Ministry of Defence

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Allied Joint Publication-3.3.5

# Allied Joint Doctrine for Airspace Control

Edition C Version 1

# NATO STANDARD

# AJP-3.3.5

# ALLIED JOINT DOCTRINE FOR AIRSPACE CONTROL

**Edition C, Version 1**

**MARCH 2024**

**NORTH ATLANTIC TREATY ORGANIZATION**

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**NATO LETTER OF PROMULGATION**

5 March 2024

1. The enclosed Allied Joint Publication AJP-3.3.5, Edition C, Version 1, ALLIED JOINT DOCTRINE FOR AIRSPACE CONTROL, which has been approved by the nations in the Military Committee Joint Standardization Board, is promulgated herewith. The agreement of nations to use this publication is recorded in STANAG 3805.

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Lieutenant General, GRC (A)
Director, NATO Standardization Office

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# Allied Joint Publication-3.3.5

# Allied Joint Doctrine for Airspace Control

Allied Joint Publication-3.3.5 (AJP-3.3.5), Edition C, Version 1,
dated March 2024,
is promulgated as directed by the Chiefs of Staff

Director Development, Concepts and Doctrine Centre

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# RECORD OF NATIONAL RESERVATIONS

| CHAPTER | RECORD OF RESERVATION BY NATIONS |
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| Note: | The reservations listed on this page include only those that were recorded at time of promulgation and may not be complete. Refer to the NATO Standardization Documents Database for the complete list of existing reservations. |

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# RECORD OF SPECIFIC RESERVATIONS

| [nation] | [detail of reservation] |
|---|---|
| DNK | Mode 5 capability is not yet fully implemented on all Air Force and Navy platforms and radar systems. Mode 5 capability will be available when modifications, updates and new systems are implemented. |
| FRA | The document refers to space operations, in particular launches, but does not mention space launch pads. This point should be included in the next edition.<br>Section 3 - Unmanned Aircraft / paragraph 4.13: there is a potential risk for all helicopter formations when it is envisaged that UAVs will use the Slow aviation assets flight route (SAAFR). It will be necessary to plan and coordinate flight operations at the right level (deconfliction and safety): each SAAFR user must be aware that he is not alone in its maneuvering area. |
| NLD | Accreditation of SMART-L radar in relation with MODE 5 and full implementation of MODE 5 is ongoing. Date of accreditation is unknown. |
| POL | STANAG will be implemented after the amendment of the regulation of the Council of Ministers dated 31 October 2007 on the transfer to the Minister of National Defence of functions resulting from sovereignty over Polish airspace for the timer od war, martial law or stare od emergency.<br>Along with the implementation, the doctrinal document DD-3.3.5(B) Szkol. 878/2014 introduced by the order no. 24/SG/CDiS od the Chief of Generał Staff of the PAF dated 14 January 2014 will be withdrawn. |
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# Summary of changes

| Record of summary of changes for Allied Joint Publication (AJP)-3.3.5 |
|---|
| • Describes and explains operational guidance for mitigating the risk of interference and coordination between military and civilian airspace users. |
| • Introduces and describes airspace control elements.<br>  o Identifies roles and responsibilities.<br>  o Knowledge, training, and exercise requirements. |
| • Includes CMs and US ACM binning scheme found in JP 3-52, "*Airspace control*". |
| • Updates text, terminology, definitions, references, and brevity terms to ensure consistency with current policy, Allied joint doctrine and NATOTerm. |
| • Adds Mode 5 as Theatre Entry Standard and rewritten section regarding Identification for clarity and accuracy. |
| • Provides clarity to procedural and positive control airspace control methods. |
| • Introduces space operations as potential airspace users for integration and deconfliction purposes when applicable. |
| • Replaces to air defence (AD) with air and missile defence (AMD) regarding forces and AMD operations. |
| • Adds AWACS as an ID authority. |
| • Replaces reference to unmanned aircraft systems (UAS) to unmanned aircraft (UA). |

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# Related Documents

A. AC/92-D(2013)0009, *Guidelines for ATM Coordination in Crisis Situation*
B. AJP-01, *Allied Joint Doctrine*
C. AJP-3, *Allied Joint Doctrine for the Conduct of Operations*
D. AJP-3.20, *Allied Joint Doctrine for Cyberspace Operations*
E. AJP-3.3, *Allied Joint Doctrine for Air and Space Operations*
F. AJP-3.3.3*, Allied Joint Doctrine for Air Maritime Coordination*
G. AJP-3.6, *Allied Joint Doctrine for Electronic Warfare*
H. AJP-3.19, *Allied Joint Doctrine for Civil-Military Cooperation*
I. ATP-3.3.3.1, *Air-Maritime Coordination Procedures*
J. ATP-3.3.5.1, *Joint Airspace Control Tactics, Techniques and Procedures*
K. ATP-3.3.8.2, *Unmanned Aircraft System Tactics, Techniques and Procedures*
L. ATP-01, *Allied Maritime Tactical Instructions and Procedure*s
M. ATP-08, *Doctrine for Amphibious Operations*
N. APP-01, *Allied and Multinational Maritime Voice Reporting Procedures*
O. APP-07, *Joint Brevity Words*
P. APP-11, *NATO Message Catalogue*
Q. ADatP-03, *Concept of NATO Message Text Formatting System*
R. AArtyP-05, *NATO Fire Support Doctrine*
S. NATO Terminology website: https://nso.nato.int/natoterm/

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# Preface

## Scope

Allied Joint Publication (AJP)-3.3.5 *Allied Joint Doctrine for Airspace Control* provides doctrine to plan, execute and assess airspace control during NATO or NATO-led operations. This publication is a part of the air operations doctrine architecture.

## Purpose

The purpose of AJP-3.3.5 is to provide the necessary guidance to conduct airspace control and enable air, land, maritime, cyberspace, space and special operations forces to operate in an efficient, integrated, and flexible manner, without undue restraint or risk to friendly forces and civilian users, and to prevent friendly fire. This airspace control doctrine provides commanders with the operational flexibility to effectively employ forces according to mission priorities. It is not intended to restrict the authority and responsibility of commanders and their organic resources, but rather to enhance overall operations. AJP-3.3.5 is closely linked to AJP-3, *Allied Joint Doctrine for the Conduct of Operations*, specifically regarding engagement management.

## Application

AJP-3.3.5 provides deliberately broad operational guidance for NATO operational commanders and their staffs. However, the doctrine is instructive too, and provides a useful framework for operations conducted by a coalition of NATO nations, partners, non-NATO nations and other organizations participating, and non-NATO led operations. AJP-3.3.5 is primarily intended for NATO forces; the doctrine is also applicable to operations within the framework of a combined joint task force or multinational force (MNF) of NATO and non-NATO nation units. Therefore, references to the commander joint force command throughout this publication would apply equally to the commander joint task force or commander MNF in those situations.

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# Chapter 1 – Introduction

## Section 1 – Description

1.1 The strategic context within which the Alliance operates continues to evolve. NATO's military capabilities, strategy and plans continuously adapt to meet the challenge of enduring strategic competition. Virtually all military operations across the continuum of competition rely on the use of aircraft. Both manned and unmanned aircraft are used extensively in joint operations and have associated operational/tactical engagement space requirements which consequently necessitate coordination at a joint level.

1.2 Due to cost and complexity, most manned aircraft and larger unmanned aircraft are scarce assets. To enhance their survivability and efficiency, potential threats need to be detected, identified, and if mission dictates negated. Aircraft are at risk from enemy air defence weapons, indirect surface-to-surface fires (e.g., rockets, missiles, artillery), and potentially from friendly air and missile defence (AMD) weapons. Additionally, poor planning, coordination or execution can create hazards even in permissive environments.

1.3 The risk of friendly fire or damage/destruction of third parties, such as civilian air traffic, is a constant challenge. Visual identification (ID) of aircraft is both difficult and risky, and operators of visually aimed AMD weapons normally have only a short time to decide whether to engage. Electromagnetic means of interrogation are the primary means of ID and are designed to distinguish aircraft ID. However, interrogator data cannot be relied upon as the only source to determine ID, and all available means should be made to correlate with at least one more source. Employing interoperable electromagnetic datalinks can significantly reduce the risk of engagement by friendly forces.

1.4 The risk of friendly forces losses can be reduced by placing constraints on friendly airspace use and on AMD[1] assets. However, such action could inhibit operational flexibility, reduce mission effectiveness, and allow enemy aircraft or missiles to penetrate defences without being engaged. Accurate ID of aircraft and missiles, robust rules and procedures for airspace routing and constraints to AMD forces can reduce the potential for undesired engagements or friendly fire.

1.5 Military and civil flight operations may occur in the same area. Therefore, it is necessary for military authorities to ensure deconfliction of military and civil air operations. It is essential that all military and civilian airspace users[2] are aware of the hazards and threats, along with the measures taken to minimize those threats to aircraft, while at the same time maximizing freedom of action.

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[1] For AMD details, see AJP-3.3.1, *Allied Joint Doctrine for Counter-Air.*

[2] Airspace users refers to military and civilian aircraft; the airspace control elements and air traffic control agencies; component airspace planners; surface fires conducted in and through the airspace; and the agencies controlling those surface fires.

1.6 Airspace control is the implementation and coordination of the procedures governing airspace planning and organization in order to minimize risk and allow for the efficient and flexible use of airspace. The designated airspace control authority (ACA) exercises tactical control (TACON) through airspace control system using airspace control means to regulate the assigned airspace and users. The ACA typically exercises mission command and delegates TACON for decentralized execution to airspace control elements. This allows airspace control elements to dynamically coordinate airspace with airspace users. Airspace control elements include air operations centres (AOC), control and reporting centres (CRC), airborne warning and control system (AWACS), air traffic control, civilian air traffic system, air support operations centre (ASOC). Airspace control reduces the risk of unintended engagements against friendly, civil, and neutral aircraft; enhances AMD operations; and permits greater flexibility of joint operations. Airspace control provides a commander with the operational flexibility to effectively employ forces according to mission priorities.

## Section 2 – Principles of airspace control

1.7 The airspace control system is an arrangement of those organizations, personnel, policies, procedures, and facilities required to perform airspace control. Airspace control effectiveness should be developed with the following considerations:

a. **Unity of effort.** Unity of effort emphasizes all available means are directed to a common goal. This is achieved principally through unity of command, and both are essential in military operations. Commanders may view the operation through their own lenses, but all contribute to achieving the commander joint force command (COM JFC's) objectives. To address airspace objectives within the context of a theatre airspace structure, an ACA is normally designated by the COM JFC. The ACA is the commander designated to assume overall responsibility for the operation of the airspace control system.

b. **Close liaison and coordination.** The COM JFC designated ACA coordinates with all airspace users, both military and civilian, to integrate and coordinate airspace requirements. Close liaison and coordination among all airspace users inside and outside the operational area are necessary to promote timely and accurate information flow to airspace control elements. Effective liaison and coordination directly relate to the success of the operation. Coordination and cooperation with civilian users and authorities is key to avoid negative impacts on military operations, non-military, and civilian operations.[3] Military limitations (constraints and restraints) and the sheer demand for airspace require coordination and may result in overlapping airspace structures. If airspace structures overlap, responsibilities, usage, and priorities should be unambiguously coordinated and defined. Close coordination between airspace control elements and AMD elements is crucial to reduce the risk of friendly fire and

[3] For additional information, see AJP-3.19, *Allied Joint Doctrine for Civil-Military Cooperation*.

balance those risks with the requirements for effective AMD. Air traffic services (ATS),[4] airspace control, and AMD procedures, equipment, and terminology should be mutually supporting and interoperable to the greatest extent possible. The degree of interoperability varies based upon the airspace control area and cooperation of civilian authorities.

c. **Common procedures**. Common airspace control procedures enhance the effectiveness of joint operations by allowing maximum flexibility through an effective mix of ID and control measures. The airspace control system permits close coordination between air, land, maritime, space and special operations forces, allowing for the rapid concentration of combat power in a specific portion of airspace when directed.

d. **Simplicity.** Airspace control procedures need to be as simple as possible to execute for all personnel involved. Airspace control can use a variety of measures, including visual and electromagnetic means, or specific discriminators associated with time and segmentation of airspace and manoeuvre.

e. **Reliable and interoperable command and control systems.** The airspace control system should be based on a reliable and secure command and control (C2) network which is resilient to electromagnetic and cyberspace attack. All C2 systems connected within the airspace control system (ACS) should be interoperable to the highest degree possible. Since complete interoperability is unlikely to be achieved, coordinated, and detailed planning is required among all airspace users.

f. **Robust and resilient.** The ACS should be survivable, sustainable, and have built-in resiliency, to withstand all forms of attacks. The airspace control system should be responsive to evolving threat conditions and capable of supporting operations through day and night, and under adverse environmental conditions.

g. **Inclusion of all airspace users.** All airspace users should participate in the planning of airspace control and adhere to the approved procedures and measures. Depending on the scenario, this includes military aircraft planners, airspace control system agencies, AMD forces, indirect fires, space launch and recovery operations and civil aviation and ATS in neighbouring nations or other affected areas.

h. **Flexibility.** Airspace control procedures should provide maximum flexibility through an effective mix of positive and procedural control measures. The airspace control should encourage close coordination between joint force components to enable rapid concentration of combat power.

[4] For this publication, ATS is a general reference to the services provided to military and civilian aircraft including but not limited to tower services, radar approach and en route control, and flight information services performed by military/civil air traffic control and airfield management agencies and facilities.

i. **Security.** Security, specifically operations security, enhances freedom of action by limiting vulnerability to hostile activities and threats. Active and passive security measures help to deny critical information to an adversary. They assist deception and help counter offensive actions and bolster defensive actions.

1.8 **Training.** ACS element personnel operate in a complex environment. These personnel require appropriate education and continuous training for effective and safe airspace operations like civilian air traffic controllers. ACS element personnel and components should be trained, organized, and equipped to provide varied airspace control capabilities as the mission dictates. ACS personnel require continued airspace education, training, and exercises to be proficient. Training and exercises should be based on individual, national and mission specific tasks. ACS personnel and control elements should be exercised as an overall system rather than as separate entities for realistic training. Exercises and simulations involving military and civilian airspace users provide complexity and needed realism to effectively train ACS components. Training the ACS in its entirety is challenging when it involves civilian airspace users. Airspace control elements should establish procedural agreements and required communication links to ensure effective coordination.

## Section 3 – Information management, electromagnetic warfare, and cyberspace operations

1.9 Integral to airspace control is the ability to manage, process and protect information via associated communications and information systems. Identifying, requesting, receiving, tracking, and disseminating trusted information assists decision makers in making informed, timely decisions. Effective use of information systems requires knowledgeable users, criteria for usable information, as well as protection for both the systems and the information.

1.10 Electromagnetic information and its supporting systems, electromagnetic defence, cyberspace security, and defensive cyberspace operations are essential to airspace control. Airspace control systems are built on a foundation of electromagnetic information communications and inherit the electromagnetic and cybersecurity vulnerabilities from supporting/component systems. Airspace control systems are susceptible to electromagnetic and cyberspace attack and interference from adversary and friendly transmissions. Such attacks and interference can result in decreased situational awareness, degraded communications between airspace control elements and airspace users, increased threat from enemy air attacks, and friendly fire. Degradation and outage procedures should be established and exercised, and integrated with cyberspace operations, electromagnetic warfare, and spectrum management.[5]

[5] For details on cyberspace operations, computer information systems, electromagnetic warfare and spectrum management and, see AJP-3.20, *Allied Joint Doctrine for Cyberspace Operations* and AJP-3.6, *Allied Joint Doctrine for Electronic Warfare*.

# Chapter 2 – Roles and responsibilities

## Section 1 – General

2.1 Friendly forces should operate with a level of risk as directed by the commander joint force command (COM JFC). All military and civil air traffic needs to be deconflicted from joint force fires. Specifically, air and missile defence (AMD) assets must be able to distinguish between friendly, neutral, hostile, and unknown aircraft to effectively engage hostiles, and safeguard friendly and neutral traffic. To achieve these aims the airspace control authority (ACA) should ensure an appropriate control system exists. Nations remain responsible for operating their own air traffic services (ATS) and aeronautical communications systems, except where alternative arrangements might be established.[6]

2.2 Understanding the roles of the airspace control authority (ACA), the air and missile defence commander (AMDC), the COM JFAC and other component commanders in executing the COM JFC's campaign or operation plan (OPLAN) is essential. Normally vesting appropriate authority and responsibility for ACA, AMDC, and COM JFAC in a single individual provides for the effective leadership and decision authority over assigned forces to achieve a common objective.

## Section 2 – Joint force commander

2.3 The COM JFC exercises command and control (C2) as delegated overall force components within the joint operations area (JOA). The COM JFC exercises coordinating authority for those forces remaining under national control operating in or transiting the JOA, and for military aspects of airspace control. This includes positioning and reporting, rules of engagement, and force protection.

## Section 3 – Airspace control authority

2.4 At the direction of the COM JFC, and normally detailed in the OPLAN, the ACA assumes overall responsibility for the airspace control system in the JOA. The broad responsibilities of the ACA include coordinating and integrating the use of the JOA. Subject to the approval of the COM JFC, the ACA develops broad policies and procedures for military airspace users and airspace control elements within the JOA. These policies and procedures are published in the airspace control plan (ACP). The ACA establishes an airspace control system that deconflicts military and civil airspace control issues and requirements and provides for airspace integration with the host nation and other affected nations. The ACA develops the ACP and, after obtaining COM JFC approval, promulgates it. Implementation of the ACP takes place through the airspace control order (ACO) and airspace control elements. A key

[6] For more information, see SACEUR's Standing Defence Plan (SDP) 11000 regarding Integrated Air and Missile Defence (IAMD).

responsibility of the ACA is to provide the flexibility needed within the airspace control system (ACS) to meet contingency situations that necessitate rapid employment of forces as well as dynamic changes to component operations. The ACA does not have the authority to approve, disapprove, or deny component operations. That authority is only vested in operational commanders. If the ACA and an affected component commander are unable to agree on an airspace issue, the issue will be referred to the COM JFC for resolution. The ACA supports the AMDC's establishment and maintenance of the recognized air picture (RAP) through the provision of airspace control sensor information as required. The following describes various airspace control responsibilities and authorities:

a. **Joint airspace coordination centre.** The joint airspace coordination centre (JACC) is the ACA's primary airspace control facility for coordinating the use of airspace within the JOA. When the COM JFAC is also the ACA, the JACC is usually located in the combat plans division of the joint force air component headquarters. The JACC:

(1) Coordinates requests for coordination measures (CMs) which are used to segregate, control, and/or reserve airspace for air operations, and support identification (ID) methods, thereby reducing the risk of friendly fire. CMs are categorized as airspace control means (ACMs), fire support coordination measures (FSCMs), manoeuvre control measures, air reference measures, air defence measures (ADMs), maritime defence measures, and air traffic control measures (ATCMs). CMs facilitate the efficient use of airspace for offensive and defensive operations, support surface forces manoeuvre and provide air traffic control while simultaneously providing safeguards for friendly forces.

(2) Resolves conflicting requests for CMs, referring those that cannot be resolved through the ACA to the COM JFC for a final decision.

(3) Promulgates activation, deactivation, modification of CMs by ACO dissemination. The ACA may delegate to an air operations centre (AOC) or airspace control elements the authority to coordinate airspace changes dynamically with affected airspace users before a change to the ACO is formally promulgated.

(4) Coordinates with NATO and national military commanders, component commanders, adjacent airspace control authorities, and affected national, international civil and military agencies, when necessary.

b. **Sub-area airspace control authority.** The JOA may be sub-divided into airspace control sub-areas based on command structures and capabilities, operational factors, various missions, geographic factors, the complexities of airspace control, AMD requirements, and International Civil Aviation Organization standards. As such, an ACA may designate a sub-area airspace control authority (SACA). A SACA may be also designated to support maritime and other operations involving one or more aircraft

carriers. The designation of a SACA should be limited to very special cases to ensure unity of effort and maximise close coordination. Activities a SACA conducts are:

(1) Plans, coordinates (to include coordination of any adjacent sub-areas), recommends airspace control means for the assigned sub-area portion of the ACP.

(2) Implements ACO/ACP promulgated by the JACC.

(3) Conducts liaison with the ACA for airspace control and the AMDC for AMD matters.

c. **Responsibilities of commanders not appointed sub-area airspace control authority.** Commanders that use the airspace within the JOA:

(1) Support airspace control in designated airspace in accordance with policies promulgated by the ACA/SACA(s).

(2) Provide C2 and ATS representatives and liaison to the ACA and SACA(s), as required.

(3) When instructed by the ACA/SACA(s), assist in developing detailed airspace control instructions and plans in accordance with policies and procedures detailed in the ACP.

(4) Ensure compliance with the ACP, the ACO and additional activated CMs that are not part of the latest ACO.

(5) Coordinate requirements for use of airspace with the ACA/SACA(s) through the JACC by establishing and maintaining an interface with the ACA/SACA(s) for planning and coordination of airspace activities.

d. **Coordination with adjacent authorities.** When subdividing the ACA and delegating responsibilities, the ACA should consider flight safety and security requirements of all nations affected, including nations outside the JOA. Coordination with airspace control elements of adjacent area operational commanders should be conducted during airspace control planning. It is essential to obtain mutual agreements regarding airspace control between respective operational commanders, subordinate commanders, designated ACAs, and other affected adjacent authorities. Liaison officers may be required to accomplish mutual agreement and coordination.

## Section 4 – Air and missile defence commander

2.5 The COM JFC normally designates an AMDC with overall responsibility for AMD which includes theatre ballistic missile defence. The AMDC is normally the commander with the preponderance of AMD capabilities and the C2 means to plan and direct them. The AMDC is responsible for the production of a comprehensive air and missile defence plan. The AMDC establishes weapons control procedures and measures for all AMD forces and ensures the necessary warning information is provided to support civil defence and force protection activities. The AMDC is responsible for the production of the RAP within the JOA, as assigned. The AMDC promulgates and employs common procedures for AMD battle management, identification, and integration, including considerations for AMD support to maritime and land forces. Because of airspace concerns common to both AMD and airspace control, the AMDC is also normally dual hatted as the ACA.

## Section 5 – Component commanders

2.6 **Commander joint force air component.** The COM JFAC is the commander with the preponderance of air assets and the C2 capabilities necessary to plan and direct joint air operations.[7] The responsibilities of the COM JFAC, ACA, and AMDC are interrelated and are normally assigned to one individual. These responsibilities may be assigned to two or more individuals when the situation dictates. If the COM JFC decides not to assign these responsibilities to one individual, then close coordination between all positions is essential. The COM JFAC develops strategies and plans, recommends priorities, allocates resources and controls assigned air assets to achieve assigned COM JFC objectives. Having one commander with the responsibility and authority to coordinate and integrate AMD and airspace control greatly enhances airspace operations. Coordinated AMD and airspace control also enables the execution of offensive attacks against an enemy. See **Figure 2-1, *Airspace control command and control relationships*** for a notional illustration of airspace C2 relationships.

2.7 **Responsibilities of other component commanders.** Each component commander advises the COM JFC on the employment of their forces. For airspace control, and subject to the authority of the COM JFC, each component commander:

a. Within their component capabilities, provides airspace control in areas designated by the ACA in accordance with directives and procedures in the ACP and must be prepared to provide airspace control in other areas designated by the ACA when the ACS is degraded.

[7] For details on roles and responsibilities of the COM JFAC, see AJP-3.3, *Allied Joint Doctrine for Air and Space Operations.*

b. Forwards requests for CMs to the ACA via the JACC using the airspace control means request in accordance with the ACP. The ACA, through the JACC, coordinates with all component commanders' headquarters, including JFAC HQ.

c. Develops detailed airspace control instructions, plans, and procedures in accordance with guidance and direction in the ACP. These instructions, plans, and procedures should be coordinated with the ACA to ensure consistency with COM JFC-approved airspace control guidance and approved in accordance with directives and procedures in the ACP.

d. Provides necessary facilities and personnel for airspace control in assigned areas of operations and identifies these facilities and personnel to the ACA for inclusion in the ACP.

e. Provides trained personnel as representatives to the JACC to perform as liaison officers for the ACA.

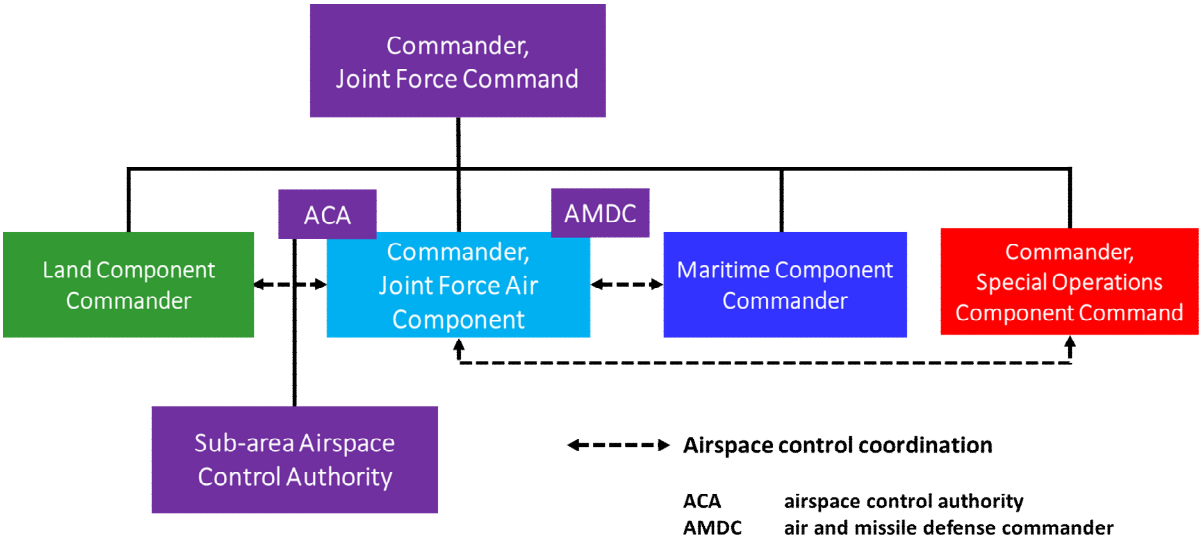


**Fig 2-1 Airspace control command and control relationships**

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# Chapter 3 – Airspace control fundamentals

## Section 1 – Airspace control area

3.1 The basic geographic element of airspace control is the airspace control area (ACAR), defined by its vertical and horizontal boundaries. The ACAR may coincide with a regional commander's area of responsibility (AOR) or the commander joint force command's (COM JFC's) joint operations area (JOA). There may be cases where the ACAR does not coincide with an AOR or JOA. It may be smaller due to national restrictions or International Civil Aviation Organization (ICAO) provisions, or larger to manage air operations outside an AOR or JOA. When ACARs overlap international boundaries or national interests are affected, applicable national and international laws must be considered.

## Section 2 – Coordination measures

3.2 Coordination measures (CMs) segregate, control, and/or reserve airspace for Allied operations, and support identification (ID) methods, thereby reducing the risk of friendly fire. Coordination Measures are initially identified during planning and should be understood by airspace control elements and airspace users. The airspace control means request (ACMREQ) is used to request a specific CM for inclusion in a future airspace control order (ACO) or when a change to the present ACO is needed. CMs are categorized as airspace control means (ACM), fire support coordination measures (FSCMs), manoeuvre control measures, air reference measures, air defence measures (ADMs), maritime defence measures, and air traffic control measures (ATCMs). CMs are listed and discussed at Annex B of this publication.

## Section 3 – Airspace control plan

3.3 The airspace control authority (ACA) prepares the airspace control plan (ACP), which is approved by the COM JFC, to establish agreed procedures within the ACAR. The ACP supports the achievement of objectives, while the air and missile defence plan (AMDP) integrates coherent procedures for an effective airspace control. Therefore, the ACP should be coordinated with the AMDP. The ACP should specify procedures for aircraft ID, the integration of air traffic services (ATS) and amplifying guidance on the CMs to be used. It should include instructions for airspace control operations to maintain the ability operate in a degraded environment. Airspace control needs to maintain operations by protecting and dispersing its vulnerabilities and dependencies. The ACP should specify the ACO development and production cycle and include the timelines for submission and coordination of CM requests along with ACO distribution and promulgation. The ACO cycle should be harmonized with the air tasking order (ATO) and the other component commands' planning cycles to include military and civil space operations. Finally, the ACP should consider ICAO procedures and interfaces with regional and international air traffic systems to facilitate the air traffic flow transiting the AOR/JOA. A list of key factors that should be considered during

the development of an ACP is provided in Annex A of this publication. Planners should consider the following when developing the ACP:

a. **Integration of civil and military air operations.** Broad areas of concern for developing the ACP include observance and understanding of relevant national and multinational air traffic control (ATC) responsibilities, regulations, and procedures. During a crisis, increased coordination is required between military airspace control and civilian ATC agencies to allow civil air traffic to continue to operate to the maximum extent possible while facilitating military air operations. During non-Article 5 crisis response operation (NA5CRO) the effect of military operations on civil air traffic needs to be considered as well. If civil aviation continues to operate within the ACAR, the ACA coordinates to ensure deconfliction between civil aviation, military aircraft and AMD activities.

b. **Consultation with the host nation.** The ACP should be developed in full consultation with the nation(s) responsible for providing ATS in the AOR/JOA and adjoining airspace. In a major crisis in which the host nation(s) is involved militarily, they may defer to the COM JFC. However, in NA5CROs, unless there is an overriding legal basis, the host nation may reserve the right to publish separate airspace control procedures unique to the mission. Close coordination is required with civil and military aviation representatives regarding regulations for civil operations in or near the AOR/JOA. Additional information on developing capabilities and capacity of local forces may be found within AJP 3.16, Allied Joint Doctrine for Security Force Assistance

c. **Integration with air and missile defence.** Airspace control activities must consider AMD fighter aircraft, surface-based air and missile defence (SBAMD), and the associated surveillance and control system for maximum effectiveness and risk management in accordance with COM JFC guidance. Furthermore, given that adherence to published airspace control measures can be a means of identification, close coordination between airspace control and AMD activities are vital for the timely identification and prosecution of enemy aircraft.

d. **Airspace control plan considerations.** The ACP should consider the following:

(1) Existing airspace structure, ATS regulations and procedures, national and international ATC facilities, and location of all aerodromes.

(2) Air, land, and maritime order of battle, location of high value assets, key installations, and AMD priorities according to the joint prioritized defended asset list.[8]

(3) Procedures to facilitate transit between adjacent ACARs should be established, coordinated, and contained in the respective regional ACPs.

(4) Where neutral countries are adjacent to the ACAR and are cooperative, airspace control procedures to transit those countries should be requested, coordinated, and published in the ACP.

(5) COM JFC airspace control risk guidance for all airspace users.

(6) Limiting factors, such as equipment limitations, electromagnetic interference, and C2 network requirements that may adversely affect the airspace control system (ACS).

(7) Airspace C2 architecture, planning and cycles, requesting procedures, ID criteria and rules of engagement (ROE).

(8) Mission profiles and cooperative ID or other aircraft ID capability and AMD systems operating in the ACAR.

(9) Adversary capabilities, especially regarding air surveillance, AMD, cyberspace and electromagnetic attack, and available information and intelligence on adversary likely courses of action, intentions and tactics, techniques and procedures.

(10) Procedures during periods of limited visibility, such as adverse weather and night.

(11) Contingency procedures, emergency procedures, battle damage, loss of communications or loss of cooperative ID capability.

(12) Procedures for civil air traffic transiting the ACAR.

(13) Provisions to support surge operations and high volumes of air traffic.

(14) Vulnerability of friendly aircraft and AMD systems to enemy activity and systems, to include risk for civil air operations.

[8] The joint prioritized defended asset list is a listing of identified and approved critical assets that are matched against limited defensive counter-air assets in an integrated overall defence design.

(15) Procedures for deconfliction of unmanned aircraft, land, and sea-based weapons.

(16) Joint fires, fires that cross the ACAR, ACA-sub area, and component boundaries.

(17) Airspace control elements, military or civil that can execute the ACP using positive and/or procedural control.

(18) Legal and policy framework i.e., the legal basis for the operation (e.g., UNSC Resolution mandate), the applicable national and international laws (International Human Rights Law and Law of Armed Conflict) and relevant rules of engagement.

(19) Crisis situations require increased coordination between ACA, airspace control, and ATC agencies and civilian aviation ATC.[9]

(20) Timing, validity, and distribution of relevant documents and/or orders, e.g., ACO, ATO, and special instructions (SPINS).

(21) Selection and use of a common reference system, e.g., Global Area Reference System.

(22) Provision of dedicated high-speed and low-speed air corridors and other means to deconflict air traffic.

e. Transitions: peace to/from armed conflict. The ACP should support an orderly transition from peacetime to armed conflict and back to peacetime operations. Such a transition could occur during a period of increasing tensions or suddenly without warning.

## Section 4 – Integration of airspace control with air and missile defence operations

3.4 Airspace control and AMD coordination, prioritization and integration are essential. Airspace control procedures can be used to assist in platform ID, facilitate engagement of enemy aircraft and missiles, and provide safe passage of friendly aircraft. Normally if the commander joint force air component (COM JFAC), ACA, and air and missile defence commander are the same individual, these functions are unified in the command facility supporting joint force air component (JFAC) activities, e.g., Headquarters Allied Air Command (HQ AIRCOM) air operations centre (AOC) in Ramstein.

[9] See AC/92-D(2013)0009, *Guidelines for ATM Coordination in Crisis Situation.*

a. ROE and airspace control procedures should provide AMD forces the freedom to engage enemy aircraft and missiles while simultaneously preventing unintended engagements or damage to friendly or neutral aircraft or property. Procedures should be simple to execute for both airspace users and AMD forces. Procedures may include visual, electromagnetic, geographic, and/or manoeuvre means for ID. AMD operations should not unnecessarily affect air operations by creating overly complicated or lengthy air route structures.

b. When engaging enemy aircraft and missiles, AMD fighters and SBAMD must be fully coordinated to optimize all available capabilities. Establishment of different weapon engagement zones provide flexible options to address legal and policy constraints, risk and operational requirements.

## Section 5 – Methods of airspace control

3.5 Methods of airspace control vary across combat and non-combat activities. The methods of airspace control are employed within an ACAR are positive, procedural, or a combination of the two. Airspace control should be responsive to evolving enemy threat conditions and changing tactical situations. The COM JFC decides, based upon ACA recommendations, the appropriate methods for airspace control based on the overall concept of operations. The two methods of exercising airspace control are:

a. **Positive control.** Positive control relies on surveillance, accurate ID, and communications between ACA-designated airspace control elements and all airspace users. It is normally conducted by airspace control elements equipped with radar; identification, friend or foe interrogators and receivers; beacons; track processing computers; digital data links; and communications equipment. The minimum requirements for surveillance, ID, and communications equipment vary in each theater and are driven by a combination of military and civil aviation regulations and the level of risk the COM JFC is willing to accept.

Positive control procedures must include provisions for transition to procedural control if positive control systems are degraded or become unavailable. Those procedures must also consider differences between civil and military communications and surveillance systems. Positive control may not be reliably applied to all airspace users at the same time (e.g., indirect fires, unmanned aircraft) due to volume of traffic, which may require prioritization and sequencing. In these instances, airspace planners should develop and promulgate procedural control measures in the ACP, ACO and SPINS as required. Due to its reliance on these systems, positive control is susceptible to cyberspace incidents and electromagnetic attack. When positive airspace control is degraded or degraded, procedural airspace control measures can provide a means to safely operate.

b. **Procedural control.** Procedural control relies on common procedures, designated airspace, and promulgated instructions by airspace control elements to deconflict and activate ATCMs, ACMs, some FSCMs, and ADMs. Procedural control activates airspace by defined volume and time through standard CMs and/or updates to weapons control status. This serves to deconflict the airspace and aircraft from other airspace users. Procedural control establishes the minimum common criteria and concepts for airspace control. Procedural control provides effective airspace control for low-density airspace situations, land combat operations, and in areas that lack positive control coverage. Procedural control measures should be uncomplicated, readily accessible to all forces, and disseminated in the ACP, ACO, and ATO/SPINS, when appropriate. Use of these documents is essential for the planning and integration of all airspace users. Procedural control is less vulnerable to enemy cyberspace and electromagnetic attack. **Figure 3-1, *Airspace control methods*** compares positive and procedural airspace control. Procedural control includes dynamic procedural control as discussed in Allied Tactical Publication (ATP)-3.3.5.1 *Joint Airspace Control Tactics, Techniques and Procedures.*

Within the bounds of a specified ACM or FSCM, further deconfliction by time and/or geographic location can be coordinated by appropriate organisations, which have sufficient situation awareness of the operations. Dynamic procedural control potentially gives the coordinating organisation the flexibility to enable dynamic adjustment of plans and reallocation of resources in response to operational developments. This procedure may be solely a coordination function with airspace control being retained by the ACA.

Dynamic procedural control is usually focused on a specified area covered by a restricted operating zone (ROZ) or high-density airspace control zone in which the operational tempo requires maximum efficiency in airspace usage. It may be resource intensive, particularly in terms of personnel and communications, which may have limited operational duration. A commander at any level may implement dynamic procedural control, provided the requisite means are available, but must keep the ACA informed.

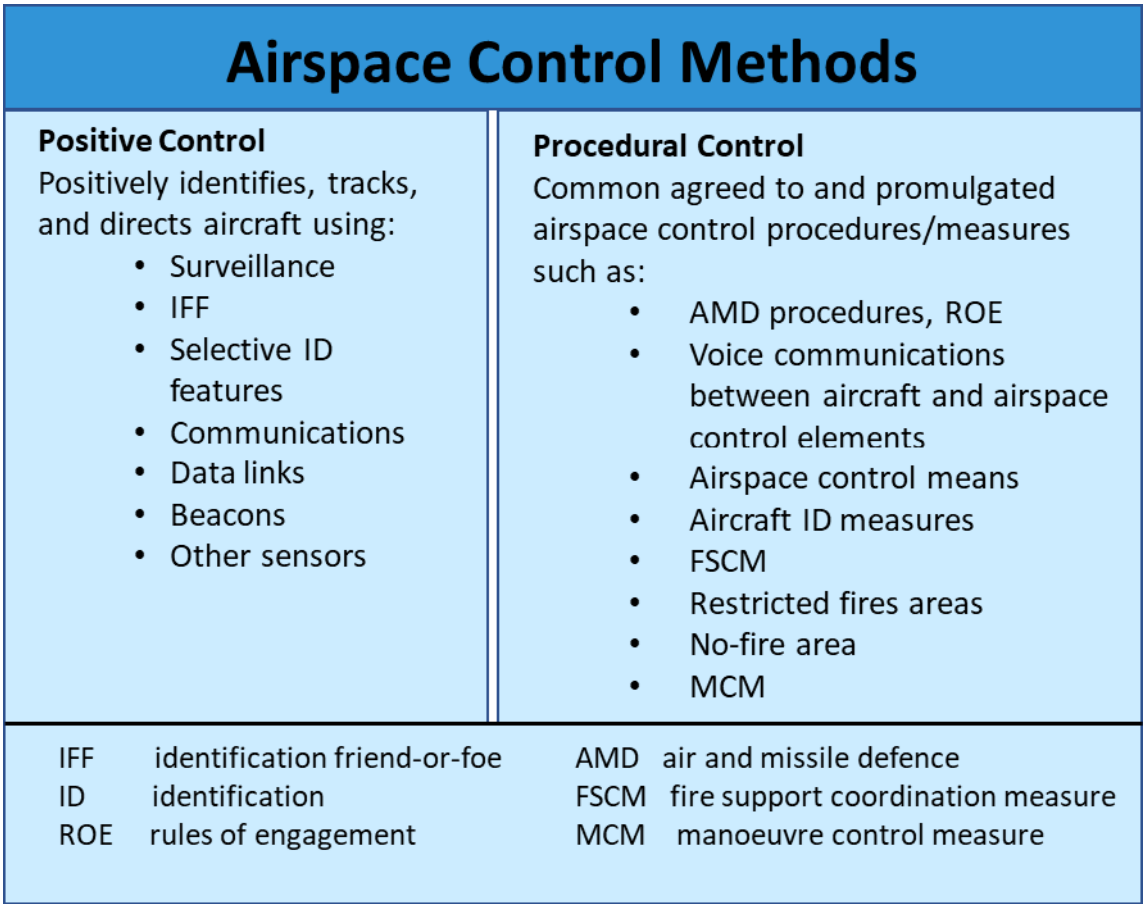


**Fig 3-1 Airspace control methods**

3.6 There is a continuum of risk, efficiency, and cost between procedural and positive control. Uncontrolled airspace reduces the demand on airspace control resources but increases risk. Standing procedural CMs such as a ROZ, provides the user free access, incrementally restrict access to other airspace users and does not provide the best risk mitigation. Military or civilian positive control provides the best risk mitigation but has a large demand on airspace control resources. However, limited resources, terrain or the lack of integration may make positive control of the entire ACAR unrealistic. Using the COM JFC's risk guidance, airspace planners should determine the areas where the need for efficiency is highest and establish the appropriate combination of positive and procedural control. In these instances, the two methods are complementary. Dual employment is driven by considerations such as intended use of the airspace and available control resources. During an operation, these considerations may drive changes to the balance between positive and procedural control methods employed. In areas where positive control is not feasible, standing CMs should establish the minimum standard for airspace control. These standing measures form a crucial backup in the event positive control capability is degraded.

## Section 6 – Airspace control agencies

3.7 The ACA exercises airspace control authority through a variety of airspace control elements and agencies. Airspace control relies upon airspace management capabilities provided by airspace control elements. For most NATO airspace control activities, the ACA resides at the HQ AIRCOM AOC at Ramstein. **Figure 3-2, *Notional airspace control elements*** provides an example of an airspace control structure. Other agencies supporting airspace control include:

a. Combined air operations centres (CAOCs), located in Uedem, Germany and Torrejon, Spain, and a deployable air command and control centre (DACCC) which is based in Poggio Renatico, Italy.[10] The CAOCs are composed of two entities; the static air and missile defence cell responsible for air policing and the deployable air operations centre which during crisis form parts of the JFAC structure.

b. Control and reporting centres. Control and reporting centres (CRCs) are fixed or mobile ground-based units with long-range air surveillance radars and voice and data communications capabilities. Radars and communications systems can be co-located with the CRC in remote/forward-deployed locations. The CRC has the capability to import and display non-organic track data via tactical datalinks. The CRC usually provides persistent 360-degree wide-area surveillance, ID, early warning, positive and procedural airspace control, AMD, battle management, and data link management.

c. Airborne warning and control system. Airborne warning and control system (AWACS) aircraft have a long-range air and maritime surveillance radar, data communications capabilities and other mission sensors. It is normally one of the first capabilities deployed during a crisis or heightened tensions. AWACS is an integrated C2 platform providing persistent 360-degree surveillance, intelligence, early warning, positive and procedural airspace control, AMD, ID, battle management, and data link management.

d. Air traffic control. Military and civil ATS facilities (as required) providing terminal, en route control and flight information service.

e. Air Support Operations Centre (ASOC). An agency of a theatre air control system collocated with a corps headquarters or an appropriate land force headquarters, which coordinates and directs close air support and other tactical air support. Collocated with a corps headquarters or an appropriate land force headquarters, the ASOC plans, coordinates, integrates and deconflicts close air support, joint fires and other tactical air support.

f. Other component airspace control elements. These activities, such as maritime

[10] For details on the CAOC and the deployable air command and control centre, see AJP-3.3, *Allied Joint Doctrine for Air and Space Operations.*

tactical air coordination centres, air support operations centre (ASOC), ships with airspace control capability, army aviation airspace controllers, fire support coordination centres, and tactical air coordinators (airborne), provide airspace control within component assigned airspace.

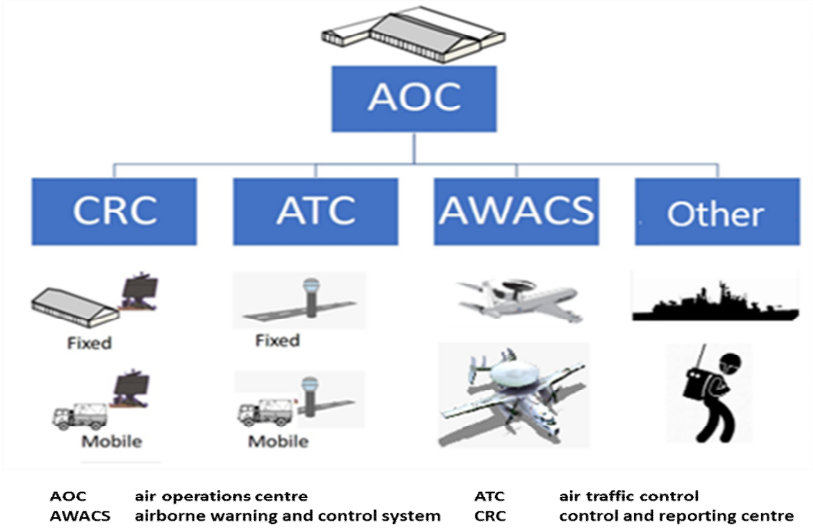


**Fig 3-2 Notional airspace control elements**

## Section 7 – Coordination measures selection

3.8 The ACA, in coordination with component and subordinate commanders, selects those CMs from the ACP that are most suitable for the ACAR and accomplishment of the mission, and where necessary, may identify additional procedures. If CMs conflict, the ACA will coordinate with requesters to resolve and specify priorities, with full details reflected in the ACP, ACO, and ATO/SPINS. If these cannot be resolved by the ACA and the airspace users concerned, the matter should be referred to the COM JFC for resolution. Additional means that may be included in the ACP are detailed in appropriate operational plans. CMs for use in airspace control planning and operations are listed in Annex B of this publication.[11]

## Section 8 – Operation of the airspace control system

3.9 **Airspace control means request.** Each commander controlling airspace users should constantly evaluate and determine future requirements for airspace and coordinate these with the ACA. However, the ACA must be prepared to coordinate unanticipated urgent requests due to changing operational situations. These requests could include a component commander requesting immediate use of a specific airspace for fires or aircraft. Real-time coordination, integration, and deconfliction of airspace and joint fires and missiles with airspace control elements and C2 nodes are essential in fluid situations. The COM JFAC may

[11] For additional CM details, see ATP-3.3.5.1 *Joint Airspace Control Tactics, Techniques and Procedures*.

require corridors or routes for friendly forces. Subordinate echelon with localised airspace requirements should submit requests for the establishment, activation, and deactivation of CMs and/or associated procedures to the ACA via ACMREQs. Unless otherwise specified in the ACP, the ACMREQ message format should be in accordance with Allied Procedural Publication (APP)-11, NATO Message Cataloque.[12] The joint airspace coordination centre (JACC) correlates all requests and manages any conflicting requirements.

3.10 **Airspace control order.** When all requests have been correlated and conflicts resolved, the JACC promulgates the activation of pre-planned CMs and/or procedures, and other airspace control information by issuing an ACO. CMs and associated procedures are valid for the period of the ACO or a specified time frame. ACO planning should be synchronized with the overall planning processes, particularly the ATO planning cycle. The ACO message format is based on Allied data processing publication (ADatP)-03, NATO Message Text Formatting System and formatted per APP-11.

3.11 **Issue of an airspace control order.** An airspace control system (ACS) can only be effective if airspace control information is disseminated in a timely fashion to airspace users. The ACO should be transmitted well before it becomes effective so information can be extracted and passed to appropriate personnel in a timely manner. During periods of increased operations tempo (e.g., air operations supporting a ground offensive), ACO changes may be frequent during the ACO's effective period. In these circumstances, ACO changes should be distributed to affected units and agencies as soon as possible.

3.12 **Continuity of operations.** To ensure continuity in providing airspace control in a degraded environment, the ACA should establish procedures. Airspace control needs to be able to operate in a degraded environment by protecting and dispersing its vulnerabilities and dependencies and employing mission command as applicable. Delegation of airspace control responsibility within established conditions should be approved by the COM JFC and published in the ACP.

[12] See Annex C for ACMREQ format.

# Chapter 4 – Operational considerations

## Section 1 – Operational requirements

4.1 Developing an airspace control system (ACS) requires extensive planning. National and international regulations must be considered and may not automatically be waived. The designated airspace will likely be used by all components as well as by civilian aviation. In non-article 5 crisis operations (NA5CRO), there may be a requirement to set-up and operate air traffic services (ATS) that meet both military and civilian requirements and allows for the transition to and from the operations area.

4.2 Each area of responsibility or joint operations area (JOA) has specific operational requirements for airspace control. These requirements should be determined as early as possible to incorporate them into the overall joint force planning effort. Political constraints, national air traffic control (ATC) systems regulations and procedures, military airspace control systems, and the capabilities and limitations of these systems are all important considerations. Rules of engagement (ROE), disposition of air and missile defence (AMD) weapons, fire support plans, and aircraft identification (ID) procedures are also important items that should be considered. Every joint force is different, based on the mission to be accomplished, forces assigned, and the command structure established by the commander joint force command (COM JFC). In most cases, these forces will have specific operational requirements for airspace that must be addressed when developing the airspace control plan (ACP).

## Section 2 – Planning considerations

4.3 **Planning process.** The airspace control authority (ACA) should assemble the joint air coordination centre staff and include representatives/liaison elements from all components, participating agencies and the host nation to identify airspace requirements. This staff should complete all phases of planning, developing, or updating of an ACP for COM JFC approval. The ACP should be developed in coordination and parallel with the COM JFC and other component commanders' planning efforts.

4.4 **Synchronized planning.** The COM JFC's campaign plan or operation plan (OPLAN); the air, land, and maritime plans; the air and missile defence plan (AMDP); and the ACP should be synchronized. Input from all commands, agencies, and organizations should be consolidated, and the final ACP developed and disseminated to all users. The ACP should be added as an appendix to the operations annex of the campaign or OPLAN.

4.5 **Contingency planning.** When a contingency situation necessitates rapid deployment and employment of forces, existing plans should be used if possible. If there is no approved OPLAN or previously established ACP, the ACA, as directed by the COM JFC, should establish a temporary ACS responsive to immediate operational and tactical requirements.

In either case, the ACA implements the planning and coordination requirements to modify or adjust the ACS as the operating environment changes.

4.6 **Airspace control risk.** The assumption of airspace control risk is a command responsibility and should be consistent with the COM JFC's acceptable level of risk. The COM JFC's acceptable level of risk for all airspace users (including fires) should be clearly discussed in the ACP. Definitions of high, moderate, and low risk vary. In general terms, high risk prioritizes mission accomplishment over the preservation of resources; moderate risk seeks to balance mission accomplishment with potential loss of resources; and low risk prioritizes the preservation of resources. Airspace control must be flexible enough to adjust to changes such as the volume and types of airspace users. The ACP should identify areas where high volumes of airspace users are anticipated and project the need for enhanced airspace control capability. If enhanced airspace control capability is not an option, commanders must accept higher risk or direct measures to reduce the volume of users to an acceptable level. Commanders may also accept different levels of risk based on the types of airspace users involved. For example, a commander may direct that a higher level of risk be accepted for possible friendly fire incidents between indirect fires and some or all unmanned aircraft (UA) than between indirect fires and manned aircraft. See **Table 4-1, Notional airspace control risk matrix** for an example of a risk matrix.

| Risk To | Risk From | Acceptable Risk | When to Accept Risk |
|---|---|---|---|
| **Civil Aviation** | **Any Military System** | **None** | **Never** |
| **Manned Aircraft** | **Indirect Fires** | **A trajectory no closer than 1 km of rotary-wing and 2 km of fixed-wing aircraft** | **1. Immediate fires in support of troops in contact.<br>- And -<br>2. Ground commander approval.** |
| **Manned Aircraft** | **Unmanned Aircraft** | **2 km lateral and 1 km vertical separation.** | **1. Immediate air support to troops in contact.<br>- And -<br>2. Manned aircraft pilot accepts responsibility for separation.<br>- And -<br>3. Ground commander approval.** |
| **Unmanned Aircraft** | **Indirect Fires** | **Trajectory no closer than 1 km to unmanned aircraft. Distance may be reduced for small, unmanned aircraft.** | **1. Owning surface commander or above for component unmanned aircraft.<br>2. Consult with owning component commander for other component unmanned aircraft.** |

**Table 4-1 Notional airspace control risk matrix**

4.7 **Fires integration.** Airspace control procedures increase in complexity and detail when air forces operate in proximity to, or in conjunction with, surface forces. Each JOA is typically defined by specific boundaries and may contain multiple coordination measures (CMs) such as airspace control means (ACM) and fire support coordination measures (FSCMs) to facilitate operations. Close coordination is required to integrate and deconflict air operations with the employment of surface fires and is normally accomplished by the Component fire support agencies establishing FSCMs. Integration and deconfliction of airspace and surface fires normally occurs during planning but may require real-time adjustments based on actual

operations. Procedures and CMs are discussed in the ACP and disseminated via the airspace control order (ACO) through appropriate airspace control and other command channels.

4.8 **Airspace control assessment.** Assessment is a continuous process that measures progress toward achieving COM JFC's airspace control objectives and the airspace control process for efficiency and effectiveness. The ACA and staff determine assessment actions and measures during planning and use these as assessment data points. Measures are both quantitative and qualitative and apply at the operational and tactical levels. Tactical airspace control assessment provides a significant source of information for performing operational airspace control assessment since most tasks are accomplished at the tactical level. Examples of tactical assessments include effectiveness of CMs in supporting air, land, space and maritime operations, ACM and FSCM conflicts, and efficiency of ATC procedures. Airspace control agencies and airspace users work with airspace planners to modify the current ACO, subsequent ACOs, the ACP, and various forms of ATC guidance, e.g., aeronautical information publications. These efforts, in turn, inform the operational level assessment performed by the ACA and staff. The results of operational level airspace control assessment are forwarded to the joint force air component strategy division operations assessment section and used to inform the commander joint force air component (COM JFAC) assessment of air operations provided to the COM JFC to support the overall assessment effort.

4.9 **Force protection**. Force protection measures can have an impact on ATC and on the operations of airfields, aerial ports, air terminals, and heliports. The use of restricted areas around sensitive facilities is commonplace.

4.10 **Other considerations.** An effective ACP plans for the full range of airspace control from full capacity to partial or full degradation, and provides appropriate guidance, e.g., procedures for transition from positive to procedural airspace control. Planners should anticipate the effects of enemy cyberspace and electromagnetic attacks on the ACS and provide degradation guidance, e.g., primary/secondary radars, communications frequency plans. Emissions control procedures and electromagnetic interference guidance should also be addressed.

## Section 3 – Unmanned aircraft

4.11 UA[13] may be operated in the airspace control area (ACAR) by all components, government agencies, and private and commercial entities. Established airspace control procedures used in manned flight operations normally apply to UA operations. However, UA may be difficult to visually acquire and do not always provide a clear radar or electromagnetic signature, presenting a potential hazard to other aircraft. Moreover, positive ID of friendly, hostile, and neutral UA, particularly small UA, may be difficult. Thus, UA operations require special airspace control considerations, as well as trained UA operators. Specific UA volumes

[13] UA refers to an aircraft. Unmanned aircraft system refers to the aircraft and its associated control system, personnel, and support equipment.

of airspace may need to be included in the ACP and ACO. The COM ACA may need to establish standing bilateral/multilateral agreements to support the employment of large UAs (e.g., NATO Alliance Ground System) operating at high altitudes for extended periods and provide details in the ACP, air tasking order (ATO) and special instructions (SPINS). Efforts should be made to integrate UA with manned flight operations to enable a more flexible and adaptable ACS.[14]

4.12 Several characteristics of UA present challenges for airspace control:

a. UA communication links are generally more critical than those required for manned systems, and UA typically rely on near-continuous data exchange for flight control and payload management. Therefore, communications security, and specifically bandwidth protection from both friendly electromagnetic interference and enemy cyberspace and electromagnetic attack, is imperative. In the event of loss of its datalink, a UA will fly its programmed lost-link profile, which may include a loiter to allow attempts to regain communications, continue to a divert airfield (if able) or return to its home base. Airspace planners and UA operators should plan for and clearly communicate in the event of this contingency.

b. UA are typically not as robust as manned aircraft when environmental extremes are encountered. Wind, precipitation, turbulence, and icing can significantly degrade or altogether nullify UA platform and/or sensor capabilities.

c. Generally larger UA have longer endurance times than comparable manned aircraft, and thus these UA may be tasked multiple times on a single ATO and/or their mission may span multiple ATOs.

4.13 Friendly airspace control and AMD nodes must be able to differentiate between friendly and hostile UA using both positive and procedural means. The ACP, AMDP, ATO and SPINS should also minimize the potential for enemy exploitation of UA airspace control and AMD ID procedures. For example, the use of the coordination level and slow aviation assets flight route[15] by smaller UA can enable efficient and timely use of the airspace, while aiding AMD forces to differentiate between friend and foe. This procedural type of airspace control means. Therefore, UA operators must follow prescribed airspace control and AMD ID procedures to prevent friendly fire and support counter-UA operations against threat UAs.

[14] See ATP-3.3.8.2, *Unmanned Aircraft System Tactics, Techniques and Procedures* for additional details on UA operations.

[15] The CL is an ACM used to separate fixed and rotary wing aircraft by determining an altitude below which fixed wing aircraft normally will not fly. The SAAFR is an ACM established below the CL to facilitate movement of slow-moving aircraft in the forward area in direct support of ground operations. See Annex B for details.

## Section 4 – Transition from peacetime to combat operations

4.14 The ACA should provide the COM JFC with an ACP that is continually updated in peacetime and throughout joint force operations. Peacetime airspace rules and organizations may change during actual conflict, and the nature of these changes varies from theatre to theatre. During NA5CRO, special constraints may be imposed on airspace control. The ACP should provide instructions to transition between peacetime and combat operations as required.

## Section 5 – Identification methods

4.15 ID is the process of assigning an accurate characterization of a detected object by any act or means so that high confidence real-time decisions, including weapons engagement, can be made. ID process is conducted by the ID authority using approved criteria and determines if the unidentified object is friendly, neutral, hostile or unknown. ID authority and ID criteria should be stated and discussed in the COM JFC approved AMDP and ACP. Both ID authority and criteria may require modification, sometimes in conjunction with ROE, in a dynamic operational environment and/or with operational changes. The COM JFC normally delegates ID authority to the COM JFAC and authorizes further delegation to subordinate commanders for decentralized execution as allowed by ROE and necessitated by the operational situation. Identification is an essential and inseparable part of airspace control and AMD. Comprehensive surveillance and accurate persistent tracking combined with timely, and reliable ID enhances situational awareness, provides threat warning, improves weapons employment options, helps conserve friendly resources, and reduces the friendly fire. The methods of ID may vary between operations and ROE, and commanders of adjacent areas should coordinate their procedures.

4.16 **Identification Friend or Foe Mode 5 and Combat Identification.** Identification, friend or foe (IFF) Mode 5 is the theatre entry standard (TES) for operating platforms. Mode 5 performs the same core function as IFF Mode 4, which is now obsolete, it adds new functionality such as additional data and lethal interrogation. Further details can be found in the NATO Concept of Operations for IFF/Secondary Surveillance Radar. It is crucial that Mode 5 baseline procedures are understood at all operating levels within the operating area to minimise the risk of friendly fire. The use of Mode 5 lethal interrogation must be tightly controlled within the operating area and must not form part of the combat ID decision process. Use of lethal interrogation as part of the engagement sequence should be minimised as a friendly fire prevention measure only. The ACA ensures platforms comply with Mode 5 TES and details specific procedures via standing SPINS.

4.17 ID procedures are implemented in accordance with Allied Communications Publication-160, and authorized ROE. There are different methods for ID such as cooperative object ID, non-cooperative object ID, and procedural ID.

a. **Cooperative object identification.** Cooperative objects contribute to their ID based on replies given in response to interrogations or via self-provision of own ID via Secure Means (via Tactical Data Link), usually executed by technical equipment.

b. **Non-cooperative object identification.** Non-cooperative objects do not provide responses to interrogations and require a different ID method. Suitable procedures are those which detect characteristic signatures and subject them to pattern recognition processes. This method uses sensors capable of detecting, interpreting, and allocating images, sounds, or electromagnetic emissions to ID characteristic signatures, often combining different sensor data.

c. **Procedural identification.** Procedural methods ID objects based on their flying (altitude, speed, routing) or other moving behaviour in accordance with procedures in the ACP. Therefore, for this method it is essential that friendly and civil aircraft flight plans and space operations are pre-coordinated to contribute to timely ID.

## Section 6 – Theatre missile deconfliction

4.18 Theatre missiles, such as surface and air launched cruise missiles, are standoff weapons fired from a launch point on a pre-programmed flight profile to a designated target. Because these missiles are high speed, manoeuvrable, and have a small radar cross-section, they are difficult to track with surveillance radars supporting airspace control and AMD. Without the ability to have reliable tracking, positive control is not a possible means to deconflict theatre missile operations from other air operations. Thus, procedural control using CMs should be established in the ACP, ACO, ATO and SPINS for these weapons. CMs for theatre missiles normally include restricted operating zones for launch and target location, air corridors, and time deconflictions.

## Section 7 – Airspace control in non-article 5 crisis response operations

4.19 With NA5CROs, NATO forces may be called upon to undertake a variety of missions. NA5CROs are generally confined to a specific geographic area and are often characterized by significant constraints on forces, weapons, tactics, and the level of force permitted. Depending on the environment and mission, the degree of control may be rigorous and the ROE restrictive.

a. **Peace support operation**. Peace support operations can involve all air missions including aircraft of all components. These are the missions most likely to fluctuate from combat to noncombat, and back again. For coordination and deconfliction purposes, it is important that components' organic air assets appear on the ATO[16] in as much detail as possible, and their airspace requirements are included in the ACP

[16] All component air assets (e.g., some Army helicopters, small UAs) may not appear on the ATO when operating below the coordination line.

and ACO. Rigorous control of all flights within the JOA may be necessary due to the potential mix of friendly and neutral military aircraft, civil aircraft (to include those operated by non-government organizations), and possible adversaries, as well as other mission constraints.

b. **Stability operations.** The ACA develops and promulgates rules and conditions in support of airspace which may previously have been under enemy control. This airspace could still pose a risk to air operations. Conditions may be imposed on enemy use of the airspace along with the legal authority for established conditions. The formulation of rules and conditions must consider the potential challenge to Allied air operations.

c. **Other types of operations**. NATO forces may be called on to participate in other types of NA5CROs, such as intelligence, raids, or rescue missions. In these operations, it may not be possible to implement some of the airspace control procedures described in this publication. When conducting these missions, joint forces may encounter hostile opposing military forces so airspace control will have to adapt accordingly. Airspace planning for these operations, however informal or brief, should include:

(1) Deconfliction between units, ATS, airfields, and aircraft performing the military mission, as well as civil and other types of airspace users.

(2) Timely and effective implementation of appropriate airspace control procedures if hostilities result.

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# Chapter 5 – Maritime and amphibious operations

## Section 1 – Introduction

5.1 When maritime operations are conducted by an Allied joint force, the commander joint force command (COM JFC), through the airspace control authority (ACA), normally designates the maritime component commander (MCC) as a sub-area airspace control authority (SACA). For amphibious operations, the COM JFC, as ACA, may designate the commander amphibious task force (CATF) as a SACA. This should be specified in the operation plan and airspace control plan (ACP). These commanders and their airspace planners participate in the overall planning process and resulting airspace control requirements are incorporated into the ACP. Because of the environment in which maritime forces operate, some maritime airspace control procedures differ from those used in land and air operations. In addition, during allied/joint operations in littoral areas, and particularly for amphibious operations, specific airspace control procedures adopted may be unique, or a composite of those procedures used in the land and maritime environments. The maritime or amphibious task force commander should ensure close coordination of coordination measures (CMs)[17] used when land, air, space, special operations, and maritime forces operate within the same ACAR. Exchange of liaison personnel trained in, and knowledgeable of, the different airspace control procedures, and integration of the airspace control system facilitates coordination of flight information, clearance of aircraft to enter and depart adjoining sectors or areas, and coordination of airspace control.

## Section 2 – Airspace control in maritime and amphibious operations

5.2 A maritime force complies with the ACP, air tasking order (ATO) and special instructions (SPINS), and procedures in Allied Joint Publication (AJP)-3.3.3, *Allied Joint Doctrine for Air-Maritime Coordination* and Allied Tactical Publication (ATP)-3.3.3.1, *Air-Maritime Coordination Procedures*.

a. **Coordinated air/sea procedures.** The MCC and joint force commander (COM JFAC) coordinate the application of coordinated air/sea procedures (CASP).[18] CASP provide a structure for coordinating air and missile defence (AMD) or anti-air warfare (AAW) operations when AMD capable warships are operating in, or adjacent to, a joint operations area (JOA). Warships may operate under one of three CASP control statuses. This permits them to contribute, to varying degrees, to AMD and coordinate their AAW operations with land-based aircraft or weapon systems. The command and control and communications arrangements inherent to CASP ensure that enemy air and missile threats are engaged effectively, and friendly and neutral aircraft are not endangered by naval forces. CASP contribute directly to effective AMD and airspace

[17] See Annex B for details of maritime defence measures and other CMs.

[18] See ATP-3.3.3.1, *Air-Maritime Coordination Procedures* for additional CASP details.

control. A ship's primary tasking, capability, and operational area determines the CASP control status that may be allocated. The three CASP control statuses are:

(1) **CASP Control Status A**. The primary task of a CASP Control Status A ship is to assist the respective air operations centre (AOC) in compiling the recognized air picture (RAP). Additional tasks, as directed by the air and missile defence commander (AMDC) or AOC commander, may include fighter control and engagement of adversary aircraft. Ships operating under CASP Control Status A are allocated to the shore-based AMDC for AMD duties as their primary task. If CASP Control Status A status is ordered, the MCC delegates TACON to the COM JFAC who may, in turn, delegate this tactical control (TACON) to the AMDC. Operational control (OPCON) and the responsibility for logistic support always remains with the MCC.

(2) **CASP Control Status T**. The primary task of a CASP Control Status T ship is to assist the respective AMDC in compiling the missile defence picture. Additional tasks, as directed by the AMDC, may include engagement of adversary ballistic missiles. Ships operating under CASP Control Status T are allocated to the shore-based (regional) AMDC for (T)BMD duties as their primary task. If CASP Control Status T status is ordered, the MCC delegates TACON to the COM JFAC who may delegate TACON to the AMDC. OPCON and the responsibility for logistic support always remains with the MCC.

(3) **CASP Control Status M**. CASP Control Status M is the standard status for maritime units; TACON is usually delegated to an officer in tactical command (OTC) to achieve the respective maritime mission. Capable units may assist the respective AOC in compiling the RAP if the maritime mission permits. If operating inside a JOA the use of long-range or medium-range surface to air missiles or allocated combat air patrol against targets that do not pose an immediate threat to the ship or units being supported is coordinated with the respective AOC.

b. **Amphibious objective area.** Amphibious operations are conducted in a defined area known as the amphibious objective area (AOA) or AOO with a high-density airspace control zone (HIDACZ). The location and size of an AOA may have considerable effect on, and implications for, the ACP. The airspace associated with an AOA can impact other operations and existing airspace control structures and requires coordination at the joint force level. Tasking and handover procedures for operations within the AOA should be as flexible as possible.[19] The AOA is a manoeuvre control measure.

[19] See ATP-08, *Doctrine for Amphibious Operations,* for additional details on AOA Airspace control.

## Section 3 – Responsibility for airspace control during maritime operations

5.3 A maritime commander's airspace control area (ACAR) or sub-area is geographically defined and generally referred to as the force air coordination area (FACA). The FACA is an airspace control means area surrounding a force within which airspace control and AMD measures are required to prevent mutual air interference between friendly surface and air units and their weapons systems. Normally the FACA coincides with the AAW area or the area of anti-submarine warfare (ASW) direct support, whichever is larger. Responsibility for airspace control within a FACA[20] is established as follows:

a. **Airspace control authority.** If the ACAR assigned to the ACA covers the MCC's areas (AOA, FACA) the ACP is typically planned by the ACA with the anti-air warfare commander (AAWC) given responsibility for tactical execution of CMs within the FACA or designated area. The ACA ensures these authorities are clearly coordinated and defined in the ACP.

b. **The officer in tactical command.** The OTC retains overall responsibility for airspace control within the assigned operational area. However, responsibility for the detailed planning and implementation of airspace control is normally delegated to the AAWC and the air coordinator, who may be combined in the same unit.

c. **The anti-air warfare commander.** The AAWC normally plans and executes the air battle including the employment of AAW aircraft. The AAWC establishes the air coordination policy for use within the FACA and is responsible for the associated CMs. The designated air coordinator, who executes the coordination plan supports the AAWC in this respect. The anti-surface warfare commander and the ASW commander assign tasks to aircraft employed in their warfare areas and remain in compliance with the overall ACP.

## Section 4 – Responsibility for airspace control in an amphibious task force

5.4 Where an airspace control system (ACS) is established in the JOA and the scale of the air operation supporting the amphibious operation justifies it, the CATF may be designated as a SACA until the operational need no longer exists. In this case, the CATF, through a tactical air control centre, controls the ACS and has responsibility for the CMs within the AOA. Otherwise, the ACA controls the entire ACS through the joint airspace coordination centre (JACC), although it is likely the CATF will have the responsibility for the CMs. When the FACA covers a large littoral area, a sector or local AAWC may be delegated authority to enforce the CMs within the AOA. Where no ACS is established prior to the amphibious operation, the CATF provides airspace control until responsibility can be transferred to a designated ACA with a supporting JACC. If only an area of operations is established and not an AOA, the

[20] See ATP-01, *Allied Maritime Tactical Instructions and Procedures*, AJP-3.3.3, *Allied Joint Doctrine for Air-Maritime Coordination* and ATP-3.3.3.1, *Air-Maritime Coordination Procedures* for more detail.

amphibious force normally requests the ACA establish a high-density airspace control zone over this geographic area.

## Section 5 – Conduct of maritime airspace control

5.5 The following specific elements are used in the conduct of maritime airspace control within the FACA and/or AOA:

- Maritime identification (ID) procedures.
- Maritime weapon coordination procedures.
- Maritime CMs.[21]

## Section 6 – Maritime handover and identification procedures

5.6 To facilitate the ID and handover of aircraft, specific ID procedures are used by maritime units.[22] Detailed ID criteria and procedures are published in the operational task anti-air warfare (OPTASK AAW) message, the ACP, airspace control order (ACO) or ATO and SPINS.

## Section 7 – Maritime weapon coordination

5.7 In maritime operations, weapon coordination may be carried out by area, zone, or joint procedures.[23] The type of weapon coordination in effect is promulgated in the ACP, ACO, ATO/SPINS, the OPTASK AAW message, and/or voice procedures from Allied Procedural Publication (APP)-01, *Allied and Multinational Maritime Voice Reporting Procedures*, using code words.

a. **Zone coordination.** A type of weapon coordination within the FACA where fighters and surface-to-air missiles (SAMs) are employed in fighter engagement zones (FEZs) and missile engagement zones (MEZs), joint engagement zones (JEZ), respectively, and a crossover zone (COZ) is established. In zone coordination, FEZ, MEZ, JEZ, and COZ are delineated by sector, altitude, and/or range and bearing from an appropriate origin. This is the normal method of weapons coordination used in the maritime environment. In littoral operations, coordination with the ACP and air and missile defence plan may require the development of composite procedures, and zone coordination is more likely to be established.

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[21] See ATP-01, *Allied Maritime Tactical Instructions and Procedures,* AJP-3.3.3, *Allied Joint Doctrine for Air-Maritime Coordination,* ATP-3.3.3.1, *Air-Maritime Coordination Procedures,* and ATP-3.3.5.1, *Joint Airspace Control Tactics, Techniques and Procedures,* Annex B for more details.

[22] See AJP-3.3.3, *Allied Joint Doctrine for Air-Maritime Coordination,* for handover procedures details.

[23] See ATP-01 Vol.I EDG V1 for more details.

b. **Area coordination.** A type of weapon coordination within the FACA where fighters, SAMs, and other weapon systems can be employed in the same airspace volume. MEZs, FEZs, JEZ, and COZ may be nominated but are not activated ready to revert to zone coordination. Area coordination is only used when a reliable RAP and communications exist and AAW coordination is of a high standard.

c. **Joint coordination**. Weapons coordination is made in the dedicated area, but friendly assets, ships or aircraft are protected by a Protection Zone (PZ) around each of them. Outside of these zones, area coordination principles apply.

## Section 8 – Maritime theatre missile deconfliction

5.8 Cruise missile flight paths that completely avoid amphibious airspace are difficult to implement due to geographic, legal, or political constraints. Amphibious forces may operate between ships launching cruise missiles and their intended targets. It is critical that the launch area coordinator (LAC) works closely with the appropriate tactical air control centre to ensure airspace is designed to allow amphibious flight operations to continue during cruise missile launches. It is particularly important that aircraft can operate through the airspace as needed.

5.9 For cruise missile launches solely in a maritime area (AOA, FACA), the LAC should provide the MCC, CATF or strike group commander specific cruise missile flight parameters such as affected airspace entry points, flight corridors and altitudes, timing, and target locations, and notify the ACA if the missiles routes are outside the AOA/FACA. In the LAC intentions message, cruise missile firing units should be advised of the composition of the affected airspace and deconfliction actions necessary for the airspace. When possible, the LAC should station firing units to minimize cruise missile flight paths through the maritime area airspace. If cruise missile targets are located within the AOA, the LAC and CATF or strike group commander should inform the cruise missile strike coordinator of any deconfliction issues and provide notice to ships affected by cruise missile flight paths.

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# Chapter 6 – Integration of air traffic services

## Section 1 – Air traffic control in the airspace control system

6.1 The role of airfield operations, which includes both air traffic control (ATC) and airfield management is to support flight operations. Close coordination between airspace control, air and missile defence, and ATC agencies is required to maximize combat effectiveness while preventing friendly fire and hazardous interference. The joint force may have forces available that can provide ATC and airfield management in support of both enroute and terminal flight operations, if not forces should be requested. These forces are designed to ensure safe, flexible, and efficient use of both the assigned airspace. They also provide continuity of control with airspace control agencies and airbase defence units. Airfield operations packages can be adapted to small unit and/or single-mission deployments. ATC and airfield management personnel may deploy and support operations at bare-base or host-nation locations. For Allied operations beyond the area of responsibility (AOR) or joint operations area (JOA), integration of military ATC requirements with host-nation air traffic system area and procedures should be coordinated. In all cases, the airspace control authority (ACA) coordinates and plans for appropriate follow-on airfield operations forces. Additional considerations include:

a. **Flight following mechanisms**. Normally an automated flight planning system is used to assist air traffic controllers in maintaining positive and procedural control of both en route and terminal areas.

b. **Procedural control versus positive control.** Environmental and equipment factors may preclude positive radar control of all air traffic. Because of this potential constraint, appropriate procedural means should be available, well understood and practiced.

c. **Airfield management.** Airfield management provides notices to air missions (NOTAM) and flight planning. They also provide airfield criteria for inspections, markings, safety, security, movement areas, parking plans, munitions, crash rescue, and hot fuel areas.

d. **Airfield Operations.** Airfield operations will coordinate, integrate, standardize, and regulate the ATS and airfield management assets provided by each of the components to increase operational effectiveness. The ACA will coordinate and plan appropriate follow-on, general-purpose ATS forces.

## Section 2 – Planning

6.2 Commanders determine the forces required, arrival sequence, and what level of risk they are willing to accept for airfield operations forces. Deployed airfield operations forces should be self-supporting during early stages of an operation as logistics system may not yet

be in place. Initial airfield operations should plan to deploy with adequate capability and supplies to maintain operations until the theatre is capable of sustaining operations and resupply channels are established.

## Section 3 – Capabilities

6.3 Airfield operation forces provide terminal area and airfield support from austere to fully supported host-nation airfields with mobile control towers, surveillance radars, precision-landing systems, terminal navigational aids, and other required capabilities. Special tactics teams can support austere autonomous airfield operations. General-purpose air traffic controllers can provide an initial bare-base ATC capability, but generally are not capable of autonomous operations and require additional support.

## Section 4 – Safety and standardization

6.4 To enhance safety, International Civil Aviation Organization (ICAO) rules and procedures should be used. Terminal airspace control follows procedures published in the airspace control plan and amplified by the airspace control order (ACO), air tasking order (ATO) and special instructions (SPINS). If military air traffic services (ATS) are provided at a civilian airfield used by civilian flights, established military procedures and relevant publications (e.g., releasable parts of the ACO and ATO/SPINS) should be made available to civil airspace users. Revised criteria and procedures should be authorized by the ACA in accordance with the commander joint force command's acceptable level of risk. When NATO forces augment a civil or foreign ATC facility, host-nation legislation, regulations, and procedures should be observed.

6.5 If established, coordination with the regional air movement coordination centre (RAMCC) should also be accomplished. The RAMCC manages interactions with aircraft not assigned or attached to the joint force as well as civil aircraft accessing and/or transiting the AOR or JOA. It also provides the air and missile defence commander with visibility of non-military air traffic not appearing on the ATO. The RAMCC coordinates operational requirements with ICAO and disseminates airspace and airfield information to all airspace users. The RAMCC may include liaison officers from coalition or neutral nations and maintains contact with non-governmental organizations and civil airspace users.

# Annex A – Airspace control plan

A.1 Every airspace control plan (ACP) is unique and should be based on the requirements and intentions of the commander joint force command's (COM JFC's) campaign or operation plan (OPLAN) and objectives. The ACP should consider the capabilities, limitations, restrictions of friendly and adversary forces and required access to the airspace by neutral aircraft. Airspace control changes throughout an operation, therefore the ACP changes accordingly. Consider the following while developing the ACP.

a. The conditions under which the orders, instructions, guidance, and procedures in the ACP are applicable, e.g., the OPLAN, work-up training, or exercises.

b. The boundaries of the ACAR within which the ACP applies.

c. Designation of the airspace control authority (ACA) and the location of the ACA's headquarters.

d. Statement of COM JFC's acceptable level of airspace control risk for all airspace users.

e. Airspace control capabilities in the ACAR and the communication means amongst them. Locations of airspace control agencies, sensor and beacon sites, and training areas. Communications and capabilities of all airspace users.

f. Duties and responsibilities of:

(1) The ACA.

(2) The joint airspace coordination centre.

(3) Sub-area airspace control authorities, if established.

(4) Each airspace control element within the airspace control system.

(5) Each airspace user.

(6) Requirements for liaison and coordination with the ACA.

g. Command and control (C2) arrangements between the ACA, air and missile defence commander, commander joint force air component, other component commands, and fire support agencies, along with the procedures for coordinating and integrating and deconflicting air and missile defence (AMD), direct and indirect surface fires, and other operational requirements.

h. C2 arrangements with the host nation, AMD agencies, airspace control, and air traffic control systems (military and civil) and/or international and non-governmental organizations as required.

i. C2 arrangements between NATO and non-NATO forces for de-confliction and coordination of airspace requirements.

j. Plans to provide for airspace control operations under degraded conditions, e.g., alternate headquarters and C2 nodes, alternate surveillance and communications sites.

k. Positive and procedural airspace control methods for all elements of the joint force. These include but are not limited to:

(1) Control of high-density airspace control zones and restricted operating zones (ROZs).

(2) Pre-planned/on-order ROZs and kill boxes.

(3) Procedures for entering/transiting/departing ROZs.

(4) Relative priority of coordination measures (CMs), e.g., transit route vs ROZ.

(5) Location of active patrol areas.

(6) Active weapons free zones (WFZs).

(7) Procedures for activating unmanned aircraft airspace.

(8) Delineation of coordination procedures and airspace control element responsibility for the coordination level.

(9) Procedures for transitioning between positive and procedural airspace control.

l. Procedures to propose, approve, promulgate and modify procedural CMs.

m. Identification, friend or foe (IFF)/selective identification feature (SIF) and any other combat identification procedures.

n. Procedures and systems used to compile and promulgate the airspace control order (ACO).[24] The ACO should normally contain:

[24] See APP-11, *NATO Message Catalogue,* for ACO message details.

(1) Modifications to any of the ACP guidance and/or procedures.

(2) Activation or changes to IFF/SIF procedures.

(3) Activation or changes to positive control of CMs.

(4) Activation or changes to procedural control of CMs.

(5) Procedures for entering and transiting ROZs and other CMs.

(6) The location of active patrol areas.

(7) Activation times for WFZs and unmanned aircraft operating areas.

o. Emissions control procedures, electromagnetic interference resolution guidance.

p. Identify common airspace control terms for all airspace users.

q. All conventions used in the ACP, e.g., navigation/geographic referencing, to include the use of latitude/longitude, world geographic reference system, and universal transverse Mercator. Designate height reference and pressure datums used, and explain pressure variation buffers, as required.

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# Annex B – Coordination measures

B.1. This annex provides a description of coordination measures (CM) used in joint operations. CMs are employed to facilitate the efficient use of airspace for offensive and defensive operations, support surface forces manoeuvre and provide air traffic control (ATC) while simultaneously providing safeguards for friendly forces. CMs are approved through appropriate command channels and promulgated via the airspace control order (ACO). CMs are categorized as airspace control means, fire support coordination measures, manoeuvre control measures, air reference measures, air defence measures, maritime defence measures, and air traffic control measures. The annex also includes relevant airspace control-related terms from the ACO message text format in Allied Procedural Publication (APP)-11, *NATO Message Cataloque*. The CM categories are further described below.

B.2. Airspace user transit of CMs requires coordination with the owning/controlling authority for the measure. Coordination can occur during planning or directly via voice/data communications. Unplanned and unannounced transit of these measures, whether by aircraft or fires, may result in friendly fire.

B.3. If the CMs listed in this annex do not satisfy operational requirements, this document does not limit the airspace control authority (ACA) in specifying geographical areas and their usage as necessary for promulgation in the airspace control plan and ACO. CMs are published in the ACO.

## Coordination measure categories

**Airspace control means (ACM).** A measure employed to facilitate the efficient use of airspace to accomplish missions and simultaneously provide safeguards for friendly forces.

**Fire support coordination measure (FSCM).** A measure employed by land and amphibious commanders to facilitate the rapid engagement of targets and to provide safeguards for friendly forces.

**Manoeuvre control measure (MCM).** A measure established by commanders on the surface to define lines of responsibility in support of movement and manoeuvre of friendly forces.

**Air reference measure (ARM).** A measure used for command and control purposes that defines a point over the ground or a volume of airspace. ARMs do not require coordination to pass over or through them.

**Air defence measure (ADM).** A measure planned, coordinated, and employed to facilitate responsibilities for identification, detection, and tracking to engage enemy air and missile threats as directed by the air and missile defence commander.

**Maritime defence measure (MDM).** A measure planned, coordinated, and employed by the maritime commander to facilitate maritime offensive and defensive actions.

**Air traffic control measure (ATCM).** A measure established by civil or military ATC for the purpose of expeditious and safe movements of aircraft. ATCMs are directive and restrictive and are established in conjunction with civil and military airspace control and ATC authorities, and the International Civil Aviation Organization, as appropriate.

## Most often used coordination measures[25]

**Air route (AIRRTE).** AIRRTEs are navigable airspace between two points, identified to the extent necessary for the application of flight rules. They are bi-directional and can direct aircraft through air defences, where appropriate, providing minimum risk passage. AIRRTEs will be utilized only by support traffic. AIRRTE is an ACM.

**Altitude reservation (ALTRV).** An ALTRV is a block altitude reserved for aircraft to transit or loiter for mission accomplishment. An ALTRV can be classified as a moving or stationary. Typical missions requiring assignment of an ALTRV may include air-to-air refuelling, airborne early warning, intelligence collection, electromagnetic counter measure, or aerial spotting. An ALTRV may have lateral limits as well as mandatory upper and lower limits. ALTRV is an ATCM.

**Approach corridor (APPCOR).** An APPCOR is established for the safe passage of land-based aircraft joining or departing a maritime force. The approach corridor is usually established on a line between entry/exit gate, and either the force disposition centre or along the position and intended movement of the force. The inner boundary is determined by the identification safety range (ISR). APPCOR is an MDM.

**Base defence zone (BDZ).** Airspace established around a base to enhance the effectiveness of air defence systems. BDZ is an ADM.

**Coordination level (CL).** An altitude or height used to establish airspace control responsibilities primarily to deconflict airspace users. CL is an ACM.

**Crossover zone (COZ).** In maritime operations, the COZ is the airspace beyond the missile engagement zone (MEZ) which may be entered by air and missile defence (AMD) aircraft when in hot pursuit to complete an interception. The aircraft must give a countdown of seconds remaining to achieve engagement. COZ is an MDM.

**Entry/exit gate (EG).** An EG is the point to which an aircraft will be directed to commence the transit inbound/outbound from an airfield or force at sea. EG is an ARM.

[25] For more CM details, see ATP-3.3.5.1 *Joint Airspace Control Tactics, Techniques and Procedures*.

**Fighter engagement zone (FEZ).** FEZ is an ADM.

**Force air coordination area (FACA).** In maritime usage, an area surrounding a force within which airspace control and AMD measures are required to prevent mutual interference between all friendly surface and air units and their weapon systems. FACA is an ACM.

**Forward area.** The coverage area of all forward deployed surface-based air and missile defence (SBAMD) weapon systems. The forward and rear boundaries will be published in the ACO.[26]

**Hand-over gate (HG).** An HG is the point at which the control of the aircraft, if radar hand-over is used, changes from one controller to another. HG is an ATCM.

**High-density airspace control zone (HIDACZ).** Airspace of defined dimensions, designated by the ACA, in which there is a concentrated employment of numerous and varied weapons and airspace users. HIDACZ is an ACM.

**Identification, friend or foe switch line (IFFOFF). Identification, friend or foe switch on line (IFFON).** IFFOFF and IFFON phase lines are to be established and will be published in the ACO. Phase lines specified in the airspace control order where aircraft turn off the IFF transponder en route to the target and turn on the transponder after completing the mission. IFFOFF and IFFON are ARMs.

**Identification safety range.** The minimum range to which aircraft may close to a maritime force without having been positively identified as friendly to ensure that the maritime force does not mistake the aircraft for hostile. The ISR is promulgated by the officer in tactical command (OTC) in the operation order or appropriate tactical message. ISR is an MDM.

**Joint engagement zone (JEZ).** In AMD, that airspace of defined dimensions within which multiple air defence systems (surface-to-air missiles and aircraft) are simultaneously deployed to engage air threats. The limits are defined in the operational tasking anti-air warfare (OPTASK AAW).

**Marshalling gate (MG).** MG is the point to which aircraft fly for air traffic control purposes prior to commencing an outbound transit after takeoff or prior to landing. MG is an ATCM.

**Missile arc (MISARC).** MISARC is an ADM. In maritime usage, an area of 10 degrees or as large as ordered by the OTC, centred on the bearing of the target with a range that extends to the maximum range of the surface-air missile.

[26] While not a CM, forward area is included here for clarity as it is published in the ACO and used in the descriptions of several CMs.

**Missile engagement zone.** In air and missile defence, airspace of defined dimensions that is normally reserved for engagements by surface-to-air missile weapon systems. MEZ is an ADM.

**Restricted operating zone (ROZ).** Airspace of defined dimensions, designated by the ACA in response to specific situations and/or requirements, within which the operation of one or more airspace users is restricted. Examples of ROZs include refuelling orbits, terminal approach holding areas, fires, landing/drop zones, etc. ROZ is an ACM.

**Safe lane (SL).** A bi-directional lane connecting an airbase, landing site, and/or BDZ to adjacent routes/corridors. SLs may also be used to connect adjacent activated routes/corridors. SL is an ADM.

**Safety sector (SAFES).** A SAFES is an established sector in which aircraft are safe from attack by friendly fighter or weapons to allow aircraft to approach or return to the maritime force. SAFES is an MDM.

**Ship control zone (SCZ).** An SCZ is an area activated around a ship operating aircraft, which is not to be entered by friendly aircraft without permission, to prevent friendly interference. SCZ is an MDM.

**Slow aviation assets flight route (SAAFR).** SAAFRs are established to route land component aviation assets in the forward area in direct support of ground operations. SAAFR is an ACM.

**Special corridor (SC).** In air operations, an air corridor established to accommodate the special routing requirements of specific missions. SC is an ACM.

**Temporary minimum-risk route (TMRR).** A temporary route of defined dimensions established to route air traffic between transit routes (TRs) or the rear boundary of the forward area and their operations area in direct support of ground operations. TMRR is an ACM.

**Time slot (TS).** Period during which certain activities are governed by specific regulations. During the period indicated by the TS, certain airspace activities within the associated airspace are restrained to permit other users' greater freedom of operation. At the end of this period, the restraint is automatically cancelled.

**Transit corridor (TC).** TCs are bi-directional corridors established in the rear area to route aircraft through air defences with minimum risk. TC is an ACM.

**Transit Route.** In air operations, a temporary air corridor of defined dimensions established in the forward area to minimize the risks to friendly aircraft from friendly air defences or surface forces. TRs are bi-directional routes and should avoid weapons free zones and BDZs. TR is an ACM.

**Traverse level (TL).** That vertical displacement above low-level AMD systems, expressed both as height and altitude, at which aircraft can cross the area. TLs are promulgated to improve the effectiveness of the AMD systems by providing an additional friendly discriminator. TL is an ADM.

**Weapon engagement zone (WEZ).** In air and missile defence, airspace of defined dimensions that is normally reserved for engagements by a specific weapon system**.**

**Weapons free zone (WFZ).** An AMD zone established around key assets or facilities, other than airbases, which merit special protection by SBAMD assets where weapons may be fired at any target not positively identified as friendly. WFZ is an ADM.

# Coordination measures summary

## Table B-1

| Airspace control means (ACM) | | |
|---|---|---|
| **Measure** | **(Abbreviation)** | **Definition/Description** |
| Air Route | AIRRTE | The navigable airspace between two points, identified to the extent necessary for the application of flight rules. |
| Air-to-Air Refuelling Area | AARA | Airspace of defined dimensions set aside for air-to-air refuelling operations. |
| Airborne Command and Control Area | ACCA | Airspace of defined dimensions established specifically for aircraft conducting battlefield command and control. |
| Airborne Early Warning Area | AEWA | Airspace of defined dimensions established specifically for aircraft conducting early warning. |
| Airspace Control Area | ACAR | Airspace which is laterally defined by the boundaries of the area of operations. The airspace control area may be subdivided into airspace control sub-areas. |
| Control Area | CTA | A controlled airspace extending upwards from a specified limit above the earth. |
| Coordination Level | CL | An altitude or height used to establish airspace control responsibilities primarily to deconflict airspace users. |
| Cross Border Area | CBA | A temporary segregated area established over international boundaries for specific operational requirements. |

| | | |
|---|---|---|
| Drop Zone | DZ | A specified area upon which airborne troops, equipment, or supplies are airdropped. |
| Electromagnetic Combat | EC | Airspace established specifically for aircraft engaging in electromagnetic combat. |
| Force Air Coordination Area | FACA | In maritime usage, an area surrounding a force within which airspace control and air defence measures are required to prevent mutual interference between all friendly surface and air units and their weapon systems. |
| High-Density Airspace Control Zone | HIDACZ | Airspace of defined dimensions, designated by the airspace control authority, in which there is a concentrated employment of numerous and varied weapons and airspace users. |
| Landing Zone | LZ | Any specified zone used for the landing of aircraft. |
| Low-Level Transit Route | LLTR | A temporary corridor of defined dimensions established in the forward area to minimize risk to friendly aircraft from friendly air defences or surface forces. |
| No-Fly Zone | NFZ | A zone of airspace of defined dimensions set aside for specific purposes in which no aircraft operations are permitted, except those authorized by the enforcing authority. |
| Pickup Zone | PZ | Aerial retrieval area. |
| Reconnaissance Area | RECCE | Airspace established specifically for aircraft conducting reconnaissance. |

| | | |
|---|---|---|
| Restricted Operating Zone | ROZ | Airspace of defined dimensions, designated by the airspace control authority in response to specific situations and/or requirements, within which the operation of one or more airspace users is restricted. |
| Slow Aviation Assets Flight Route | SAAFR | Route established below the coordination level to facilitate movement of land component aviation assets in the forward area in direct support of ground operations. |
| Special Corridor | SC | In air operations, an air corridor established to accommodate the special routing requirements of specific missions. |
| Surface-to-Surface Missile System | SSMS | Airspace defined specifically for Army Tactical Missile System and surface-launched cruise missile launch and impact points. |
| Temporary Minimum-Risk Route | TMRR | A temporary route established to route air traffic between transit routes or the rear boundary of the forward area and their operations area in direct support of ground operations. |
| Temporary Reserved Area | TRA | A defined volume of airspace normally under the control of one airspace authority and temporarily reserved, by common agreement, for the specific use by another airspace authority and through which air traffic may be allowed to transit, under air traffic control clearance. |
| Temporary Segregated Area | TSA | An airspace of defined dimensions within which activities require the reservation of airspace for the exclusive use of specific users during |

| | | |
|---|---|---|
| | | a determined period. |
| Training Area | TRNG | A geographical area, which may include airspace, temporarily or permanently designated for education and training purposes, including exercises and testing activities. |
| Transit Corridor | TC | A corridor established in the rear area to route aircraft through air defences with minimum risk. Air traffic services are not normally provided. |
| Transit Route | TR | In air operations, a temporary air corridor of defined dimensions established in the forward area to minimize the risks to friendly aircraft from friendly air defences or surface forces. |
| Unmanned Aircraft Area | UAA | Airspace of defined dimensions created specifically for unmanned aircraft operations. |

## Table B-2

| | Fire support coordination | measures (FSCM)[27] |
|---|---|---|
| **Measure** | **Abbreviation** | **Definition/Description** |
| Coordinated Fire Line | CFL | A line beyond which conventional, indirect, surface fire support means may fire at any time within the boundaries of the establishing headquarters without additional co-ordination. |
| Fire Support Coordination Line | FSCL | Within an assigned area of operations, a line established by a land or amphibious force commander to denote coordination requirements for fires by other force elements which may affect the commander's current and planned operations. The establishment of the fire support coordination line must be coordinated with the appropriate commanders and supporting elements. |
| Kill Box | KB | A three-dimensional reference system that enables timely, effective coordination and control and facilitates rapid attacks to be conducted within the bounds of law of armed conflict and rules of engagement. For dynamic targeting operations, a KB is a permissive FSCM that maximises the effects of airpower by reducing coordination requirements.[28] |

[27] For a complete listing of FSCMs, see AArtyP-05, *NATO Fire Support Doctrine*.

[28] See ATP-3.3.5.1, *Joint Airspace Control Tactics, Techniques and Procedures*

## Table B-3

| | Manoeuvre control | measures (MCM) |
|---|---|---|
| **Measure** | **Abbreviation** | **Definition/Description** |
| Amphibious Objective Area | AOA | A geographical area, delineated in the initiating Objective Area directive, for purposes of command and control within which is located the objective(s) to be secured by the amphibious task force. |
| Forward Edge of the Battle Area | FEBA | The foremost limits of a series of areas in which ground combat units are deployed, excluding the areas in which the covering or screening forces are operating, designated to coordinate fire support, the positioning of forces, or the manoeuvre of units. |
| Forward Line of Own Troops | FLOT | A line which indicates the most forward positions of friendly forces in any kind of military operation at a specific time. |

## Table B-4

| Air reference measures (ARM) | | |
|---|---|---|
| **Measure** | **Abbreviation** | **Definition/Description** |
| Air Control Point | ACP | A point that is defined and used for navigation, command and control, and communication. |
| Buffer Zone | BZ | Airspace designed specifically to provide a buffer between various coordination measures. |
| Contact Point | CP | In air operations, the position at which a mission leader makes radio contact with an airspace control agency. |
| Entry/Exit Gate | EG | The point to which an aircraft will be directed to commence the transit inbound/outbound from an airfield or force at sea. |
| IFF Switch Off Line | IFFOFF | The line demarking where friendly aircraft stop emitting an identification, friend or foe signal. |
| IFF Switch On Line | IFFON | The line demarking where friendly aircraft start emitting an identification, friend or foe signal. |

## Table B-5

| Air defence measures (ADMs) | | |
|---|---|---|
| **Measure** | **Abbreviation** | **Definition/Description** |
| Air Defence Identification Zone | ADIZ | Airspace of defined dimensions within which the ready identification, location, and control of aircraft is required. |
| Base Defence Zone | BDZ | Airspace established around a base to enhance the effectiveness of air defence systems. |
| Control Zone | CTZ | A controlled airspace extending upwards from the surface of the Earth to a specified upper limit. |
| Coordinated Air Defence Area | CADA | A mutually defined block of airspace between a land-based air commander and a naval commander when their forces are operating in close proximity to one another. |
| Fighter Engagement Zone | FEZ | In air defence, that airspace of defined dimensions within which the responsibility for engagement of air threats normally rests with fighter aircraft. |
| Missile Arc | MISARC | In maritime usage, a n area of 10 degrees or as large as ordered by the officer in tactical command, centred on the bearing of the target with a range that extends to the maximum range of the surface-to-air missile. |
| Safe Lane | SL | A bi-directional lane connecting an airbase, landing site, and/or base defence zone to adjacent routes/corridors. Safe lanes may also be used to connect adjacent |

| | | |
|---|---|---|
| | | activated routes/corridors. |
| Surface-to-air missile engagement zone | SAMEZ | In air and missile defence, airspace of defined dimensions that is normally reserved for engagements by surface-to-air missile systems. |
| Traverse Level | TL | That vertical displacement above low-level air defence systems, expressed both as a height and an altitude, at which aircraft can cross the area. |
| Weapons Free Zone | WFZ | An air defence zone established for the protection of key assets or facilities, other than airbases, where air defence weapons systems may be fired at any target not positively identified as friendly. |

## Table B-6

| Maritime defence measures (MDM) | | |
|---|---|---|
| **Measure** | **Abbreviation** | **Definition/Description** |
| Approach Corridor | APPCOR | Airspace established for the safe passage of land-based aircraft joining or departing a maritime force. |
| Carrier Control Zone | CCZONE | An area around an aircraft carrier operating fixed-/ rotary-wing aircraft. |
| Crossover Zone | COZ | Airspace beyond the missile engagement zone into which fighters may pursue targets to complete interception. |
| Identification Safety Point | ISP | A point at which aircraft, on joining a maritime force, will attempt to establish two-way communications with the surface force and commence identification procedures. |
| Identification Safety Range | ISR | The minimum range to which aircraft may close to a maritime force without having been positively identified as friendly to ensure that the maritime force does not mistake the aircraft for hostile. |
| Safety Sector | SAFES | Established to route friendly aircraft to maritime forces with minimum risk. |
| Ship Control Zone | SCZ | An area activated around a ship operating aircraft, which is not to be entered by friendly aircraft without permission, to prevent friendly interference. |

## Table B-7

| Air traffic control measures (ATCM) | | |
|---|---|---|
| **Measure** | **Abbreviation** | **Definition/Description** |
| Advisory Route | ADVRTE | A designated route along which air traffic advisory service is available. |
| Airway | ARWY | A control area or portion thereof established in the form of a corridor marked with radio navigational aids. |
| Altitude Reservation | ALTRV | A block of altitude reserved for aircraft to transit or loiter. |
| Area Navigation Route | NAVRTE | An air traffic services route established for the use of aircraft capable of employing area navigation. |
| ATS Route | ATSRTE | A specified route designed for channelling the flow of traffic as necessary for the provision of air traffic services. |
| Class-A Airspace | CLSA | Airspace in which only instrument flight rule (IFR) flights are permitted; all flights are subject to air traffic control service and are separated from each other. |
| Class-B Airspace | CLSB | Airspace in which IFR and visual flight rule (VFR) flights are permitted; all flights are subject to air traffic control service and are separated from each other. |
| Class-C Airspace | CLSC | Airspace in which IFR and VFR flights are permitted; all flights are subject to air traffic control service and IFR flights are separated from other IFR flights and from VFR flights. VFR flights are separated from IFR flights and receive traffic |

| | | |
|---|---|---|
| | | information with respect to other VFR flights. |
| Class-D Airspace | CLSD | Airspace in which IFR and VFR flights are permitted; all flights are subject to air traffic control service and IFR flights are separated from other IFR flights and receive traffic information with respect to VFR flights. VFR flights receive traffic information with respect to all other flights. |
| Class-E Airspace | CLSE | IFR flights and VFR flights are permitted; all flights are subject to air traffic control service and are separated from other IFR flights. All flights receive traffic information as far as practical. |
| Class-F Airspace | CLSF | Airspace in which IFR and VFR flights are permitted; all participating IFR flights receive an air traffic advisory service and all flights receive flight information service if requested. |
| Class-G Airspace | CLSG | Airspace in which IFR and VFR flights are permitted; all flights receive flight information service if requested. |
| Conditional Route | CDR | A non-permanent air traffic service route or portion thereof that can be planned and used only under certain conditions. |
| Danger Area | DA | In air traffic control, an airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times. |

| | | |
|---|---|---|
| Flight Information Region | FIR | An airspace of defined dimensions within which flight information service and alerting service are provided. |
| Hand-over Gate | HG | The point at which the control of the aircraft, if radar hand-over is used, changes from one controller to another. |
| Marshalling Gate | MG | A point to which aircraft fly for air traffic control purposes prior to commencing an outbound transit after takeoff or prior to landing. |
| Prohibited Area | PROHIB | An airspace of defined dimensions, above the land areas or territorial waters of a state within which the flight of aircraft is prohibited. |
| Reduced Coordination | RCA | Airspace of defined dimensions within which general air traffic is permitted off-route without requiring general air traffic controllers to initiate coordination with operational air traffic controllers. |
| Restricted Area | RA | An airspace of defined dimensions, above the land areas or territorial waters of a state, within which the flight of aircraft is restricted in accordance with certain specified conditions. |
| Terminal Control Area | TCA | A control area normally established at the confluence of air traffic services routes in the vicinity of one or more major aerodromes. |

# Annex C – Airspace control means request message format

The following pages provide details of the format for the airspace control means request (ACMREQ) message per APP-11, *NATO Message Catalogue.*[29]

## Airspace Control Means Request

**Message identifier (Name):** ACMREQ (AIRSPACE CONTROL MEANS REQUEST)

**Related Documents:** AJP-3.3.5

**Purpose:** The ACMREQ is used to request a specific airspace control means in a specified future airspace control order.

**Sponsor:** NSO (AIR) AIR OPERATIONS WORKING GROUP (AOWG)

**Notes:** none

**Status:** Published

[29] Differences between the NATO ACMREQ version and the United States Message Text Format (USMTF) version may create interoperability issues.

| Seg | Alt | Rpt | Occ | SETID | Seq | Set Format Name | Description |
|---|---|---|---|---|---|---|---|
| | 1# | | O | EXER | 1 | EXERCISE IDENTIFICATION | Provides the Exercise name. Identifies the Exercise the message pertains to. Not to be used in conjunction with set OPER. |
| | 1# | | O | OPER | 2 | OPERATION CODEWORD | Provides the Operation codeword. Identifies the Operation the message pertains to. Not to be used in conjunction with set EXER. |
| | | | M | MSGID | 3 | MESSAGE IDENTIFIER | Specifies the message identifier, message originator and other message identifying details. |
| **FIELD** | **1** | **IN** | **SET** | **3 (MSGID)** | **IS ASSIGNED** | **THE VALUE "ACMREQ".** | |
| | | √ | O | REF | 4 | REFERENCE | Specifies identifying details regarding a document, image or other information exchange media that is applicable to the content of this message. |
| | | | M | POC | 5 | POINT OF CONTACT INFO | Provides point of contact information at the unit requesting airspace. |
| | | | O | ACMSTAT | 6 | AIRSPACE CONTROL MEANS STATUS | Indicates a deletion of, or a change to, an airspace control means or associated attribute, e.g., shape, use, etc. |

**[1.1] Start of CONDITIONAL Segment ACM DESCRIPTION SEGMENT which MAY be repeated unlimited times.**
Provides details on requested airspace control means.
The Sets ACMID to GENTEXT (TRANSIT INSTRUCTIONS) form a segment.
May only be used in conjunction with ACM status "CHANGE" or "ADD".

**KEY:** √ = Repeatability, M= Mandatory, C= Conditional, O= Operationally Determined
Set/Segment ALT: #= only 1 of the alternatives MAY be selected. Alt with no symbol= only 1 of the alternatives MUST be selected

| Seg | Alt | Rpt | Occ | SETID | Seq | Set Format Name | Description |
|---|---|---|---|---|---|---|---|
| 1.1 | | | M | ACMID | 7 | AIRSPACE CONTROL MEANS IDENTIFICATION | Identifies the requested Airspace Control Means (ACM). |
| 1.1 | | | M | GEODATIM | 8 | GEODETIC DATUM | GEODETIC DATUM Provides geodetic datum reference for geographic locations in the ACM. |
| 1.1 | | | O | POLYARC | 9 | AIRSPACE SHAPE POLYARC | Defines a polygon and arc shaped airspace. |
| 1.1 | | | O | RADARC | 10 | AIRSPACE SHAPE RADARC | Defines a radial and arc shaped airspace. |
| 1.1 | | | O | AIRTRACK | 11 | AIRSPACE SHAPE TRACK | Defines a track shaped airspace. |
| 1.1 | | | O | POLYGON | 12 | SHAPE POLYGON | Defines a polygon shaped airspace. |
| 1.1 | | | O | CIRCLE | 13 | SHAPE CIRCLE | Defines a circular shaped airspace. |
| 1.1 | | | O | CORRIDOR | 14 | AIRSPACE SHAPE CORRIDOR | Defines an airspace that is shaped like a corridor. |
| 1.1 | | | O | APOINT | 15 | SHAPE POINT | Defines an airspace that is a single point. |
| 1.1 | | | O | AORBIT | 16 | AIRSPACE SHAPE ORBIT | Defines an airspace that is an orbit. |
| 1.1 | | | O | GEOLINE | 17 | GEOMETRIC COMPOSITE LINE | Defines an airspace that is a single line. |
| 1.1 | | | C | EFFLEVEL | 18 | VERTICAL DIMENSION OF THE EFFECTIVE LEVEL | Specifies the vertical dimension of the airspace, using one of the different methods of identifying vertical distance (e.g., FL, AGL, AMSL, GL, MSL), for all airspace shapes except tracks. |
| 1.1 | | | O | APERIOD | 19 | AIRSPACE TIME PERIOD | Specifies the effective date-time of the requested airspace control means. |
| 1.1 | | | O | CNTRLPT | 20 | CONTROL POINT | Describes the reference/controlling/rendezvous point for a requested airspace control means. |
| 1.1 | | | O | CONTAUTH | 21 | CONTROLLING AUTHORITY | Identifies the agency that will control an ACM or group of ACMs identified in its associated segment. |
| 1.1 | | | O | GENTEXT | 22 | PURPOSE | Specifies the purpose of the requested ACM. |
| **FIELD** | **1 IN** | **THIS** | **SET** | **IS ASSIGNED** | **THE** | **VALUE "PURPOSE".** | |
| 1.1 | | | O | GENTEXT | 23 | TRANSIT INSTRUCTIONS | Specifies the transit instructions. |
| **FIELD** | **1 IN** | **THIS** | **SET** | **IS ASSIGNED** | **THE** | **VALUE " TRANSIT** | **INSTRUCTIONS".** |

[1.1] End of ACM DESCRIPTION SEGMENT
**KEY:** √ = Repeatability, M= Mandatory, C= Conditional, O= Operationally Determined
Set/Segment ALT: #= only 1 of the alternatives MAY be selected. Alt with no symbol= only 1 of the alternatives MUST be selected

| Seg | Alt | Rpt | Occ | SETID | Seq | Set Format Name | Description |
|---|---|---|---|---|---|---|---|
| 1.1 | | | M | UNDLKTN | 24 | UNDEFINED AIRSPACE CONTROL MEANS LINK 16 TRACK NUMBER REFERENCE | Provides the LINK 16 reference track number which is used to disseminate new critical airspace control means identified (via ACO updates) during the day's operations/period of the ACO to LINK 16 users in real-time. |
| 1.1 | | | M | DECL | 25 | MESSAGE DOWNGRADING OR DECLASSIFICATION DATA | MESSAGE DOWNGRADING OR DECLASSIFICATION DATA |

**KEY**: √ = Repeatability, M= Mandatory, C= Conditional, O= Operationally Determined
Set/Segment ALT: #= only 1 of the alternatives MAY be selected. Alt with no symbol= only 1 of the alternatives MUST be selected

# Lexicon

## Part 1 – Acronyms and abbreviations

| | |
|---|---|
| AAW | anti-air warfare |
| AAWC | anti-air warfare commander |
| ACA | airspace control authority |
| ACAR | airspace control area |
| ACM | airspace control means |
| ACMREQ | airspace control means request |
| ACO | airspace control order |
| ACP | airspace control plan |
| ACS | airspace control system |
| ADM | air defence measure |
| AIRRTE | air route |
| AJP | Allied joint publication |
| ALTRV | altitude reservation |
| AMD | air and missile defence |
| AMDC | air and missile defence commander |
| AMDP | air and missile defence plan |
| AOA | amphibious objective area |
| AOC | air operations centre |
| AOR | area of responsibility |
| APP | Allied procedural publication |
| APPCOR | approach corridor |
| ARM | air reference measure |
| ASW | antisubmarine warfare |
| ATC | air traffic control |
| ATCM | air traffic control measure |
| ATO | air tasking order |
| ATP | Allied tactical publication |
| ATS | air traffic service |
| AWACS | airborne warning and control system |
| BDZ | base defence zone |
| CAOC | combined air operations centre |
| CASP | coordinated air/sea procedures |
| CATF | commander amphibious task force |
| C2 | command and control |
| CL | coordination level |
| CM | coordination measure |
| COM JFAC | joint force air component commander |
| COM JFC | commander joint force command |
| COZ | crossover zone |
| CRC | control and reporting centre |

| | |
|---|---|
| EG | entry/exit gate |
| FACA | force air coordination area |
| FEZ | fighter engagement zone |
| FSCM | fire support coordination measure |
| HG | hand-over gate |
| HIDACZ | high-density airspace control zone |
| HQ AIRCOM | Headquarters Allied Air Command |
| ICAO | International Civil Aviation Organization |
| ID | identification |
| IFF | identification, friend or foe |
| IFFON | identification, friend or foe switch on line |
| IFFOFF | identification, friend or foe switch off line |
| ISR | identification safety range |
| JACC | joint airspace coordination centre |
| JEZ | joint engagement zone |
| JFAC | joint force air component |
| JOA | joint operations area |
| KB | kill box |
| LAC | launch area coordinator |
| MCC | maritime component commander |
| MCM | manoeuvre control measure |
| MDM | maritime defence measure |
| MEZ | missile engagement zone |
| MG | marshalling gate |
| MISARC | missile arc |
| NA5CRO | non-Article 5 crisis response operation |
| NATO | North Atlantic Treaty Organization |
| OPCON | operational control |
| OPLAN | operation plan |
| OPTASK AAW | operational tasking anti-air warfare |
| OTC | officer in tactical command |
| RAMCC | regional air movement coordination centre |
| RAP | recognized air picture |
| ROE | rules of engagement |
| ROZ | restricted operating zone |
| SAAFR | slow-aviation assets flight route |
| SACA | sub-area airspace control authority |
| SAFES | safety sector |
| SAM | surface-to-air missile |
| SBAMD | surface-based air and missile defence |
| SC | special corridor |
| SCZ | ship control zone |
| SIF | selective identification feature |
| SL | safe lane |
| SPINS | special instructions |

| | |
|---|---|
| TACON | tactical control |
| TC | transit corridor |
| TES | theatre entry standard |
| TL | traverse level |
| TMRR | temporary minimum-risk route |
| TR | transit route |
| TS | time slot |
| UA | unmanned aircraft |
| WEZ | weapon engagement zone |
| WFZ | weapons free zone |

## Part 2 – Terms and definitions

**air and missile defence (AMD)**
All measures designed to nullify or reduce the effectiveness of hostile air action.
(NATO Agreed)

**air traffic control measure (ATCM)**
A measure established by civil or military air traffic control for the purpose of expeditious and safe movements of aircraft.
(This term and definition only applies to this publication).

**airspace control (AC)**
The implementation and coordination of the procedures governing airspace planning and organization in order to minimize risk and allow for the efficient and flexible use of airspace.
(NATO Agreed)

**airspace control area (ACAR)**
Airspace which is laterally defined by the boundaries of the area of operations. The airspace control area may be subdivided into airspace control sub-areas.
(NATO Agreed)

**airspace control authority (ACA)**
The commander designated to assume overall responsibility for the operation of the airspace control system of assigned area.
(NATO Agreed)

**airspace control means (ACM)**
A measure employed to facilitate the efficient use of airspace to accomplish missions and simultaneously provide safeguards for friendly forces.
(This term and definition only applies to this publication)

**airspace control order (ACO)**
An order implementing the airspace control plan published either as part of the air tasking order or as a separate document.
(This term and definition only applies to this publication)

**airspace control plan (ACP)**
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.
(This term and definition only applies to this publication)

**airspace control system (ACS)**
An arrangement of those organizations, personnel, policies, procedures and facilities required to perform airspace control functions.
(NATO Agreed)

**command and control (C2)**
The authority, responsibilities and activities of military commanders in the direction and coordination of military forces as well as the implementation of orders related to the execution of operations.
(NATO Agreed)

**coordination measure (CM)**
A measure employed to facilitate the efficient use of airspace for offensive and defensive operations, support surface forces manoeuvre and provide air traffic control while simultaneously providing safeguards for friendly forces.
(This term and definition only applies to this publication)

**joint engagement zone (JEZ)**
In air defence, that airspace of defined dimensions within which multiple air defence systems (surface-to-air missiles and aircraft) are simultaneously employed to engage air threats.
(NATO Agreed)

**rules of engagement (ROE)**
Directives to military forces, including individuals, that define the circumstances, conditions, degree, and manner in which force, or actions which might be construed as provocative, may be applied.
(NATO Agreed)

**tactical control (TACON)**
The detailed and, usually, local direction and control of movements or manoeuvres necessary to accomplish missions or tasks assigned.
(NATO Agreed)

**weapon control status (WCS)**
The degree of freedom granted to a designated weapon system to engage targets in a given environment.
(NATO Agreed)

# AJP-3.3.5(C)(1)

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