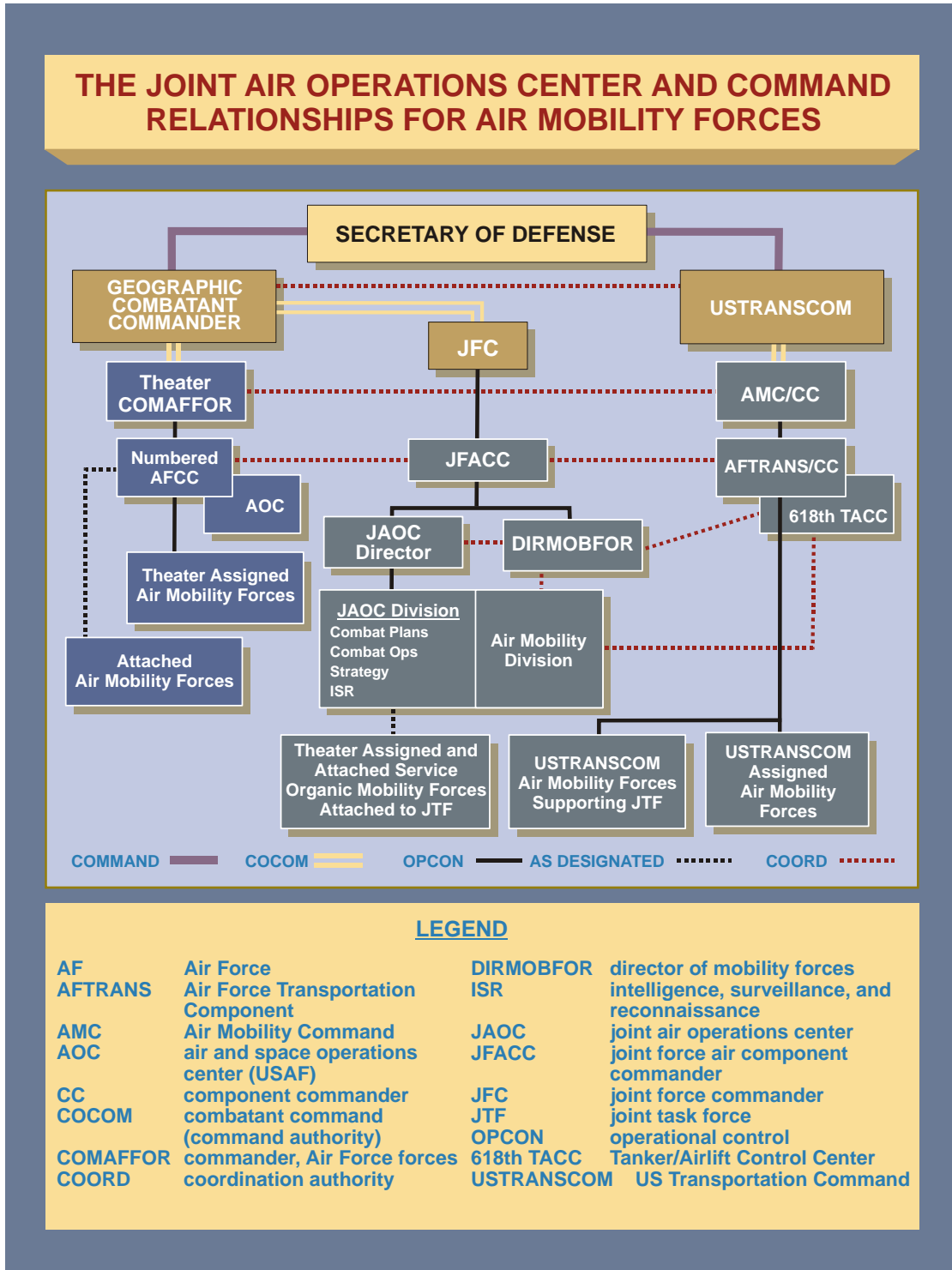


Figure III-14. The Joint Air Operations Center and Command Relationships for Air Mobility Forces

For more detailed information, see JP 3-17, Air Mobility Operations.

9. Unmanned Aircraft Systems Considerations

a. **General considerations. UASs should be treated similarly to manned systems with regard to the established doctrinal warfighting principles.** Like manned aircraft, the operation of UASs should adhere to the guidance contained in this publication. While the JFC retains the authority to determine the use and control of UAS forces, there are some issues for planners and commanders to consider when employing these systems. Modern UAS technology provides commanders with additional information resources that may enable increased situational awareness. (See Figure III-15.)

b. Unique characteristics associated with C2 of UASs

(1) While the C2 processes for UASs are similar to those for manned assets, **several characteristics of UASs can make C2 particularly challenging:**

(a) UAS communication links are generally more critical than those required for manned systems. In the event of lost communications, a manned aircraft will typically press with the mission and/or return safely to a home base or alternate field. Although, UASs can be programmed to return to base upon loss of communication, they rely on a nearly continuous stream of communications (for both flight control and payload) to successfully complete a mission. Therefore, **communications security, and specifically bandwidth protection (from both friendly interference and adversary action) is imperative.**

(b) UASs may be capable of transferring control of the aircraft and/or payloads to multiple operators while airborne. Close coordination amongst all potential operators is required.

(c) Most larger UASs have **considerably longer endurance times** than comparable manned systems. Planners must exploit this capability when tasking UAS assets.

(d) Compliance with the ACO is critical as UA cannot “see and avoid” other aircraft, generally have small radar and visual signatures and may not have identification, friend, or foe capability.

Refer to JP 3-52, Joint Airspace Control, for further information.

(2) **Allocation and tasking of UASs in Joint Operations.** The JFC process for determining what UASs to allocate to the JFACC will be no different than for the manned aircraft allocation decision process. Transferring C2 of UASs within a Service or functional component can be accomplished through Service or functional command structures.

| UNMANNED AIRCRAFT SYSTEMS CATEGORIZATION CHART | | | | |
|--|------------------------------------|--------------------------------|--------------|---|
| UA Category | Maximum Gross Takeoff Weight (lbs) | Normal Operating Altitude (ft) | Speed (KIAS) | Representative UAS |
| Group 1 | 0-20 | < 1200 AGL | 100 kts | WASP III, TACMAV RQ-14A/B, BUSTER, BATCAM, RQ-11B, FPASS, RQ16A, Pointer, Aqua/Terra Puma |
| Group 2 | 21-55 | < 3500 AGL | < 250 | ScanEagle, Silver Fox, Aerosonde |
| Group 3 | < 1320 | < 18,000 MSL | < 250 | RQ-7B Shadow, RQ-15 Neptune, XPV-1 Tern, XPV-2 Mako |
| Group 4 | > 1320 | | Any Airspeed | MQ-5B Hunter, MQ-8B Fire Scout, MQ-1C ERMP, MQ-1A/B/C Predator |
| Group 5 | > 1320 | > 18,000 MSL | Any Airspeed | MQ-9 Reaper, RQ-4 Global Hawk, RQ-4N BAMS |

| LEGEND | | | |
|--------|--------------------------|-----|--------------------------|
| AGL | above ground level | lbs | pounds |
| ft | feet | MSL | mean sea level |
| KIAS | knots indicated airspeed | UA | unmanned aircraft |
| kts | knots | UAS | unmanned aircraft system |

Figure III-15. Unmanned Aircraft Systems Categorization Chart

(a) **C2 of theater-capable UASs.** Theater-capable UASs are able to range the theater of operations and/or support multiple users. They can be used to support the JFC (UASs made available by component commanders), component commanders' operations (organic UASs), or in support of other component commanders. As these low density assets can be in high demand, careful consideration must be made by the JFC and JFACC when making apportionment and allocation decisions. The JFC should attempt to meet the organic needs of the component commanders, while ensuring the JFACC has the assets available to execute JFC assigned JOA-wide operations. These decisions will typically change as the phase of an operation changes. As with any joint capable asset,

the JFC retains the authority to utilize any UAS asset to meet the needs of the JFC mission. How theater-capable UAS operations are managed and planned will vary based on the type and phase of an operation.

(b) **Factors to Consider When Tasking UASs.** Users requesting UA support should make a concerted effort to request UA in the role of ISR (see paragraph 7, “Intelligence, Surveillance, and Reconnaissance Considerations”) or, as an armed UA, in which case a desired effect is requested. Depending on the desired effect, there might be more than one type of asset available to support a mission requiring armed UA. UASs are typically high demand assets due to mission duration, the ability to quickly respond to TST requests, and their ability to support multiple users. Retasking a UAS during mission execution must be carefully considered. Dynamic retasking of a UAS should be done by the appropriate commander after evaluating the full impact of diverting the capability from the current mission and the impact to operational success or consequences without the asset. Dynamic UAS retasking priorities and procedures must be clearly specified in the ROE and SPINS prior to conducting military operations.

(c) **Transfer of Control During Mission Execution.** If a UAS or the payload is reallocated to support another commander’s objective, the supported commander should, to the maximum extent feasible, take advantage of the established C2 architecture. This will alleviate the necessity for the supported commander to understand how assets or payloads, not under his routine command, are controlled (as opposed to how they can be used). If it is necessary to control an asset by anyone other than the primary UAS operator (e.g., the supported commander wants to control which way to direct an electro-optical infrared camera), then they should be familiar with joint terminology for controlling the UAS and payload. To adapt to UAS transfer of control, intelligence collection managers and ISR operations managers will need to adjust plans and reprioritize available ISR assets and capabilities.

(d) **UAS C2 for Dynamic Targeting.** Recent operations have demonstrated that UASs can be critical to the success of dynamic targeting missions and its prosecution of targets of opportunity (unplanned, unanticipated) or TSTs. Commanders of UASs should follow established procedures for executing dynamic targeting operations. Dynamic targeting situations may require UASs to support CAS, strike coordination and reconnaissance, air interdictions, other joint fires missions, and PR. Specific tasks for the UAS may include: target acquisition/marketing, terminal guidance of ordnance, providing precision coordinates for Global Positioning System (GPS) aided munitions, delivery of onboard precision-guided ordnance, tactical assessment, BDA, and retargeting (i.e., “shoot-look-shoot”). In the dynamic targeting role, UASs are routed, controlled, and deconflicted in the same manner as fixed- and rotary-winged manned aircraft, as outlined in joint doctrine.

c. **Mission Planning Considerations.** Current doctrinal planning considerations for manned aircraft are applicable to UA, with minor modification.

(1) **Flight Planning.** UA flights must follow all approved planning, guidance, and procedures as prescribed in the AOD, ACO, ATO, and SPINS. Typically, it is not necessary to include Group 1 UA on the ACO, ATO, or SPINS **unless their planned operating altitude is such that it could cause a conflict with other airborne operations.** All other UA (Groups 2-5) shall be included on the ACO, ATO, and SPINS. The unique requirements of UAS data links require detailed planning for lost link and/or emergency recoveries.

(2) **UA Emergency Planning.** UA emergency procedures may be more difficult than those of manned platforms. Detailed planning for lost link; lost positioning, navigation, and timing (PNT) self-awareness (typically due to GPS signal interference); and other emergency procedures and recoveries is required due to the dependence on PNT information and the control data link. Planned lost link and emergency profiles must be safe and consistent with all airspace requirements, follow ACO guidance, and deconflict with other airspace users. Another emergency planning factor is the potential for recovery of armed UA into an emergency divert base. Typically the divert base will incorporate a compatible launch and recovery element to ensure safe UA recovery.

d. **Defensive Considerations.** Our adversaries are developing and acquiring UASs, so **it is imperative our C2 and DCA nodes are able to differentiate between friendly and enemy UAs and cruise missiles.** ACPs must not allow a window of opportunity for adversaries to exploit. Specifically, the use of coordinating altitudes and standard use Army aircraft flight routes by UASs enables efficient and timely use of the airspace, but also makes it more difficult for air defense operators to differentiate between friend and foe. This type of airspace control is typically procedural control, and not positive control. Therefore, UAS operators must follow prescribed airspace control procedures and air defense identification procedures in order to prevent fratricide and/or allow enemy UAS exploitation of that airspace. Additionally, the use of coordinating altitude penetrating restricted operations zones (ROZs) to separate UASs from other airspace should be kept to a minimum. A ROZ should be used as an integration tool, not as a segregation tool. When a ROZ is utilized for other than its intended purpose (as a “space holder,” for example), it becomes an inefficient use of airspace that complicates the ACA duties.

For a more detailed discussion of UAS considerations, see the Field Manual (FM) 3-04.15/Navy Tactics, Techniques, and Procedures (NTTP) 3-55.14/Air Force Tactics, Techniques, and Procedures (Instruction) (AFTTP[I]) 3-2.64, Multi-Service Tactics, Techniques, and Procedures for Tactical Employment of UAS.

10. Joint Personnel Recovery Considerations

Since PR operations often rely on air assets to accomplish some of the PR execution tasks, coordination between the joint personnel recovery center (JPRC) and JAOC is essential. The JPRC is responsible for providing the information that goes into the PR portion of the ATO SPINS. The JFACC should ensure the ATO includes air assets sufficient to accomplish PR tasks. Deconfliction of PR missions from other air missions is accomplished through the ATO. If the JPRC is not collocated and integrated into the

JAOC, it is essential the JPRC director establish a liaison element within the JAOC to facilitate tasking of dedicated PR assets in the ATO, coordinate tasking or redirection of air assets to support PR mission execution, monitor ATO and PR mission execution, coordinate changes to PR information in the ATO SPINS, assess the effectiveness of PR operations, and recommend changes to JFC/JFACC guidance for PR. Service components should establish a personnel recovery coordination cell/rescue coordination team (PRCC/RCT) to coordinate all component PR activities. When the JFACC is the supported commander for PR, the PRCC/RCT and associated communications structure may be collocated and form the nucleus of the JPRC. In this case, the PRCC/RCT, when augmented by other members of the joint force, is normally designated as the JPRC and the JPRC director is tasked with coordinating all PR joint activities. Coordination of PR missions, employing JFACC assets, requires integration with the J-3 and COD.

For additional information on joint personnel recovery, see JP 3-50, Personnel Recovery.

APPENDIX A

SAMPLE MISSION STATEMENT AND COMMANDER'S INTENT

The initiation or mission analysis stages of the JOPPA should produce a mission statement and a statement of the commander's intent, both approved by the JFACC.

SAMPLE MISSION STATEMENT:

“When directed, JFACC-West conducts joint air operations in the Pacific region to protect the deployment of the joint force and to deter aggression.

Should deterrence fail, JFACC-West, on order, gains air superiority in order to enable coalition military operations within the operational area. Concurrently, JFACC-West supports JFLCC-West in order to prevent seizure of NV Pacifica mineral fields.

On order, JFACC-West shapes the operational environment for a joint counteroffensive, supports JFMCC-West for maritime superiority and JFLCC-West for ground offensive operations, degrades conventional military power, and destroys weapons of mass destruction long/medium delivery capability in order to defeat the military forces in the region.”

SAMPLE STATEMENT OF COMMANDER'S INTENT:

Purpose. The purpose of the joint air operation is to deter aggression. Should deterrence fail, I will gain and maintain air superiority, conduct joint offensive air operations, and support the JFLCC counteroffensive in order to restore the territorial integrity and ensure the establishment of a legitimate government in a stable Pacifica region.

Military End-state. At the end of this operation:

- a. Adversary military forces will be capable of limited defensive operations, have ceased offensive combat operations, and complied with coalition war termination conditions.
- b. Adversary will retain no weapons of mass destruction capability.
- c. Allied territorial integrity will be restored.
- d. JFACC-West will have passed air traffic control to local authorities.
- e. JFACC-West will have been disestablished.

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APPENDIX B SAMPLE JOINT AIR ESTIMATE OF THE SITUATION

1. Introduction

The JFACC's estimate of the situation is often produced as the culmination of the air COA development and selection stages of the JOPPA. It can be submitted in response to or in support of creation of a JFC's estimate of the situation. It should also be used to assist in creation of the JAOP and daily AODs (as required). It reflects the JFACC's analysis of the various air COAs that may be used to accomplish the assigned mission(s) and contains the recommendation for the best air COA. The estimate may contain as much supporting detail as needed to assist further plan development, but if the air estimate is submitted to the JFC or CCDR for a COA decision, it will generally be submitted in greatly abbreviated format, providing only the information essential to the JFC for arriving at a decision. The following is a **notional** example of a joint air estimate in paragraph format. Use of the format is desirable, but not mandatory and may be abbreviated or elaborated where appropriate. It is often published in message format.

For additional information see Chairman of the Joint Chiefs of Staff Manual (CJCSM) 3122.01, Joint Planning and Execution System (JOPES) Volume I, Planning Policies and Procedures.

2. Sample Joint Air Estimate of the Situation

a. **Mission.** State the assigned or deduced mission and its purpose.

(1) JFC's mission statement (from the JFC's estimate), or other overarching guidance if the latter is unavailable.

(2) JFACC's mission statement. Include additional language indicating how overarching guidance will be supported, as required.

b. **Situation and Courses of Action**

(1) Commanders' Intent:

(a) JFC's intent statement, if available (or other overarching guidance stipulating the end state, as required).

(b) JFACC's intent statement (see Appendix A, "Sample Mission Statement and Commander's Intent").

(2) Objectives. Explicitly state air component objectives and the effects required to support their achievement. Include as much detail as required to ensure that each objective is clear, decisive, attainable, and measurable.

(3) Summary of the results of JIPOE. Include a brief summary of the major factors pertaining to the characteristics of the operating environment and the relative capabilities of all actors within it that may have a significant impact on alternative air COAs.

(4) Adversary capability. Highlight, if applicable, the adversary capabilities and psychological characteristics that can seriously affect the accomplishment of the mission, giving information that would be useful in evaluating the various air COAs. This section should describe, at a minimum, the enemy's most likely and most dangerous potential COAs.

(5) Force protection requirements. Describe potential threats to friendly forces, including such things as the threat of terrorist action prior to, during, and after the mission that can significantly affect accomplishment of the mission.

(6) Own courses of action. List air COAs that offer suitable, feasible, and acceptable means of accomplishing the mission. If specific air COAs were prescribed in the WARNING ORDER, they must be included. For each air COA, the following specific information should be addressed:

(a) Combat forces required. List capabilities needed, and, if applicable, specific units or platforms. For each, list the following, if known:

1. Force provider.
2. Destination.
3. Required delivery date(s).
4. Coordinated deployment estimate.
5. Employment estimate.
6. Strategic lift requirements, if appropriate.

(b) ISR forces required. List capabilities needed, and, if applicable, specific units or capabilities.

(c) Support forces required. List capabilities needed, and, if applicable, specific units or capabilities.

c. Analysis of Opposing Courses of Action. Highlight adversary capabilities and intent (where known) that may have significant impact on friendly COAs.

d. Comparison of Own Courses of Action. For submission to the JFC, include only the final statement of conclusions and provide a brief rationale for the favored air

COA. Discuss the relative advantages and disadvantages of the alternative air COAs if this **will assist the JFC in arriving at a decision.**

e. **Recommended Course of Action.** State the JFACC's recommended COA.

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APPENDIX C SAMPLE JOINT AIR OPERATIONS PLAN FORMAT

The JAOP format uses the same format as the JFC's OPLAN but from an air power point of view. Each air operations plan will differ with the JOA, situation, and capabilities of the joint force. A sample format follows:

Copy No.
Issuing Headquarters
Place of Issue
Date/Time Group of Signature

JOINT AIR OPERATIONS PLAN: (Number or Code Name)

REFERENCES: Relevant documents, maps, and charts. This should generally include CJCSM 3122.03C, *JOPES Volume II, Planning Formats*.

1. SITUATION

Briefly describe the situation that the plan addresses (see the JFC's estimate and the template below as a guide). Related OPLAN(s) should be identified, as appropriate.

a. **General Guidance.** Summarize the operational environment and overall JFC mission, guidance, intent, prioritized effects, operational limitations, and specified tasks for the JFACC and established support relationships among components that are relevant to that guidance.

b. **Area of Concern.** Applicable boundaries, as of the operational area(s), area(s) of interest, and etc. Include maps as appropriate.

c. **Deterrent Options.** Describe air power's role in these JFC options, if applicable.

d. **Adversary Forces.** Overview of the hostile threat, to include:

(1) Composition, location, disposition, movement, of major adversary forces and capabilities that can influence action in the operational environment.

(2) Adversary strategic concept (if known): should include adversary's perception of friendly vulnerabilities and adversary's intention regarding those vulnerabilities.

(3) Major adversary objectives (strategic and operational).

(4) Adversary commanders' motivations, thought patterns, idiosyncrasies, and doctrinal patterns (to the extent known).

(5) Operational and sustained capabilities (all relevant adversary forces, not just air and counterair).

(6) Adversary COGs and decisive points.

(a) Analysis of critical capabilities (CCs), critical requirements (CRs), and critical vulnerabilities (CVs) for each.

(b) Description using logical LOOs, if appropriate.

e. **Friendly Forces.** Overview of friendly (US and coalition partner), to include:

(1) Forces available according to time-phased force and deployment data considerations.

(2) Forces required, based on employment CONOPS. Highlight shortfalls.

(3) Intent of higher, adjacent, and supporting US and coalition forces and commands.

(4) Friendly COGs.

(a) Analysis of CCs, CRs, and CVs.

(b) Steps to be taken to protect friendly CVs.

f. **Assumptions.** List, as required.

g. **Legal Considerations.** List those of critical importance to operations, such as legal restrictions and guidance on targeting. Refer to Annexes, as required.

2. MISSION

JFACC's Mission Statement

3. EXECUTION

a. **Concept of Operations for Joint Air Operations.** A statement of the JFACC's intent, objectives, desired effects, and broad employment concepts, to include logical LOOs for the desired end state. Phase plans for each phase of the operation.

(1) Operational concept for the phase, including objectives (ongoing and specific to the phase), intent, desired effects, risk, logical LOOs, plan of operations, timing, and duration.

(2) General guidance for subordinate units and component's supported and supporting requirements. Ensure that all subordinates' missions are complementary.

(3) Forces or capabilities required by objective.

(4) "Be prepared to" missions; phase branches.

(5) Reserve capabilities and/or forces, if applicable – reserve in this sense meaning capabilities held in operational reserve, not Reserve Component elements of the joint force.

(6) Mobility considerations for the phase – transportation, lines of communications, overflight, basing considerations, and the like that are unique to this phase.

(7) Information operations – considerations, such as deception, strategic communication, and cyberspace capabilities that are unique to the phase.

b. **Tasks.** State the component's supporting and supported requirements for the operation in general. Include implied tasks and guidance to subordinates that are not specific to a given phase.

c. **Coordinating Instructions.** Explain operational terms required for complete understanding of the operation, but which are not defined in current JPs.

d. **Exchange of liaison officers.** Explain and direct any liaison requirements here, including the role of the JACCE.

4. ADMINISTRATION AND LOGISTICS

a. **Concept of Sustainment.** A broad statement of the functional areas of logistics, transportation, personnel policies, and administrations, if required.

b. **Logistics.** Broad sustainment concept for air operations. Phase considerations (synchronized with execution phases – may not be required if already explained in phase plans).

(1) Basing and Overflight. Explain any unique clearance and buildup requirements in this section, if not already explained in phase plans.

(2) Lines of Communications. Explain any requirements relevant to the operation.

(3) Base Opening and Development. Explain any general base opening requirements for the operation. Information may also be included in phase plans.

(4) Maintenance and Modification. Use as required.

(5) Host Nation Considerations. Explain any unique requirements for the operation.

(6) Reconstitution of Forces. Use as required.

(7) Inter-Service, Interagency, and Inter-Component Requirements. Use as required.

(8) Foreign Military Assistance. Use as required.

c. **Personnel.** Use as required.

d. **Public Affairs.** Identify key public affairs requirements necessitated by major event (may also be identified in phase plans).

e. **Civil Affairs.** Use as required.

f. **Meteorological and Oceanographic.** Explain factors like climate and terrain, and how they will likely affect air operations.

g. **Geospatial Information.** Explain common geospatial reference system requirements and plans here.

h. **Medical Services.** Use as required.

5. COMMAND AND CONTROL

a. **Command**

(1) Command Relationships. Specify command relationships for all organizations relevant to the JFACC operations. Be as specific as possible.

(2) Memoranda of Understanding. As applicable.

(3) Command Headquarters. Designation and location of all air-capable command headquarters.

(4) Continuity of Operations. Any general considerations unique to the operation.

(5) Command Posts. List the designations and locations of each major headquarters.

(6) Succession to Command. Designate, in order of succession, the commanders responsible for assuming command of the operation in specific applicable circumstances.

b. **Control and Communications.** General overview of C2 and communication systems required to support air operations.

6. ANNEXES

JAOP annexes should be written for a functional domain-specific audience and contain technical details necessary for C2 of all air organizations and capabilities across the joint force. They should contain any details not considered appropriate for the relevant section of the main plan.

A. **Task Organization.**

B. **Intelligence.**

C. **Operations.**

D. **Logistics.**

E. **Personnel.**

F. **Public Affairs.**

G. **Civil Affairs.**

H. **Meteorological and Oceanographic Operations.**

J. **Command Relationships.**

K. **Communications and Information.**

L. **Environmental Considerations.**

M. **Geospatial Information and Services.**

N. **Space Operations.**

P. **Host-Nation Support.**

Q. **Medical Services.**

S. **Special Technical Operations.**

V. Interagency Coordination.

Y. Strategic Communication.

(Signed) (Commander)

DISTRIBUTION:
SECURITY CLASSIFICATION.

APPENDIX D
SAMPLE AIR OPERATIONS DIRECTIVE

Issuing Headquarters
Place of Issue
Period AOD applies to
Date/Time Group of Signature

1. Situation

- a. JFC guidance (verbatim).
 - (1) JFC's intent statement.
 - (2) Execution guidance (if issued).
 - (3) Supported and supporting command relationships.
- b. Enemy situation.
- c. Friendly situation (by joint force component).

2. Mission

The JFACC's mission statement (verbatim). Covers all phases of the operation, but AOD may state which phase this AOD applies to. This should not change unless the mission itself changes.

3. Execution – Air Operations

- a. JFACC's intent.
 - (1) Purpose.
 - (2) End state.
- b. Execution: What to do, when.
- c. Focus of effort by objective.
- d. Weight of effort by objective.
- e. Acceptable level of risk.
- f. TST guidance.
- g. Other issues (e.g., ISR, IO, space, mobility, focus of effort).

4. Administration and Logistics

Logistics considerations affecting operations during the AOD period.

5. Command and Control

C2 considerations affecting operations during the AOD period. If there are no unique considerations, refer the reader to the JAOP, Appendix J.

6. Annexes

Use as required. Typical annexes:

- a. Full listing of end state conditions, objectives, effects, and tasks, including measures of performance and effectiveness for each (as applicable).
- b. Commander's critical information requirements and essential elements of information applicable for the AOD period.

APPENDIX E SAMPLE AIRSPACE CONTROL PLAN

The following is a **notional** example of an airspace control plan (ACP). Details may vary according to the situation.

Headquarters, JFACC

(a) JAOC Name and Office Symbol

Headquarters, Base, or Location
DD MMM YYYY

APPENDIX X TO ANNEX C TO [Operation Name] JAOP XX-XX, AIRSPACE CONTROL PLAN

[Operation name] AIRSPACE CONTROL PLAN [Number] (ACP XX-XX).

EFFECTIVE UPON ORDER BY THE JOINT FORCE COMMANDER (JFC) AND FOR THE DURATION OF [Operation Name]. RETAIN THIS DOCUMENT THROUGHOUT THE OPERATION. THE DAILY AIRSPACE CONTROL ORDER (ACO) IS IN EFFECT Time Zulu (Z)-Time_Z (Time Local [L] Time-L) EACH DAY, COINCIDING WITH THE AIR TASKING ORDER (ATO) EFFECTIVE TIMES. DOCUMENT LENGTH: X PAGES.

THIS DOCUMENT IS UNCLASSIFIED.

REFERENCES:

JP 3-52, *Joint Airspace Control*.

JP 1, *Doctrine For The Armed Forces Of The United States*.

Air Force Tactics, Techniques, and Procedures 3-3.AOC, *Operational Employment, Air and Space Operations Center*.

[Operation name] AIRSPACE MASTER DATA BASE, DAILY ACO, ACMREQ FORM, ACP AND AIRSPACE POWERPOINT SLIDES DEPICTING ESTABLISHED AIRSPACE AND COORDINATE INFORMATION CAN BE FOUND ON THE [Operation or Command Name] WEB PAGE ON SIPRNET LOCATED AT: (<https://XXX.XXX>)

INDEX OF THE ACP SECTIONS:

ALPHA: Basic Plan
A1. Scope
A2. Definition Of Airspace Control
A3. Primary Airspace Control Responsibilities
BRAVO: Special Procedures
CHARLIE: Points Of Contact
DELTA: Functional Responsibilities
ECHO: ACM Request/ACO Promulgation Procedures

FOXTROT: ATC Equipment Defined
GOLF: Abbreviations And Definitions
HOTEL: Airspace Coordinating Measures (ACM)

SECTION ALPHA: BASIC PLAN

A1. SCOPE: Information in this plan does not replace airfield or airspace local operating procedures, the flight information publication (FLIP), or service and/or national flight operations regulations.

A2. DEFINITION OF AIRSPACE CONTROL:

A2.2.1. OBJECTIVE: To enhance air, land, maritime, and special operations force effectiveness in accomplishing the joint task force's (JTF's) objectives. This is accomplished with the maximum allowable freedom to airspace users consistent with the JTF's determination of acceptable risk. Airspace control includes coordinating, integrating, and regulating airspace to increase operational effectiveness; however, the airspace control authority (ACA) does not have the authority to approve, disapprove, or deny combat operations. Such authority is vested in operational commanders.

A2.2. TYPES OF AIRSPACE CONTROL: control of airspace will be accomplished by two primary means: procedural control and positive control.//

A2.2.1. Procedural control is that method of airspace control which relies on previously agreed to airspace control measures or procedures which are promulgated in the ACP, ACO or air traffic control (ATC) guidance (i.e., ROZ, track, orbit).

A2.2.2. Positive control is that method of airspace control that relies on real-time surveillance and guidance of an airspace user by an authorized airspace control agency (e.g., ATC, control and reporting center [CRC], airborne warning and control system [AWACS]).

A3. PRIMARY AIRSPACE CONTROL RESPONSIBILITIES

A3.1. Joint force air component commander (JFACC): Designated by the JFC to accomplish missions and tasks assigned by the JFC to meet JFC objectives. [Rank, Name, Office] IS DESIGNATED AS THE [Operation Name] JFACC.//

A3.2. ACA: The ACA is responsible for the operation of the ACS in the airspace control area and develops the ACP for JFC approval and promulgation. [Rank, Name], [Operation Name] JFACC, is designated as the ACA with headquarters in the joint air operations center (JAOC). The airspace control cell of the JAOC will act as the focal point for JTF airspace issues. Modifications to

the ACP or the airspace structure will be published in the ACO or special instructions (SPINS).

A3.3. Battlefield coordination detachment (BCD): The BCD is the primary interface between the US Army component commander and the JFACC. The BCD coordinates ARFOR airspace management needs with the JAOC when the JFACC is also designated the ACA. These airspace requirements are generated through the AAGS. The BCD coordinates the use of airspace by ground-based fire support systems, especially rockets and missiles, and with other airspace users such as aviation, UAS, and supporting aircraft. The commander, ARFOR is responsible for identifying any required ACMs and FSCMs to both facilitate fires and protect other airspace users. The Army identifies airspace requirements and submits ACMREQs to the BCD. The BCD coordinates the ACMs and designated FSCMs with the ACA's Airspace Management Team to ensure they are included in the ACO per the ACP guidance. The BCD will notify the JAOC ACA representative about immediate airspace requirements during combat operations if required. The NRT airspace integration is conducted by Army AC2 elements with the ACA's ACS per the ACP.

A3.4. Airspace users: Any user of airspace, to include operators of aircraft, UASs, artillery, missiles, or other flying objects. Airspace users will adhere to airspace guidance promulgated in the ACP, ACO or spins while operating within the [Operation Name] operational area. Airspace users will adhere to host nation ATC procedures while operating outside of the [Operation Name] operational area.

SECTION BRAVO: SPECIAL PROCEDURES

B1. AIR TRAFFIC CONTROL PROCEDURES.

B1.1. GENERAL.

B.2. COORDINATING ALTITUDE. To provide deconfliction between fixed- and rotary-wing operations, the coordinating altitude for the joint operations area (JOA) is XXXX feet above ground level (AGL).

B.3. IDENTIFICATION PROCEDURE:

B.3.1. Aircraft penetrating friendly airspace must be classified (friendly, unknown, or hostile) within X minutes of initial detection.

B.4. HELICOPTER PROCEDURES. All rotary-wing aircraft will use see and avoid deconfliction procedures at all times.

B.5. TRANSITION ALTITUDE.

B.6. SPECIAL USE AIRSPACE.

B.7. DEGRADED OPERATIONS.

B.8. IDENTIFICATION FRIEND OR FOE/SELECTIVE IDENTIFICATION FEATURE (IFF/SIF) MODE III PROCEDURES.

B.8.1. IDENTIFICATION OF HELICOPTERS:

B.9. EMERGENCY PROCEDURES.

B.10. WEATHER AVOIDANCE.

B.11. DIVERT/FUEL DUMPING PROCEDURES.

B.12. CORRIDORS AND ROUTES:

B.12.1. CORRIDORS.

B.12.2. SAFE PASSAGE.

B.12.3. LAME DUCK PROCEDURES. (A lame duck aircraft is defined as an aircraft that is unable to talk, squawk and navigate along promulgated minimum risk routes [MRRs]).

B.13. UNMANNED AIRCRAFT SYSTEMS.

B.13.1. ESTABLISHING AIRSPACE PARAMETERS.

B.13.2. UAS DECONFLICTION. Deconfliction will be accomplished using ACMs to segregate UASs from other airspace users.

B.13.3. REAL-TIME DECONFLICTION PROCEDURES.

B.13.3.1. UAS WITH IFF.

B.13.3.2. UAS WITHOUT IFF.

B.13.4 – X.GUIDANCE FOR SPECIFIC TYPES OF UASs.

B.14. C2 AND ISR PLATFORMS AND UNMANNED AIRCRAFT.

B.14.1. IN-FLIGHT DECONFLICTION PRIORITY.

B.14.2. RESPONSIBLE AGENCIES FOR DEPARTURE, ARRIVAL, EN-ROUTE/OPS AREA DECONFLICTION.

B.14.3. EN-ROUTE DECONFLICTION PROCEDURES TO OPERATIONS AREA.

B.15. MONITORING AGENCIES.

SECTION CHARLIE: POINTS OF CONTACT.

C.1. Specific points of contact, as required by the operation. Include email and internet contact points.

C.2. CHANGES TO THE ACP should be disseminated by separate message as required. Proposed changes must be submitted to JFACC airspace management team (AMT) in the JAOC at [Location].

C.2.1. METHODS TO REQUEST UNCLASSIFIED CHANGES.

C.2.2. METHODS TO REQUEST CLASSIFIED CHANGES.

SECTION DELTA: AIRSPACE CONTROL ORDER.

D.1. JOINT FORCE AIR COMPONENT COMMANDER. Airspace-specific duties and responsibilities of the JFACC, as well as required information on who has been appointed as the JFACC and what command arrangements have been made to support him or her.

D.2. AIRSPACE CONTROL AUTHORITY. Location and required details on the ACA.

D.3. AIRSPACE MANAGEMENT TEAM (AMT). Location and required details about the AMT within the JAOC.

D.4. COORDINATION AND DECONFLICTION PROCEDURES WITH OTHER JOINT FORCE COMPONENTS.

SECTION ECHO: ACM REQUEST / ACO PROMULGATION PROCEDURES.

E.1. INTRODUCTION.

E.1.1. THE JOINT OPERATIONS AREA DEFINED.

E.1.2. OVERFLIGHT CONSIDERATIONS.

E.1.3. SPECIAL TARGET RESTRICTIONS.

E.2. SUBMISSION RESPONSIBILITIES AND PROCEDURES.

E.3. ACM REQUESTING PROCEDURES.

E.4. ACM COORDINATION PROCEDURES.

E.5. ACO PROMULGATION / DISSEMINATION PROCEDURES.

SECTION FOXTROT: ATC EQUIPMENT DEFINED

F.1. RADAR SERVICES.

F.2. NAVIGATIONAL AIDS (NAVAIDS).

F.3. COMMUNICATION REQUIREMENTS.

F.4. ATC SERVICES

F.5. AIRPORT INFORMATION.

SECTION GOLF: ABBREVIATIONS AND DEFINITIONS

SECTION HOTEL: AIRSPACE COORDINATING MEASURE

H.1 INTRODUCTION.

H.2. AIRSPACE CONTROL DEFINITIONS AND PROCEDURES

H.3. DECONFLICTION PROCEDURES.

H.4. ACM TYPES. (IAW US message text format (USMTF) 2000.)

H.5. ACM USAGE CODES. (USMTF 2000 usage codes)

H.6. NO FLY AREA (NOFLY).

APPENDIX F

JOINT AIR OPERATIONS CENTER DIVISIONS AND DESCRIPTIONS

1. Joint Air Operations Center Director

The JAOC director is charged with effectively managing joint air operations and establishing the JAOC battle rhythm. The JAOC director develops and directs processes to plan, coordinate, allocate, task, execute, and assess joint air operations in the JOA based on JFC and JFACC guidance. The JAOC director's staff includes division chiefs, ATO coordinators, the JAOC manager, information management personnel, and the ATO SPINS coordinator (see Figure F-1).

2. Strategy Division

The SD concentrates on long-range and near-term planning of joint air operations to achieve JFC objectives by developing, refining, disseminating, and assessing the JFACC's strategy. In addition, the SD does near-term planning for space, cyberspace, and IO in coordination with joint air operations. Strategy activities are primarily reflected in the JAOP, AOD, and the operational assessment report. The SD is divided into four teams: strategy plans, strategy guidance, IO, and operational assessment. Despite physical proximity to the ATO planning, production, and execution areas within the JAOC, SD personnel should not become caught up in execution details. Although the IO team is organizationally aligned with the SD, it coordinates IO efforts across all the divisions within the JAOC.

3. Combat Plans Division

The CPD is responsible for near-term air operations planning (within 48 hours prior to ATO execution). The CPD is divided into four teams: TET, MAAP, ATO production, and C2 plans. The TET develops the JFACC's TNL and produces a draft JIPTL for JFC approval. The primary daily products of CPD processes are the ATO and ACO. CPD develops the MAAP, assembles the SPINS, and ISR synchronization matrix. The MAAP team needs the current AOD, ABP shell, and JIPTL loaded to build missions in the proper TBMCS format. The C2 plans team produces the daily ACO, tactical operations data, and operational task link message. The ATO production team develops the ABP databases, and assembles, publishes, and disseminates the ATO, ACO, and SPINS. Additionally, various specialty/support personnel are embedded in the CPD.

4. Combat Operations Division

The COD is responsible for the execution of the current ATO (usually the 24 hours encompassing the effective period of the ATO). The COD is divided into four teams: offensive operations, defensive operations, interface control, and the senior intelligence duty officer (SIDO) team. Additionally, various specialty/support personnel are embedded in the COD.

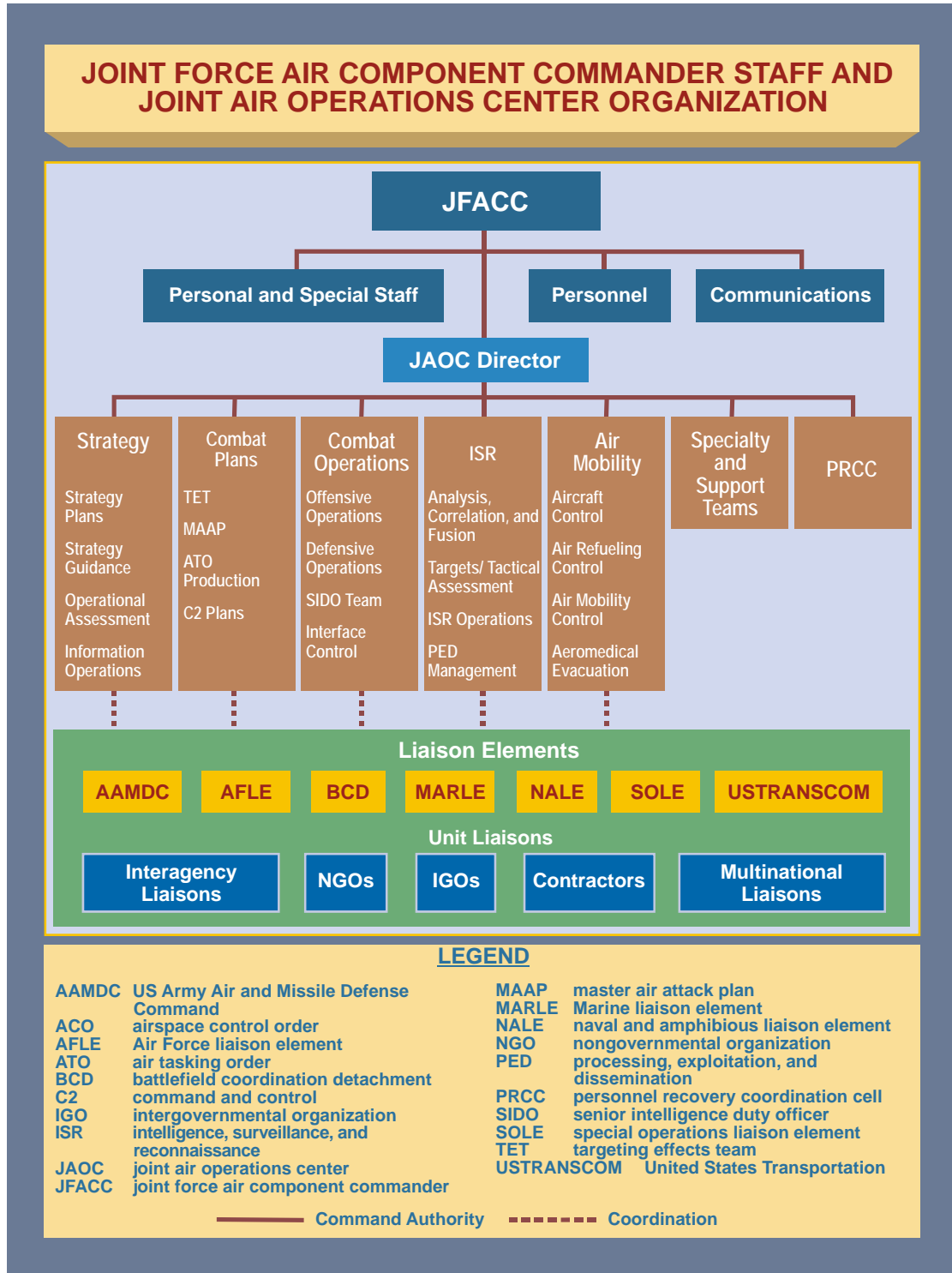


Figure F-1. Joint Force Air Component Commander Staff and Joint Air Operations Center Organization

5. Intelligence, Surveillance, and Reconnaissance Division

For operations in theaters outside the continental United States, the intelligence, surveillance, and reconnaissance division (ISRD) is responsible for providing the JFACC and JAOC with awareness of adversary activity in the operational area, assisting with integrating, planning, and managing airborne ISR operations, developing and maintaining targeting information about the adversary, and assisting with execution of ISR operations. In addition, ISRD has integrated teams or assigned personnel in other JAOC divisions. The ISRD is divided into four teams: analysis, correlation and fusion; targets and tactical assessment; ISR operations; and processing, exploitation, and dissemination team. ISR personnel, assigned in the SD, assist in the development of overall JFACC strategy, JAOP and operational assessment. ISR personnel, assigned in the CPD, provide tailored ISR operations planning, threat analysis, and targeting expertise necessary to develop detailed execution plans for joint air operations. ISR personnel, assigned to the COD, are part of the SIDO team and provide current situational awareness, targeting, and ISR operations management for execution of the ATO.

6. Air Mobility Division

The AMD plans, coordinates, tasks, and executes the air mobility mission in support of the joint air planning and execution process. The AMD consists of four teams: airlift control team (ALCT), air refueling control team (ARCT), air mobility control team (AMCT), and aeromedical evacuation control team (AECT). ALCT plans, schedules, and tasks the theater airlift portion of the ATO. The ARCT plans, schedules, tasks, and assists in execution of air refueling missions. The AMCT manages the execution of the air mobility missions in the ATO and provides support for the overall air mobility effort. The AECT plans, schedules, and monitors execution of AE missions and AE assets to support patient movements. Elements within the AMD are matrixed throughout other divisions.

7. Specialty and Support Functions

Various specialty and support teams provide the JAOC with diverse capabilities to help integrate and orchestrate joint air operations. Examples of these functions include IO, public affairs, PR/combat search and rescue, staff judge advocate, weather, airspace management, and information management. Integration of specialty and support capabilities is crucial to the success of the JAOC and joint air operations.

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APPENDIX G

LIAISON ELEMENTS WITHIN THE JOINT AIR OPERATIONS CENTER

1. Introduction

Liaison between forces is essential for coordinated and effective joint air operations. Component commanders will exchange liaison elements to assist and coordinate the planning and execution of their component's operations with joint air operations. Liaison elements provide senior level interface for air, land, sea, and SOFs. These elements consist of personnel who provide component planning and tasking expertise, coordination capabilities, and the ability to deconflict component operations and joint air operations. A brief summary follows of typical liaison elements. Detailed information can be found in respective command and Service documents.

2. Battlefield Coordination Detachment

The BCD is organized into a headquarters element and six sections (e.g., plans, intelligence, operations, air defense, airspace management, and airlift). The Army allocates one BCD per Army service component command (ASCC). The BCD may support the ASCC or be tailored to support the senior ARFOR deployed commander's operations. BCD coordinates with and receives objectives, guidance, and priorities from the ARFOR commander and staff. Specific missions include processing requests for tactical air support, monitoring and interpreting the land battle situation, providing the necessary interface for the exchange of current intelligence and operational data, coordinating air and missile defense, and airspace management with the JAOC. It expedites information exchange through face-to-face coordination with JAOC division/teams because the BCD personnel are trained to operate in the JAOC environment using TBMCS and understand air component processes. Additionally, the BCD supervises the Army air reconnaissance LNO teams and Army ground LNO augmentation teams that coordinate Army forces with Air Force reconnaissance, fighter, and airlift wings.

3. Special Operations Liaison Element

The JFSOCC provides a SOLE to the JFACC, or appropriate Service component air C2 facility, to coordinate and synchronize SOF, air and surface operations with joint air operations. The SOLE director places LNOs throughout the JFACC's staff, located in the JAOC. The SOLE coordinates, integrates, and deconflicts all SOF air, surface, and subsurface activities by providing a SOF presence in the JAOC that is aware of the activities of special operations units in the field. Special operations must be closely coordinated with joint air operations planning and execution to prevent fratricide, and ensure achievement of mission objectives.

For more information on the SOLE, see JP 3-05, Joint Special Operations; JP 3-05.1, Joint Special Operations Task Force Operations; and USSOCOM Directive 535-7, Joint Special Operations Liaison Element.

4. Naval and Amphibious Liaison Element

The NCC/JFMCC (if designated), establishes a NALE to act as the interface between the NCC/JFMCC and the JFACC. The NALE is responsive to the JFACC on matters pertaining to all Navy operations and Marine Corps amphibious operations and provides subject matter experts knowledgeable in the tactics and capabilities of Navy ships, aircraft and weapon systems. The NALE coordinates, integrates, and deconflicts all Navy air and surface activities by providing visibility of maritime operations and targets in the JFACC's AOD, ATO, and ACO. The NALE processes Navy force and Marine Corps landing force requests for air support and monitors and interprets the maritime battle situation in the JAOC. The NALE provides the necessary interface for the exchange of operational and intelligence data. The NALE also coordinates maritime requirements for air defense support, interdiction, and monitors Navy and Marine Corps airspace and air traffic control requirements and changes. The NALE provides feedback to the organizations within the JAOC on current and future joint air operations concerning integration of force requirements.

5. Marine Liaison Element

The MARLE is the Marine Corps forces commander's representative within the JAOC and is responsive to the JFACC on matters pertaining to Marine Corps operations. The MARLE provides feedback to organizations within the JAOC on current and future joint air operations concerning integration of force requirements.

6. Air Force Liaison Element

The AFLE provides an interface between the COMAFFOR and the JFACC for coordinating and synchronizing Air Force units in support of joint air operations if the JFACC is not also the COMAFFOR. Normally, the AFLE is composed of personnel and equipment for a general purpose, numbered Air Force's staff and component organizations. AFLE manning is based on a cadre concept with personnel selected for their battle management expertise and knowledge of C2 concepts and procedures. The cadres are augmented by additional personnel who are specialists knowledgeable in the capabilities and tactics of the aircraft, intelligence, or weapons systems being employed. The AFLE can be tailored to perform a variety of missions and management functions to match the contingency or operation.

7. Army Air and Missile Defense Command Liaison Team

The AAMDC liaison team is the senior Army and air defense element. It is the primary interface for all land-based Army air and theater missile defense operations. The BCD air defense section will coordinate its activities with the AAMDC liaison if required. Although the BCD has an air defense section, responsibility to integrate the ARFOR air and missile defense resides with the senior air defense artillery commander, normally the commander, AAMDC. The AAMDC liaison team responsibilities normally include:

- a. Assisting the AADC with the AADP development.
- b. Integrating land-based air and missile defense into theater defensive operations.
- c. Advising the JFACC/AADC regarding ROE, ACMs related to air defense, weapons control measures, fire control orders, and air defense warnings.
- d. Advising the AADC on matters regarding land-based air and missile defense operations.

8. Other Liaison

Liaisons representing coalition/allied forces or interagency organizations may improve JAOC situational awareness and contribute to unity of effort. They provide invaluable information on their nation's (or agencies) capabilities and sensitivities. They can also help overcome cultural barriers. The JFACC must anticipate the need for LNOs and be prepared to proactively coordinate as appropriate.

See JP 3-0, Joint Operations, and JP 3-16, Multinational Operations, for further discussion on the subject.

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APPENDIX H

THE JOINT AIR COMPONENT COORDINATION ELEMENT

1. General

A JACCE is a small team of airpower experts that can be used to facilitate coordination between a JFACC and other component commanders or the JFC. The JACCE is intended as a facilitator, and should not be used in place of existing, more formal methods of coordination. The JACCE will not bear any responsibilities of the JAOC nor will it replace any JAOC processes or sub-processes. The JAFFAC may simultaneously deploy multiple JACCEs as liaisons to the JTF, subordinate joint forces, or Services, while operating from home station or a deployed location. Some general considerations include:

a. **The JACCE director's rank** should be high enough to work effectively with the JFC or component commander whom they are supporting.

b. **The JACCE director should be supported by a staff.** Its size should reflect the breadth of the operation and normally includes plans, operations, intelligence, airspace management, space, and air mobility. Additionally, administration and communications support may be needed.

(1) The JACCE staff should be representative of the JFACC's staff and should be composed primarily of personnel from the JFACC's Service or component (e.g., if the JFACC is a naval officer and the JAOC is composed primarily of naval personnel, then the JACCE should also be composed primarily of naval personnel).

(2) The JACCE staff should be tailored in expertise to the supported/supporting headquarters.

(a) For example, a JACCE, to a JFLCC who commands a very large land force involved in major combat, should be relatively large and the JACCE should have requisite experience in supporting land operations with joint air power. The JACCE should also understand how land forces can support the air scheme of maneuver.

(b) The JACCE, deployed to a JTF headquarters conducting a humanitarian relief operation, would be composed very differently.

c. **Authority and responsibility** of the JACCE should be tailored to JFACC needs. In some situations the JFACC may give the JACCE significant latitude in their authority to represent the JFACC; in other cases the JFACC may be more restrictive.

d. **Working relationships.** The JFACC should introduce the JACCE director to the supported component commander or JFC to establish the desired working relationship. If this is not possible, the JFACC should at least meet face-to-face with the JACCE prior to the JACCE assuming their duties.

e. **Communications.** A key to the JACCE's success is its ability to communicate and gather information. Better communication should lead to better information and thus to better advice from the JACCE. Some members of the JACCE will require access to special access programs or compartmentalized information and they should deploy with the requisite clearances.

2. Presentation and Command/Control Relationships

Ideally, the JFACC and other component commanders would be located together and there would be no need for a JACCE – the JFACC and other commanders could work side-by-side and talk face-to-face. Headquarters are often not located together, however, so a JACCE is presented to the other commanders in order to bridge that physical separation. The JFACC retains OPCON of the JACCE, but Service components retain administrative control of their personnel within it. There are two general modes of JACCE presentation: internal and external to a JTF.

a. Presentation with JFACC internal to a JTF

(1) In this model the CCDR has established a JTF, the JFACC is subordinate to the commander, JTF, and JACCE are presented as needed laterally to other functional component commanders and upward to the JTF. This is illustrated in Figure H-1.

(2) Although a JSOTF normally includes a JSOACC, the JSOACC is focused on employment of SOF aviation. A JACCE may be required if “conventional” aviation provided by the JFACC is to be integrated with SOF to provide non-SOF capabilities.

b. **Presentation with JFACC external to a JTF.** In this model there is a mix of several JTFs within a theater, but only one fully capable JAOC to service all components. In such instances, there is usually one JFACC reporting to the geographic CCDR. The JFACC provides centralized control of all joint air power across the theater and supports multiple JTFs based on the CCDR's priorities. This arrangement usually occurs because there are insufficient air assets to supply each JTF with adequate air component representation and thus there is no separate air component within the JTFs.

Example 1: Commander of US Central Air Forces, while acting as the combined force air component commander for the Commander of US Central Command, simultaneously provides support to separate joint task forces (JTFs) in Iraq, Afghanistan, and the Horn of Africa.

Example 2: The US Northern Air Forces/First Air Force Commander, acting as the Joint Force Air Component Commander for Operation NOBLE EAGLE in the continental United States (CONUS), may also support separate JTFs responding to separate disasters in CONUS. In this case, if there are very limited Air Force forces operational control to the JTF, then the joint air component coordination element (JACCE) director could be dual-hatted as the commander, Air Force forces, depending on the JACCE director's ability to handle both jobs.

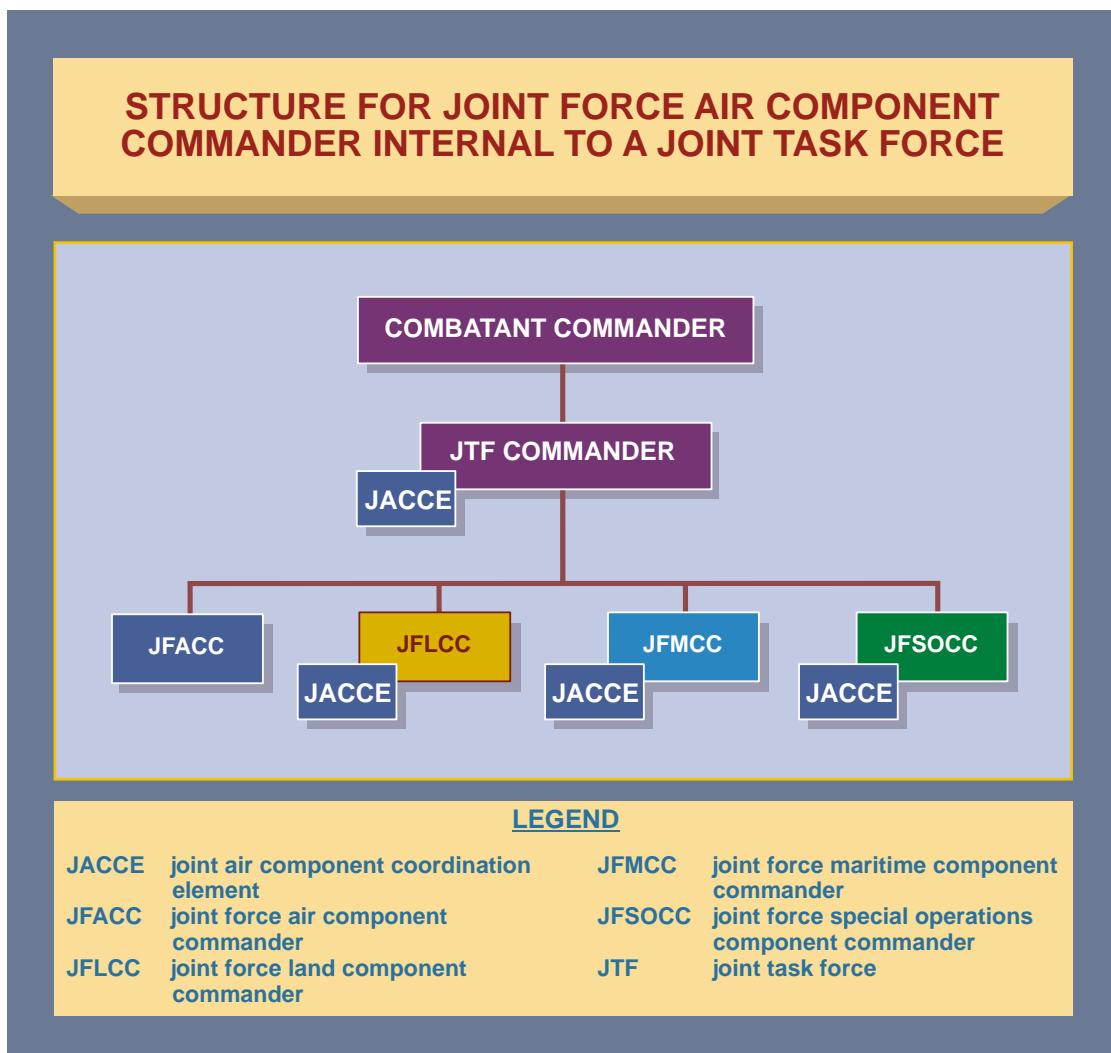


Figure H-1. Structure for Joint Force Air Component Commander Internal to a Joint Task Force

c. **Presentation to Service components.** In those cases when a JFC elects not to designate functional component commanders, the COMAFFOR may provide JACCEs to the other Service component commanders and the JFC as necessary. Duties and relationships remain as stated.

d. **Presentation in multinational operations.** In multinational operations JACCEs may be presented as necessary. The model should be similar to that depicted in Figure H-1 above. (See Figure H-2.)

3. Joint Air Component Coordination Element Authority, Command Relations, and Functions and Responsibilities

The joint air component coordination element:

- a. Derives all authority from the JFACC.

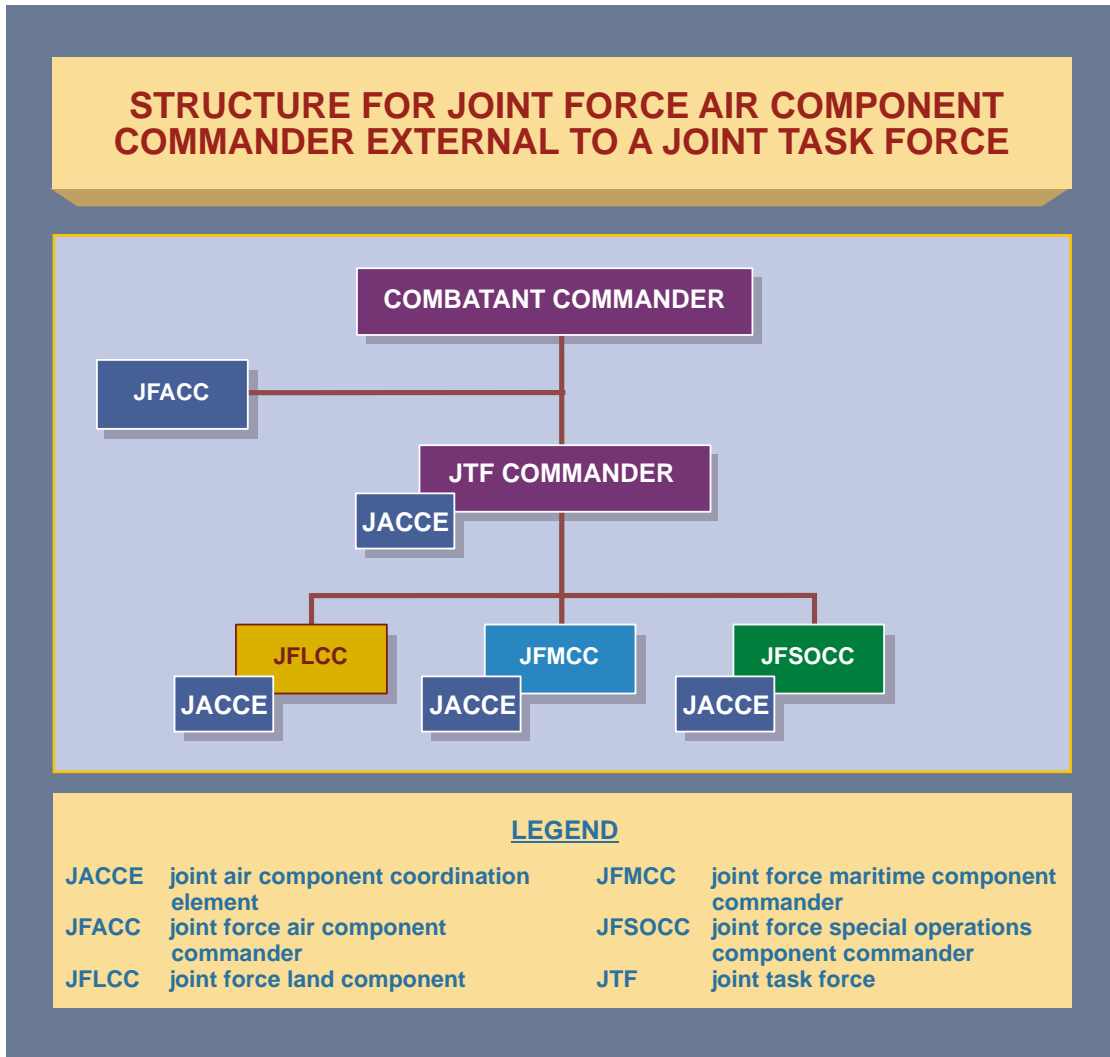


Figure H-2 Structure for Joint Force Air Component Commander External to a Joint Task Force

b. Authority can change over time, depending on operation dynamics.

c. Is presented in a liaison role (not with operational or TACON of forces, or in direct support of the host component commander) and communicates, facilitates, advises, coordinates, and supports the effective interplay between the JFACC and the host commander(s).

d. Communicates:

(1) The host commander's decisions, priorities, interests, and plans to the JFACC.

(2) The JFACC's intent, capabilities, restraints, and air component perspective to the host commander.

e. Advises and assists in planning supporting and supported relationship options.

f. Facilitates the staff process for the JFACC and host commander.

g. Should not replace, replicate, or circumvent in-place request mechanisms (such as target requests, air apportionment, etc.).

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APPENDIX J REFERENCES

The development of JP 3-30 is based upon the following sources:

1. DOD Publications

Department of Defense Directive 5100.1, *Functions of The Department Of Defense And Its Major Components*.

2. CJCS Publications

a. Chairman of the Joint Chiefs of Staff (CJCS) Instruction 3151.01B, *Global Command and Control System Common Operational Picture Reporting Requirements*.

b. CJCSM 3122.01A, *Joint Operation Planning and Execution System (JOPES), Vol. I, Planning Policies and Procedures*.

c. CJCSM 3122.03C, *JOPES, Vol. II, Planning Formats*.

d. JP 1, *Doctrine for the Armed Forces of the United States*.

e. JP 2-0, *Joint Intelligence*.

f. JP 2-01, *Joint and National Intelligence Support to Military Operations*.

g. JP 2-01.3, *Joint Intelligence Preparation of the Operational Environment*.

h. JP 3-0, *Joint Operations*.

i. JP 3-01, *Countering Air and Missile Threats*.

j. JP 3-03, *Joint Interdiction*.

k. JP 3-04, *Joint Shipboard Helicopter Operations*.

l. JP 3-05, *Doctrine for Joint Special Operations*.

m. JP 3-05.1, *Joint Special Operations Task Force Operations*.

n. JP 3-08, *Interorganizational Coordination During Joint Operations*.

o. JP 3-09, *Joint Fire Support*.

p. JP 3-09.3, *Close Air Support*.

q. JP 3-11, *Operations in Chemical, Biological, Radiological, and Nuclear Environments*.

- r. JP 3-13, *Information Operations*.
- s. JP 3-13.1, *Electronic Warfare*.
- t. JP 3-14, *Space Operations*.
- u. JP 3-16, *Multinational Operations*.
- v. JP 3-17, *Air Mobility Operations*.
- w. JP 3-50, *Personnel Recovery*.
- x. JP 3-52, *Joint Airspace Control*.
- y. JP 3-60, *Joint Targeting*.
- z. JP 4-02, *Health Service Support*.
- aa. JP 5-0, *Joint Operation Planning*.

3. Service Publications

- a. AFTTP 3-3.AOC, *Operational Employment – Air and Space Operations Center (U)*.
- b. NTTP 3-03.4, *Naval Strike and Air Warfare*.
- c. FM 3-04.15/ NTTP 3-55.14/AFTTP(I) 3-2.64, *Multi-Service Tactics, Techniques, and Procedures for Tactical Employment of UAS*.
- d. NTTP 3-20.8/AFTTP 3-2.74, *Multi-Service Tactics, Techniques, and Procedures for Air Operations in Maritime Surface Warfare*.

4. United States Special Operations Command Publications

- a. USSOCOM Directive 535-7, *Joint Special Operations Liaison Element*.
- b. USSOCOM Directive 535-8, *Joint Special Operations Air Component*.

APPENDIX K ADMINISTRATIVE INSTRUCTIONS

1. User Comments

Users in the field are highly encouraged to submit comments on this publication to: Commander, United States Joint Forces Command, Joint Warfighting Center, ATTN: Joint Doctrine Group, 116 Lake View Parkway, Suffolk, VA 23435-2697. These comments should address content (accuracy, usefulness, consistency, and organization), writing, and appearance.

2. Authorship

The lead agent for this publication is the US Air Force. The Joint Staff doctrine sponsor for this publication is the J-3.

3. Supersession

This publication supersedes JP 3-30, 5 June 2003, *Command and Control for Joint Air Operations*.

4. Change Recommendations

a. Recommendations for urgent changes to this publication should be submitted:

TO: LEMAY CENTER MAXWELL AFB AL//CC//
INFO: JOINT STAFF WASHINGTON DC//J7-JEDD//
CDRUSJFCOM NORFOLK VA//DOC GP//

Routine changes should be submitted to the Commander, Joint Warfighting Center – Doctrine and Education Group, and info the Director for Operational Plans and Joint Force Development (J-7)/JEDD, via the CJCS JEL at <http://www.ditc.mil/doctrine>.

b. When a Joint Staff directorate submits a proposal to the Chairman of the Joint Chiefs of Staff that would change source document information reflected in this publication, that directorate will include a proposed change to this publication as an enclosure to its proposal. The Military Services and other organizations are requested to notify the Joint Staff/J-7 when changes to source documents reflected in this publication are initiated.

c. Record of Changes:

| CHANGE NUMBER | COPY NUMBER | DATE OF CHANGE | DATE ENTERED | POSTED BY | REMARKS |
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6. Distribution of Electronic Publications

a. Joint Staff J-7 will not print copies of JPs for distribution. Electronic versions are available on JDEIS at <https://jdeis.js.mil> (NIPRNET), and <https://jdeis.js.smil.mil> (SIPRNET) and on the JEL at <http://www.dtic.mil/doctrine> (NIPRNET).

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c. CD-ROM. Upon request of a JDDC member, the Joint Staff J-7 will produce and deliver one CD-ROM with current JPs.

GLOSSARY

PART I — ABBREVIATIONS AND ACRONYMS

| | |
|----------|--|
| AADC | area air defense commander |
| AADP | area air defense plan |
| AAGS | Army air-ground system |
| AAMDC | US Army Air and Missile Defense Command |
| ABP | air battle plan |
| AC2 | airspace command and control |
| ACA | airspace control authority |
| ACE | aviation combat element |
| ACM | airspace coordinating measure |
| ACO | airspace control order |
| ACP | airspace control plan |
| ACS | airspace control system |
| ADAM | air defense airspace management |
| AE | aeromedical evacuation |
| AECT | aeromedical evacuation control team |
| AETF | air and space expeditionary task force |
| AFLE | Air Force liaison element |
| AFTTP | Air Force tactics, techniques, and procedures |
| ALCT | airlift control team |
| ALLOREQ | allocation request |
| AMCT | air mobility control team |
| AMD | air mobility division |
| AOC | air and space operations center (USAF) |
| AOD | air operations directive |
| AOR | area of responsibility |
| ARCT | air refueling control team |
| ARFOR | Army forces |
| ASCC | Army Service component command |
| ASOC | air support operations center |
| ATO | air tasking order |
| | |
| BAE | brigade aviation element |
| BCD | battlefield coordination detachment |
| BDA | battle damage assessment |
| | |
| C2 | command and control |
| CAS | close air support |
| CC | critical capability |
| CCDR | combatant commander |
| CDRJSOTF | commander, joint special operations task force |
| CJCSM | Chairman of the Joint Chiefs of Staff manual |
| CMA | collection management authority |
| COA | course of action |
| COD | combat operations division |
| COG | center of gravity |

| | |
|-----------|---|
| COMAFFOR | commander, Air Force forces |
| CONOPS | concept of operations |
| CPD | combat plans division |
| CR | critical requirement |
| CV | critical vulnerability |
| CWC | composite warfare commander |
| | |
| DAL | defended asset list |
| DASC | direct air support center |
| DCA | defensive counterair |
| DIRMOBFOR | director of mobility forces |
| | |
| FM | field manual (Army) |
| FSCL | fire support coordination line |
| | |
| GCC | geographic combatant commander |
| GPS | Global Positioning System |
| | |
| IGO | intergovernmental organization |
| IO | information operations |
| IPB | intelligence preparation of the battlespace |
| ISR | intelligence, surveillance, and reconnaissance |
| ISRD | intelligence, surveillance, and reconnaissance division |
| | |
| J-2 | intelligence directorate of a joint staff |
| J-3 | operations directorate of a joint staff |
| J-4 | logistics directorate of a joint staff |
| JACCE | joint air component coordination element |
| JAOC | joint air operations center |
| JAOP | joint air operations plan |
| JDDOC | joint deployment and distribution operations center |
| JFACC | joint force air component commander |
| JFC | joint force commander |
| JFLCC | joint force land component commander |
| JFMCC | joint force maritime component commander |
| JFSOCC | joint force special operations component commander |
| JIPCL | joint integrated prioritized collection list |
| JIPOE | joint intelligence preparation of the operational environment |
| | |
| JIPTL | joint integrated prioritized target list |
| JMC | joint movement center |
| JOA | joint operations area |
| JOC | joint operations center |
| JOPPA | joint operation planning process for air |
| JP | joint publication |
| JPRC | joint personnel recovery center |

| | |
|------------|--|
| JSOACC | joint special operations air component commander |
| JSOTF | joint special operations task force |
| JTCB | joint targeting coordination board |
| JTF | joint task force |
| LNO | liaison officer |
| LOO | line of operations |
| MAAP | master air attack plan |
| MACCS | Marine air command and control system |
| MAGTF | Marine air-ground task force |
| MARLE | Marine liaison element |
| MOC | maritime operations center |
| MOE | measure of effectiveness |
| MOP | measure of performance |
| NALE | naval and amphibious liaison element |
| NCC | Navy component commander |
| NGO | nongovernmental organization |
| NTACS | Navy tactical air control system |
| NTTP | Navy tactics, techniques, and procedures |
| OCA | offensive counterair |
| OGA | other government agency |
| OPCON | operational control |
| OPLAN | operation plan |
| PED | processing, exploitation, dissemination |
| PNT | positioning, navigation, and timing |
| PR | personnel recovery |
| PRCC | personnel recovery coordination cell |
| RCT | rescue coordination team (Navy) |
| ROE | rules of engagement |
| ROZ | restricted operations zone |
| 618th TACC | 618th Tanker Airlift Control Center |
| SCA | space coordinating authority |
| SD | strategy division |
| SIDO | senior intelligence duty officer |
| SOAGS | special operations air-ground system |
| SOF | special operations forces |
| SOLE | special operations liaison element |
| SPINS | special instructions |

| | |
|------------|---|
| TACC | tactical air command center (Marine Corps); tactical air control center (Navy) |
| TACON | tactical control |
| TACS | theater air control system |
| TAGS | theater air-ground system |
| TBMCS | theater battle management core system |
| TET | targeting effects team |
| TNL | target nomination list |
| TPFDD | time-phased force and deployment data |
| TST | time-sensitive target |
| UA | unmanned aircraft |
| UAS | unmanned aircraft system |
| USTRANSCOM | United States Transportation Command |
| WMD | weapons of mass destruction |

PART II – TERMS AND DEFINITIONS

Unless otherwise annotated, this publication is the proponent for all terms and definitions found in the glossary. Upon approval, JP 1-02, *Department of Defense Dictionary of Military and Associated Terms*, will reflect this publication as the source document for these terms and definitions.

air and space expeditionary task force. A deployed numbered air force or command echelon immediately subordinate to a numbered air force provided as the United States Air Force component command committed to a joint operation. Also called AETF. (This term and its definition modify the existing term and its definition and are approved for inclusion in JP 1-02.)

air and space operations center. The senior agency of the Air Force component commander that provides command and control of Air Force air and space operations and coordinates with other components and Services. Also called AOC. (This term and its definition modify the existing term “Air Force air and space operations center” and its definition and are approved for inclusion in JP 1-02.)

air apportionment. See apportionment (air). (JP 1-02. SOURCE: JP 3-30)

air component coordination element. An Air Force component element that interfaces and provides liaison with the joint force land component commander, or commander Army forces. The air component coordination element is the senior Air Force element assisting the joint force land component commander, or commander Army forces in planning air component supporting and supported requirements. Also called ACCE. (This term and its definition modify the existing term and its definition and are approved for inclusion in JP 1-02.)

air defense. Defensive measures designed to destroy attacking enemy aircraft or missiles in the atmosphere, or to nullify or reduce the effectiveness of such attack. Also called AD. (JP 1-02. SOURCE: JP 3-01)

air domain. The atmosphere, beginning at the Earth’s surface, extending to the altitude where its effects upon operations become negligible. (Approved for inclusion in JP 1-02.)

air employment/allocation plan. None. (Approved for removal from JP 1-02.)

Air Force Component Headquarters. None. (Approved for removal from JP 1-02.)

air interdiction. Air operations conducted to divert, disrupt, delay, or destroy the enemy’s military potential before it can be brought to bear effectively against friendly forces, or to otherwise achieve objectives. Air interdiction is conducted at such distance from friendly forces that detailed integration of each air mission with

the fire and movement of friendly forces is not required. (JP 1-02. SOURCE: JP 3-0)

air offensive. None. (Approved for removal from JP 1-02.)

air reconnaissance. None. (Approved for removal from JP 1-02.)

airspace control area. Airspace that is laterally defined by the boundaries of the operational area, and may be subdivided into airspace control sectors. (JP 1-02. SOURCE: JP 3-01)

airspace control authority. The commander designated to assume overall responsibility for the operation of the airspace control system in the airspace control area. Also called ACA. (JP 1-02. SOURCE: JP 3-52)

airspace control order. An order implementing the airspace control plan that provides the details of the approved requests for airspace coordinating measures. It is published either as part of the air tasking order or as a separate document. Also called ACO. (JP 1-02. SOURCE: JP 3-52)

airspace control plan. The document approved by the joint force commander that provides specific planning guidance and procedures for the airspace control system for the joint force operational area. Also called ACP. (JP 1-02. SOURCE: JP 3-52)

airspace control system. An arrangement of those organizations, personnel, policies, procedures, and facilities required to perform airspace control functions. Also called ACS. (JP 1-02. SOURCE: JP 3-52)

air superiority. That degree of dominance in the air battle of one force over another that permits the conduct of operations by the former and its related land, maritime, and air forces at a given time and place without prohibitive interference by the opposing force. (This term and its definition modify the existing term and its definition and are approved for inclusion in JP 1-02.)

air support operations center. The principal air control agency of the theater air control system responsible for the direction and control of air operations directly supporting the ground combat element. It coordinates air missions requiring integration with other supporting arms and ground forces. It normally collocates with the Army tactical headquarters senior fire support coordination center within the ground combat element. Also called ASOC. (JP 1-02. SOURCE: 3-09.3)

air support request. A means to request preplanned and immediate close air support, air interdiction, air reconnaissance, surveillance, escort, helicopter airlift, and other aircraft missions. Also called AIRSUPREQ. (JP 1-02. SOURCE: JP 3-30)

air supremacy. That degree of air superiority wherein the opposing air force is incapable of effective interference. (JP 1-02. SOURCE: JP 3-30)

air tasking order. A method used to task and disseminate to components, subordinate units, and command and control agencies projected sorties, capabilities and/or forces to targets and specific missions. Normally provides specific instructions to include call signs, targets, controlling agencies, etc., as well as general instructions. Also called ATO. (JP 1-02. SOURCE: JP 3-30)

air tasking order/confirmation. None. (Approved for removal from JP 1-02.)

allocation. In a general sense, distribution for employment of limited forces and resources among competing requirements. Specific allocations (e.g., air sorties, nuclear weapons, forces, and transportation) are described as allocation of air sorties, nuclear weapons, etc. (JP 1-02. SOURCE: JP 5-0)

allocation request. A message used to provide an estimate of the total air effort, to identify any excess and joint force general support aircraft sorties, and to identify unfilled air requirements. This message is used only for preplanned missions and is transmitted on a daily basis, normally 24 hours prior to the start of the next air tasking day. Also called ALLOREQ. (JP 1-02. SOURCE: JP 3-30)

apportionment (air). The determination and assignment of the total expected effort by percentage and/or by priority that should be devoted to the various air operations for a given period of time. Also called air apportionment. (JP 1-02. SOURCE: JP 3-0)

area air defense commander. Within a unified command, subordinate unified command, or joint task force, the commander will assign overall responsibility for air defense to a single commander. Normally, this will be the component commander with the preponderance of air defense capability and the command, control, and communications capability to plan and execute integrated air defense operations. Representation from the other components involved will be provided, as appropriate, to the area air defense commander's headquarters. Also called AADC. (JP 1-02. SOURCE: JP 3-52)

centralized control. 1. In air defense, the control mode whereby a higher echelon makes direct target assignments to fire units. 2. In joint air operations, placing within one commander the responsibility and authority for planning, directing, and coordinating a military operation or group/category of operations. (JP 1-02. SOURCE: JP 3-30)

clean aircraft. None. (Approved for removal from JP 1-02.)

close air support. Air action by fixed- and rotary-wing aircraft against hostile targets that are in close proximity to friendly forces and that require detailed integration of

each air mission with the fire and movement of those forces. Also called CAS. (JP 1-02. SOURCE: JP 3-0)

collateral damage. Unintentional or incidental injury or damage to persons or objects that would not be lawful military targets in the circumstances ruling at the time. Such damage is not unlawful so long as it is not excessive in light of the overall military advantage anticipated from the attack. (JP 1-02. SOURCE: JP 3-60)

combat search and rescue. The tactics, techniques, and procedures performed by forces to effect the recovery of isolated personnel during combat. Also called CSAR. (JP 1-02. SOURCE: JP 3-50)

composite wing. None. (Approved for removal from JP 1-02.)

coordinating altitude. A procedural airspace control method to separate fixed- and rotary-wing aircraft by determining an altitude below which fixed-wing aircraft will normally not fly and above which rotary-wing aircraft normally will not fly. The coordinating altitude is normally specified in the airspace control plan and may include a buffer zone for small altitude deviations. (JP 1-02. SOURCE: JP 3-52)

coordinating authority. A commander or individual assigned responsibility for coordinating specific functions or activities involving forces of two or more Military Departments, two or more joint force components, or two or more forces of the same Service. The commander or individual has the authority to require consultation between the agencies involved, but does not have the authority to compel agreement. In the event that essential agreement cannot be obtained, the matter shall be referred to the appointing authority. Coordinating authority is a consultation relationship, not an authority through which command may be exercised. Coordinating authority is more applicable to planning and similar activities than to operations. (JP 1-02. SOURCE: JP 1)

counterair. A mission that integrates offensive and defensive operations to attain and maintain a desired degree of air superiority. Counterair missions are designed to destroy or negate enemy aircraft and missiles, both before and after launch. (JP 1-02. SOURCE: JP 3-01)

cyberspace. A global domain within the information environment consisting of the interdependent network of information technology infrastructures, including the Internet, telecommunications networks, computer systems, and embedded processors and controllers. (JP 1-02. SOURCE: CJCS CM-0363-08).

decentralized execution. Delegation of execution authority to subordinate commanders. (JP 1-02. SOURCE: JP 3-30)

decision point. A point in space and time when the commander or staff anticipates making a key decision concerning a specific course of action. (JP 1-02. SOURCE: JP 5-0)

decisive point. A geographic place, specific key event, critical factor, or function that, when acted upon, allows commanders to gain a marked advantage over an adversary or contribute materially to achieving success. (JP 1-02. SOURCE: JP 3-0)

director of mobility forces. Normally a senior officer who is familiar with the area of responsibility or joint operations area and possesses an extensive background in air mobility operations. When established, the director of mobility forces serves as the designated agent for all air mobility issues in the area of responsibility or joint operations area, and for other duties as directed. The director of mobility forces exercises coordinating authority between the air operations center (or appropriate theater command and control node), the tanker airlift control center, the air mobility operations control center (when established and when supporting subordinate command objectives), and the joint movement center, in order to expedite the resolution of air mobility issues. The director of mobility forces may be sourced from the theater's organizations or US Transportation Command. Additionally, the director of mobility forces, when designated, will ensure the effective integration of intertheater and intratheater air mobility operations and facilitate the conduct of intratheater air mobility operations. Also called DIRMOBFOR. (JP 1-02. SOURCE: JP 3-17)

dynamic targeting. Targeting that prosecutes targets identified too late, or not selected for action in time to be included in deliberate targeting. (JP 1-02. SOURCE: JP 3-60).

end state. The set of required conditions that defines achievement of the commander's objectives. (JP 1-02. SOURCE: JP 3-0)

flight. 1. In Navy and Marine Corps usage, a specified group of aircraft usually engaged in a common mission. 2. The basic tactical unit in the Air Force, consisting of four or more aircraft in two or more elements. 3. A single aircraft airborne on a nonoperational mission. (JP 1-02. SOURCE: JP 3-30)

intelligence, surveillance, and reconnaissance. An activity that synchronizes and integrates the planning and operation of sensors, assets, and processing, exploitation, and dissemination systems in direct support of current and future operations. This is an integrated intelligence and operations function. Also called ISR. (JP 1-02. SOURCE: JP 2-01)

interdiction. 1. An action to divert, disrupt, delay, or destroy the enemy's military surface capability before it can be used effectively against friendly forces, or to otherwise achieve objectives. 2. In support of law enforcement, activities conducted to divert, disrupt, delay, intercept, board, detain, or destroy, as appropriate, vessels,

vehicles, aircraft, people, and cargo. See also air interdiction. (JP 1-02. SOURCE: JP 3-03)

joint air component coordination element. A general term for the liaison element that serves as the direct representative of the joint force air component commander for joint air operations. Also called JACCE. (Approved for inclusion in JP 1-02.)

joint air operations. Air operations performed with air capabilities/forces made available by components in support of the joint force commander's operation or campaign objectives, or in support of other components of the joint force. (JP 1-02. SOURCE: JP 3-30)

joint air operations center. A jointly staffed facility established for planning, directing, and executing joint air operations in support of the joint force commander's operation or campaign objectives. Also called JAOC. (JP 1-02. SOURCE: JP 3-30)

joint air operations plan. A plan for a connected series of joint air operations to achieve the joint force commander's objectives within a given time and joint operational area. Also called JAOP. (JP 1-02. SOURCE: JP 3-30)

joint force air component commander. The commander within a unified command, subordinate unified command, or joint task force responsible to the establishing commander for making recommendations on the proper employment of assigned, attached, and/or made available for tasking air forces; planning and coordinating air operations; or accomplishing such operational missions as may be assigned. The joint force air component commander is given the authority necessary to accomplish missions and tasks assigned by the establishing commander. Also called JFACC. (JP 1-02. SOURCE: JP 3-0)

joint guidance, apportionment, and targeting team. None. (Approved for removal from JP 1-02.)

joint integrated prioritized target list. A prioritized list of targets approved and maintained by the joint force commander. Targets and priorities are derived from the recommendations of components and other appropriate agencies, in conjunction with their proposed operations supporting the joint force commander's objectives and guidance. Also called JIPTL. (JP 1-02. SOURCE: JP 3-60)

joint special operations air component commander. The commander within a joint force special operations command responsible for planning and executing joint special operations air activities. Also called JSOACC. (JP 1-02. SOURCE: JP 3-05)

joint targeting coordination board. A group formed by the joint force commander to accomplish broad targeting oversight functions that may include but are not limited to coordinating targeting information, providing targeting guidance and priorities,

and refining the joint integrated prioritized target list. The board is normally comprised of representatives from the joint force staff, all components, and if required, component subordinate units. Also called JTCB. (JP 1-02. SOURCE: JP 3-60)

maritime domain. The oceans, seas, bays, estuaries, islands, coastal areas, and the airspace above these, including the littorals. (JP 1-02. SOURCE: JP 3-32)

master air attack plan. A plan that contains key information that forms the foundation of the joint air tasking order. Sometimes referred to as the air employment plan or joint air tasking order shell. Information that may be found in the plan includes joint force commander guidance, joint force air component commander guidance, support plans, component requests, target update requests, availability of capabilities and forces, target information from target lists, aircraft allocation, etc. Also called MAAP. (JP 1-02. SOURCE: JP 3-60)

measure of effectiveness. A criterion used to assess changes in system behavior, capability, or operational environment that is tied to measuring the attainment of an end state, achievement of an objective, or creation of an effect. Also called MOE. (JP 1-02. SOURCE: JP 3-0)

mission. 1. The task, together with the purpose, that clearly indicates the action to be taken and the reason therefore. (JP 3-0) 2. In common usage, especially when applied to lower military units, a duty assigned to an individual or unit; a task. (JP 3-0) 3. The dispatching of one or more aircraft to accomplish one particular task. (JP 3-30). (This term and its definition modify the existing term and its definition and are approved for inclusion in JP 1-02.)

operation plan. 1. Any plan for the conduct of military operations prepared in response to actual and potential contingencies. 2. In the context of joint operation planning level 4 planning detail, a complete and detailed joint plan containing a full description of the concept of operations, all annexes applicable to the plan, and a time-phased force and deployment data. It identifies the specific forces, functional support, and resources required to execute the plan and provide closure estimates for their flow into the theater. Also called OPLAN. (JP 1-02. SOURCE: JP 5-0)

risk management. The process of identifying, assessing, and controlling risks arising from operational factors and making decisions that balance risk cost with mission benefits. Also called RM. (JP 1-02. SOURCE: JP 2-0)

sortie. In air operations, an operational flight by one aircraft. (JP 1-02. SOURCE: JP 3-30)

sortie allotment message. The means by which the joint force commander allots excess sorties to meet requirements of subordinate commanders that are expressed in their

air employment and/or allocation plan. Also called SORTIEALOT. (JP 1-02. SOURCE: JP 3-30)

space coordinating authority. A commander responsible for coordinating joint space operations and integrating space capabilities in the operational area. Also called SCA. (JP 1-02. SOURCE: JP 3-14)

standard use Army aircraft flight route. Routes established below the coordinating altitude to facilitate the movement of Army aviation assets. Routes are normally located in the corps through brigade rear areas of operation and do not require approval by the airspace control authority. Also called SAAFR. (JP 1-02. SOURCE: JP 3-52)

strike coordination and reconnaissance. A mission flown for the purpose of detecting targets and coordinating or performing attack or reconnaissance on those targets. Strike coordination and reconnaissance missions are flown in a specific geographic area and are an element of the command and control interface to coordinate multiple flights, detect and attack targets, neutralize enemy air defenses and provide battle damage assessment. Also called SCAR. (JP 1-02. SOURCE: JP 3-0)

tactical air reconnaissance. None. (Approved for removal from JP 1-02.)

target. 1. An entity or object considered for possible engagement or other action. 2. In intelligence usage, a country, area, installation, agency, or person against which intelligence operations are directed. 3. An area designated and numbered for future firing. 4. In gunfire support usage, an impact burst that hits the target. (JP 1-02. SOURCE: JP 3-60)

target development. The systematic examination of potential target systems - and their components, individual targets, and even elements of targets - to determine the necessary type and duration of the action that must be exerted on each target to create an effect that is consistent with the commander's specific objectives. (JP 1-02. SOURCE: JP 3-60)

targeting. The process of selecting and prioritizing targets and matching the appropriate response to them, considering operational requirements and capabilities. (JP 1-02. SOURCE: JP 3-0)

target nomination list. A target-consolidated list of targets made up of the multiple candidate target lists. A prioritized list of targets drawn from the joint target list and nominated by component commanders, appropriate agencies, or the joint force commander's staff for inclusion on the joint integrated prioritized target list. Also called TNL. (JP 1-02. SOURCE: JP 3-60)

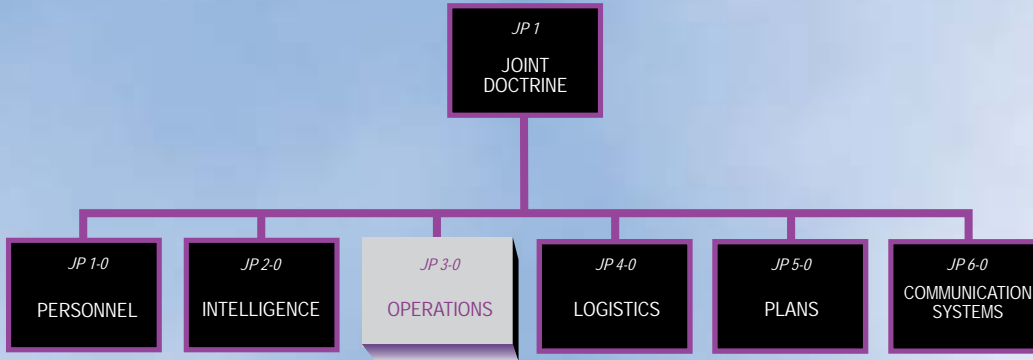
target system. 1. All the targets situated in a particular geographic area and functionally related. 2. A group of targets that are so related that their destruction will produce some particular effect desired by the attacker. (JP 1-02. SOURCE: JP 3-60)

time-sensitive target. A joint force commander designated target requiring immediate response because it is a highly lucrative, fleeting target of opportunity or it poses (or will soon pose) a danger to friendly forces. Also called TST. (JP 1-02. SOURCE: JP 3-60)

weapon system video. None. (Approved for removal from JP 1-02.)

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JOINT DOCTRINE PUBLICATIONS HIERARCHY



All joint publications are organized into a comprehensive hierarchy as shown in the chart above. **Joint Publication (JP) 3-30** is in the **Operations** series of joint doctrine publications. The diagram below illustrates an overview of the development process:

