

## CHAPTER 3

# AIRSPACE MANAGEMENT

Airspace management prevents mutual interference from all users of the airspace, facilitates air defense identification, and accommodates the flow of all air traffic safely. UAV missions are both preplanned and immediate. UAVs frequently operate from tactical field locations which do not allow immediate or constant communications with the airspace agencies in theater. Asset managers, in coordination with their A<sup>2</sup>C<sup>2</sup> element, should consider UAV airspace requirements as soon as possible in the planning process of any UAV mission, and the request sent for approval with equal urgency.

### MILITARY OPERATIONS

Airspace management in theaters conducting military operations increases combat effectiveness by promoting safe, efficient, and flexible use of airspace with a minimum of restraint placed on friendly airspace users. Airspace management includes coordinating, integrating, and regulating airspace to increase effectiveness at all levels of war. Prior to discussing who manages airspace in support of UAV operations, joint airspace control measures should be covered.

#### **Airspace Control Measures:**

Airspace management requires control measures that facilitate the L/R site, flight routes, and task mission area. These control measures consist of a restricted operating zone (ROZ), the UAV blanket, and the coordinating altitude. The most flexible and responsive measure is the UAV blanket.

**Restricted Operating Zone.** A ROZ is a volume of airspace in defined dimensions developed for a specific operational mission or requirement. It restricts some or all airspace users from this area until the end of the mission (see Figure 3-1). A ROZ which is 2 to 3 km in diameter, is usually associated with the L/R site, can be used to protect the mission area, and requires lead-time for approval. UAVs with a limited range, like the M-UAV, Pointer, and EXDRONE, can perform their entire mission from within the ROZ.

Fig 3-1 (4.75)

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**UAV Blanket.** The UAV blanket is a block of airspace which is not restrictive in nature. It is designed to cover as much or as little of a Corps' AO as required. It allows flexibility in mission changes by not restricting the UAV to a specific corridor. The UAV blanket can be used to deconflict the UAV enroute or while operating in the mission area. To reduce potential conflicts with helicopter operations, the UAV blanket altitude should be above the coordinating altitude and expressed in mean sea level (MSL). When high density UAV operations are anticipated, more than one blanket altitude can be established (see Figure 3-2). The UAV blanket altitude is used for longer range UAVs like the UAV-E, JT-UAV, and Pioneer.

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Fig 3-2 (4.50")

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**Coordinating Altitude.** The coordinating altitude is established to separate rotary and fixed-wing aircraft (see Figure 3-3). It does not prohibit either rotary or fixed-wing aircraft the use of airspace above or below it. Aircraft that need to pass through the coordinating altitude for operational requirements must check with the appropriate Army or Air Force controlling agency before penetrating the coordinating altitude. When an aircraft passes into the airspace above or below this coordinating altitude, control always reverts to the controlling authority for that airspace. Approved entry/exit corridors can be used to gain access to restricted flight areas and achieve correct mission altitude enroute to a target area.

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fig 3-3 (5.)

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**Airspace C<sup>2</sup> Organizations:**

The Air Force C<sup>2</sup> structure is designed to integrate with Army C<sup>2</sup> to provide timely support to operations. Within this structure, personnel, organizations, and facilities, are required to maintain airspace management.

For joint operations, the Air Force Component Commander (AFCC) is normally designated the Joint Forces Air Component Commander (JFACC), the Area Air Defense Commander (AADC), and the airspace command authority (ACA). He executes his responsibilities in accordance with the objectives of the Joint Forces Land Component Commander (JFLCC). As the ACA, he fulfills his responsibilities through the integrated airspace control system. This system is structured around the theater air control system (TACS) and the A<sup>2</sup>C<sup>2</sup> system.

The A<sup>2</sup>C<sup>2</sup> organization (see Figure 3-4) is composed of staff elements at each command echelon from maneuver battalion through the theater Army. It includes air defense artillery (ADA) elements, fire support coordination (FSCoord) elements, Army air traffic services (ATS) facilities, and airspace control liaison personnel. The A<sup>2</sup>C<sup>2</sup> element is located within the command post (CP) established at each tactical echelon. Only theater, corps, and division have dedicated A<sup>2</sup>C<sup>2</sup> elements to accomplish A<sup>2</sup>C<sup>2</sup> tasks. Brigades and battalions must establish an A<sup>2</sup>C<sup>2</sup> element with their organic personnel and the tactical air control party (TACP).

**A<sup>2</sup>C<sup>2</sup> Land Component Commander and Battlefield Coordination Element (BCE).** A<sup>2</sup>C<sup>2</sup> elements at this level provide the interface required for joint operations.

**A<sup>2</sup>C<sup>2</sup> at Theater Army.** The theater Army A<sup>2</sup>C<sup>2</sup> organization supports operational planning, conducts current operations, and performs specified functions for the theater Army CP. The A<sup>2</sup>C<sup>2</sup> element is the focal point for all airspace control activities related to theater Army rear and deep operations as well as the planning for future operations. The A<sup>2</sup>C<sup>2</sup> element works for the G3, but is normally supervised by the G3 Air.

**A<sup>2</sup>C<sup>2</sup> at Corps.** The corps A<sup>2</sup>C<sup>2</sup> organization supports future operational planning, conducts current operations, and performs specified functions for each CP.

- The A<sup>2</sup>C<sup>2</sup> at the Corps Main CP collocates with the fire support element (FSE). It is the focal point for all airspace control activities related to corps rear area operations, deep operations, and planning future operations. The A<sup>2</sup>C<sup>2</sup> element works for the G3, but is normally supervised by the G3 Air. The main CP A<sup>2</sup>C<sup>2</sup> element consists of, but is not limited to, the ADA element; aviation element; air liaison officer (ALO); FSE; the ATS unit assigned to the corps; corps' ACE, as required; the G4 section, as required; and the air and naval gunfire liaison company (ANGLICO). Personnel from these elements and sections perform two separate tasks. First, they perform their primary staff functions. Second, they assist in synchronizing airspace requirements of their parent units with airspace users of the combined arms team and supporting services.
- The A<sup>2</sup>C<sup>2</sup> at the Corps Tactical CP performs airspace management activities and supports close operations with the A<sup>2</sup>C<sup>2</sup> element at the main CP. The A<sup>2</sup>C<sup>2</sup> elements at both tactical and main CP maintain close coordination to ensure that airspace requirements generated by changes to the tactical situation are met in a timely and effective manner. The corps A<sup>2</sup>C<sup>2</sup> element representatives at the tactical CP consist of a fire support officer (FSO), an aviation officer or noncommissioned officer (NCO), an ADA officer or NCO, and an ALO. The FSO or aviation officer will serve as the element chief.
- The A<sup>2</sup>C<sup>2</sup> at the Corps Rear CP is handled at the main CP by the A<sup>2</sup>C<sup>2</sup> element.

fig 3-4 (full)

**A<sup>2</sup>C<sup>2</sup> at Division.** The division A<sup>2</sup>C<sup>2</sup> organization within the tactical and main CPs are similar to those at corps. The division's primary focus is on the conduct of battles and engagements in the forward portion of the combat zone (division rear boundary and forward). Therefore, airspace control tasks are required to synchronize all airspace users of the combined arms team and supporting services with the close battle. The difference in geographical orientation (forward vs. rear) results in minor differences in the airspace control procedures employed and the degree of coordination required.

- The A<sup>2</sup>C<sup>2</sup> at the Division Main CP includes the G3 Air; ADA element; aviation element; ATS liaison element, as required; FSE; division G2 section; G4 section, as required; ALO; and ANGLICO.
- The A<sup>2</sup>C<sup>2</sup> at the Division Tactical CP includes a G3 officer, as chief, assisted by a FSO; a G2 representative; an aviation representative; an ADA representative; and a fighter liaison officer (FLO).

**A<sup>2</sup>C<sup>2</sup> at Brigade and Battalion.** The A<sup>2</sup>C<sup>2</sup> function is performed by existing staff personnel, supporting liaison representatives, and fire support representatives. The A<sup>2</sup>C<sup>2</sup> staff elements include the S2, S3 Air, FSO, and an ADA liaison officer (LO). There may or may not be an aviation LO and UAV LO present.

**Air Traffic Services.** The ATS focuses on the Army's participation to synchronize airspace use and coordinate with joint agencies, when required. Within each corps, an ATS battalion consists of flight operation centers (FOCs), representatives at each A<sup>2</sup>C<sup>2</sup> element, and teams maintaining navigational aids (NAVAIDS) and providing terminal control at Army airfields.

#### **A<sup>2</sup>C<sup>2</sup> Responsibilities:**

All A<sup>2</sup>C<sup>2</sup> elements form a vertical and horizontal channel through which airspace control requirements coordinate, synchronize, and disseminate with operation plans (OPLANs) and operation orders (OPORDs) (see Figure 3-5). Primary tasks of the A<sup>2</sup>C<sup>2</sup> elements include—

- Developing and coordinating airspace control standing operating procedures (SOPs), OPLANs, and annexes.
- Coordinating and integrating airspace user requirements within the AO.
- Coordinating and integrating airspace use within the AO, with other services, and adjacent units.
- Identifying and resolving airspace user conflicts.
- Approving, staffing, and forwarding to the next higher headquarters (HQ) requests for special airspace use.
- Maintaining A<sup>2</sup>C<sup>2</sup> information displays and maps.

Figure 3-5. Full



**A<sup>2</sup>C<sup>2</sup> Procedures:**

Success on the battlefield depends on how effective airspace over that battlefield is used. A high density of friendly weapon systems with overlapping flight profiles and operating envelopes contribute to maximum combat effectiveness without user conflicts. Airspace management maximizes force effectiveness without inhibiting either the ground effort or the airspace users supporting it. These procedures define the methods used to accomplish the airspace control function, ensure unity, and standardize the airspace control effort. They must be sufficiently flexible and responsive to accommodate the rapid changes to planned and ongoing operations.

**Airspace Request and Tasking Channels:**

Subject to the authority and approval of the JFC, the ACA develops procedures for airspace control and coordination within the assigned airspace control area. Using the facilities previously described, the ACA develops the airspace control plan (ACP) and, once approved by the JFC, publishes it to all users. The ACP is implemented through a cyclic ACO. The ACO provides details of the approved requests for airspace control measures and is published either as part of the air tasking order (ATO) or as a separate document. Based on policy in the ACP, Army commanders submit their requests for airspace control measures through the operational chain (as shown in Figure 3-5).

The BCE integrates the Army's airspace requirements into the ACO and keeps the ACA informed on Army related airspace activities. When the ACO becomes effective, the control and reporting center (CRC) becomes the primary facility responsible for its execution. Deconfliction at this point is normally handled by the CRC with assistance from the Army A<sup>2</sup>C<sup>2</sup> element.

**A<sup>2</sup>C<sup>2</sup> Implementation:**

Establishing most airspace control measures requires the approval of the ACA. Army commanders inform the ACA of their requirements through the operational chain. The use of a United States Message Text Format (USMTF) facilitates and standardizes the process of requesting the establishment of airspace control measures. Airspace request formats outline the necessary information to include location, lateral and vertical limits, and timeframe during which the measure is enforced.

The actual UAV airspace deconfliction and coordination begins with the echelon asset manager. He identifies the operating area to be covered by the UAV and passes this information to the A<sup>2</sup>C<sup>2</sup> element. With the mission area and L/R site identified, the A<sup>2</sup>C<sup>2</sup> element requests the appropriate control measures. The UAV commander will be involved with this process to ensure mission specific needs are met. Once control measures have been approved, the mission is tasked. If a mission has been tasked and a UAV blanket has not been established, airspace requirements can still be met. It will require intense coordination between the A<sup>2</sup>C<sup>2</sup> element and appropriate airspace control agencies such as the air support operations center (ASOC), the air operations center (AOC), and the direct air support center (DASC).

The A<sup>2</sup>C<sup>2</sup> element supports the UAV operation, accomplishes deconfliction procedures, and forwards and updates UAV status to the CRC and AOC. All aircraft working within the sector checks with the AOC on entry and are advised of the status of UAV protocols. The AOC and CRC are responsible for relaying this information to the Airborne Battlefield Command and Control

Center (ABCCC), and the Airborne Warning and Control System (AWACS), notifying them of the "Hot and Cold" status of UAV operating areas. The following planning considerations are helpful in designing A<sup>2</sup>C<sup>2</sup> measures:

- Maximize control through use of airspace control measures. These measures reserve the airspace and control the actions of specific airspace users.
- Exercise positive control through means such as identification, friend or foe (IFF), and identify and locate airspace users. In addition, continuous communications must be maintained with airspace users.
- Ensure the scheme of maneuver and commander's intent determine and govern the design of the control measures.
- Establish controls that provide maximum freedom consistent with the degree of risk acceptable to the commander, and that airspace users and ground based weapons crews can recognize.
- Ensure temporary airspace control measures are within the AO and that of the requesting echelon.

## THE NATIONAL AIRSPACE SYSTEM

The Federal Aviation Administration (FAA) has established efficient airspace and air traffic control measures. These measures permit the movement of people and air commerce at optimum levels of safety and efficiency and meet the national security needs of the country.

Army airspace management in the National Airspace System (NAS) is prescribed by Army Regulation (AR) 95-2. The regulation is more restrictive than the FAA, and limits UAV operations as follows—

- UAV operations will be rigidly controlled to avoid hazards to other air traffic. The following restrictions apply to UAV operations:
  - Flights will be conducted within restricted airspace approved for UAV operations.
  - Flights may be conducted within Class A airspace, provided it has been properly coordinated with the FAA.

- Flights may be conducted within warning areas, provided it has been properly coordinated with the Department of the Navy and the FAA.
- Outside of the above areas (with the exception of UAVs that may be classified as model aircraft), the UAV must be accompanied by a chase plane with direct communications to the UAV controlling facility. It is the chase plane operator's responsibility to relay potential conflicts to the UAV controlling facility and provide changes of heading and altitude to resolve any traffic conflicts. If an alternate means of observing UAV flight and communications with the UAV controlling facility is available, which would provide a level of safety equal to that provided by the chase plane, it may be approved at the discretion of the concerned FAA region. Operations shall be conducted in visual flight rule (VFR) conditions. Examples include visual observation from one or more ground sites; and positive primary radar observation.
- The following operational guidelines apply to UAVs that are classified as model aircraft (such as a hand-launched UAV [HL-UAV]):
  - The operating site should not be located near populated areas or noise sensitive areas such as parks, schools, hospitals, and churches.
  - Avoid operations in the presence of spectators until the UAV has been successfully flight tested and proven airworthy.
  - Do not fly UAVs more than 400 feet above ground level (AGL).
  - Operations conducted within 3 miles of an airport or heliport require notifying the airport or heliport operator.
  - Give the right of way to, and avoid flying in the proximity of, manned aircraft.
  - Use observers to assist in avoiding nonparticipating aircraft.
  - Each UAV and associated radio control equipment will be checked for normal operation prior to launch.
  - Live fire exercises involving UAVs will be conducted within controlled firing areas or restricted areas.

**Special Use Airspace Acquisition:**

Installation commanders, responsible for activities impacting the NAS, will comply with AR 95-2 by designating an installation air traffic and airspace (AT&A) officer to represent him on matters pertaining to the NAS. The regulation defines policy, assigns responsibility, and specifies the actions required for special use airspace acquisition (including a suggested format). The regulation also establishes the requirement for an annual review concerning the adequacy of special use airspace.

UAV commanders are responsible for acquiring special use airspace adequate for their units to train. If no restricted area exists where the UAV operation is planned, a proposal to establish a restricted area must be developed, coordinated, and submitted through the AT&A officer to the FAA for rulemaking action. The minimum time required for establishment is six months after the proposal has been received by the FAA. If existing restricted areas are available, but not designated for UAV operations, the AT&A officer has the responsibility to initiate a change.

Airspace requests should include L/R locations, minimum and maximum altitudes, area to be used, and any special requirements. Requests to operate UAVs outside restricted airspace should be submitted to the G3 and S3 Air not later than 14 days prior to the proposed training mission. Requests include, but are not limited to—

- Date of mission.
- Time AV is scheduled to depart and re-enter restricted airspace.
- Proposed flight path and altitudes.
- Emergency landing site.
- Chase plane requirements.

The G3 and S3 Air will coordinate with the local AT&A officer or area FAA air traffic control (ATC) center, as appropriate, for restricted airspace operations and for operations outside restricted airspace. Stereo flight plans (plans for which all parameters are established and remain the same) may be put on file with the G3 Air to reduce filing time requirements.

## APPLICATIONS OF A <sup>2</sup>C<sup>2</sup> IN OPERATIONS OTHER THAN WAR

There is a strong possibility that OOTW will occur on foreign soil. When the focus is on supporting the host nation (HN), the ATC of the HN will provide the framework around which most of the airspace control functions take place. If the HN has no tactical air control system, then the ATC of the HN provides the framework for establishing airspace control measures. Bilateral and international agreements often establish regulatory guidance affecting the use of airspace and the conduct of ATC activities. Any required changes or waivers to HN regulations, as well as problems which result from restrictions to military operations, will be forwarded to the commander, and may be referred to diplomatic channels for resolution.