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Edition C Version 1

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ALLIED JOINT DOCTRINE FOR AIR AND SPACE OPERATIONS

Edition C, Version 1

FEBRUARY 2026

NORTH ATLANTIC TREATY ORGANIZATION

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NATO LETTER OF PROMULGATION

11 February 2026

1. The enclosed Allied Joint Publication AJP-3.3, Edition C, Version 1, ALLIED JOINT DOCTRINE FOR AIR AND SPACE OPERATIONS, which has been approved by the nations in the MILITARY COMMITTEE JOINT STANDARDIZATION BOARD (MCJSB), is promulgated herewith. The agreement of nations to use this publication is recorded in STANAG 3700.

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Allied Joint Publication-3.3

Allied Joint Doctrine for Air and Space Operations

Allied Joint Publication-3.3 (AJP-3.3), Edition C, Version 1,

dated February 2026,

is promulgated as directed by the Chiefs of Staff

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RECORD OF NATIONAL RESERVATIONS

CHAPTER	RECORD OF RESERVATION BY NATIONS
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

FRA	The provisions outlined in annex B – B7: “In case of nuclear operations, dual capable aircraft are to be tasked directly by SACEUR” will not be adopted for implementation.
HRV	National military components are not in accordance with NATO structure (AOC - Air Operations Centre, ASOC- Air Support Operations Centre, C2 - Command and Control network, SBAD – Surface Based Air Defense.) Lack of Air Missile Defense - AMD capabilities & coordination with airspace control.
SWE	Chapter 1, Section 5, 1.12 a. and b. Sweden disagrees with the categorization of aircraft according to their 'generation' as described. The categorization is unneccessary and misleading, since many aircraft types have capabilities beloning to 4th gen, 5th gen, and 6th gen simultaneously. Also there is a risk of excluding qualified aircraft in NATO led operations, if aircraft generations are used as requirements for participation.
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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Summary of changes

REVISION OF ALLIED JOINT PUBLICATION

AJP-3.3 Edition C, Version 1

- Updates NATO Command Structure and NATO force structure. Chapter 2 (command and control (C2)) has been modified with inputs from Supreme Allied Commander Europe's (SACEUR's) area of responsibility-wide Strategic Plan and SACEUR's Strategic Directive. C2 architecture and command relationships are updated throughout the document.
- Explains operational domains.
- Updates fundamentals to reflect current policy and doctrine in all domains.
- Reduces redundancies with other documents and doctrines; continuity between Allied Joint Publication (AJP)-01, *Allied Joint Doctrine* and AJP-5, *Allied Joint Doctrine for the Planning of Operations* is improved.
- Updates Chapter 5 (the space domain) significantly to reflect current practices and doctrine in advance of the new AJP-3.x *Space Operations* (in development).
- Updates terms and definitions to reflect latest status.
- Emphasises that operations and air power are inherently joint.
- Adds supplementary text in several chapters to explain new or evolving trends (principles of C2, key air power enablers, air capabilities).

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E. ACO Directive 080-070, *Joint Targeting In The ACO.*

F. AJP-01, *Allied Joint Doctrine.*

G. AJP-2, *Allied Joint Doctrine for Intelligence, Counter-Intelligence, and Security.*

H. AJP-2.7, *Allied Joint Doctrine for Joint Intelligence, Surveillance and Reconnaissance.*

I. AJP-3, *Allied Joint Doctrine for the Conduct of Operations*.

J. AJP-3.3.1, *Allied Joint Doctrine for Counter-Air Operations.*

K. AJP-3.3.2*, Allied Joint Doctrine for Close Air Support and Air Interdiction.*

L. AJP-3.3.3, *Allied Joint Doctrine for Air-Maritime Coordination.*

M. AJP-3.6, *Allied Joint Doctrine for Electronic Warfare.*

N. AJP-3.7, *Allied Joint Doctrine for Recovery of Personnel in a Hostile Environment.*

O. AJP-3.9, *Allied Joint Doctrine for Joint Targeting.*

P. AJP-3.10.1, *Allied Joint Doctrine for Psychological Operations.*

Q. AJP-3.11, *Allied Joint Doctrine for Meteorological and Oceanographic Support.*

R. AJP-3.17, *Allied Joint Doctrine for Geospatial Support*.

S. AJP-3.19, *Allied Joint Doctrine for Civil-Military Cooperation.*

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U. AJP-10, *Allied Joint Doctrine for Strategic Communications.*

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[1] Available at https://nso.nato.int/natoterm.

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Preface

Context

1. Allied Joint Publication (AJP)-3.3, *Allied Joint Doctrine for Air and Space Operations* sits under the keystone publication AJP-3, *Allied Joint Doctrine for the Conduct of Operations*. AJP-3 provides overarching doctrine on Allied joint operations, while AJP-3.3 focuses on the unique characteristics and employment considerations for air forces and space capabilities in joint operations.

Scope

2. AJP-3.3 describes the characteristics, roles, missions, organization, and command and control (C2) of air operations and explains the air operations planning process. It also provides an overview of how military space operations can support the joint force.

3. While air is best integrated with the other domains, it is not always used in the joint context (i.e., a no-fly zone). Even in this case however, it would be exceedingly rare that the air domain would not seek integration with other domains to maintain the no-fly zone, which means that hardly any operation is executed by a single domain. Furthermore, the terms 'joint maritime power' and 'joint land power' do not exist, so ‘joint air power’ is not used either in this document. AJP-3.3 covers the use of joint air power drawn from more than one service, but for simplicity, reference is only made to air power. For the same reason, the term ‘joint air operations’ is not used, but reference is made to ‘air operations’.

Purpose

4. The purpose of AJP-3.3 is to provide fundamental principles for the effective employment of air and space capabilities, throughout the range of operations, to achieve Alliance objectives.

Application

5. AJP-3.3 is intended primarily as guidance for NATO commanders and staffs. However, the doctrine applies to, and provides a useful framework for, operations conducted by a coalition of mission participants. It also provides a reference for civilian mission participants.

Structure

6. Chapter 1 outlines the fundamentals of air operations. This includes the air power definition as well as the core air power attributes. It addresses the limitations for conducting air operations before explaining in more detail specific air capabilities.

7. Chapter 2 explains NATO's air C2 architecture and associated command relationships. It describes the responsibilities and products of the NATO Command Structure

Combined Force Air Component Commander, Deputy Commander Air and associated air headquarters, as well as the liaison and coordination requirements with the other component commands.

8. Chapter 3 introduces the principles of air power employment in a multi-domain environment. In addition, it explains the roles of air power and discusses air power employment options and the forces which might be available for air operations.

9. Chapter 4 discusses the planning and tasking of air operations. Within the operations planning process, air planning supports all phases of the planning cycle. The chapter describes the planning steps and considerations, including targeting, weaponeering and the allocation of forces to accomplish the planned mission.

10. Chapter 5 provides the fundamentals of NATO's perspective on the space domain, its attributes, limitations and operational functions. Additionally, it covers space domain functional areas, operations, strategic communications, domain coordination and legal considerations for conducting space operations.

Linkages

11. This publication reflects a clear linkage to the capstone publication AJP-01, *Allied Joint Doctrine*, Military Committee (MC) 133/5, *NATO's Operations Planning*, MC 0324/3, *NATO Military Command Structure*, and MC 400/4, *NATO's Military Strategy Comprehensive Defence and Shared Response*.

12. AJP-3.3 is subordinate to the keystone publication AJP-3. As a level-2 publication, the supporting and functional AJP-3.3 sits at the top of air and space operations doctrine, with subordinate level-3 documents and tactical publications covering further details.

13. Subordinate tactical publications, designated Allied tactical publications (ATPs), contain further supporting details in the form of tactics, techniques and procedures which include ATP-3.3.2.1, *Tactics, Techniques and Procedures for Close Air Support and Air Interdiction*, ATP-3.3.3.1, *Air-Maritime Coordination Procedures (AMCP)* and ATP-3.3.5.1, *Joint Airspace Control Tactics, Techniques and Procedures*.

14. The numbering of the AJPs and ATPs adheres to the *Allied Joint Doctrine Architecture* and follows both the hierarchical system as well as the sequence that fits the logical flow of level numbering.

Chapter 1 - Fundamentals of air operations

Section 1 - Introduction

1.1 The North Atlantic Treaty Organization (NATO)'s capstone publication for Allied joint doctrine states that NATO forces must expect to perform a wide range of potentially simultaneous activities across all domains in a continuum of competition, from peacetime military engagement to warfighting. This continuum of competition is the backdrop against which all air and space operations are conducted, the principal discriminator being whether the threshold of armed conflict has been surpassed. Air and space operations contribute to all three NATO core tasks; deterrence and defence, crisis prevention and management and cooperative security. Moreover, air power can create a wide range of effects contributing to engagement, deterrence, and coercion activities at the tactical, operational and strategic levels, often within very rapid time responses.

1.2 Alliance operations have shown that air power is most effective when integrated with other joint force capabilities and national instruments of power rather than used in isolation. Consequently, joint and multi-domain planning is the process by which operational-level commanders seek to balance ends (objectives), ways (broad approaches) and means (resources); underpinned by robust doctrine that addresses how best to employ air power. Given the importance of space and cyberspace as operational domains through which exploitation effects can be created, air power must be integrated and synchronized in time, space and purpose with the other domains to achieve the operational objectives. Furthermore, the comprehensive approach dictates a more nuanced understanding of the role of the military instrument of power when planning and conducting air operations. At the operational level, this approach involves the selective combination of lethal and non-lethal actions, coordinated with the activities of other organizations, to create physical, virtual and cognitive effects to achieve operational objectives in support of the strategic objectives and the end state.

Section 2 - The air domain

1.3 The Alliance can use a variety of military and non-military capabilities to change the behaviour of decision-makers, states, and non-state organizations to achieve objectives. Air power offers specific, flexible, and responsive ways to create those effects, ranging from direct physical attacks to more nuanced, psychological effects. The ability of air power to create influence leads to a definition of air power as: 'the ability to use air capabilities to influence the behaviour of actors and the course of events'.[2]

[2] This definition is a new proposed term and is being processed for NATO Agreed status (TTF 2023-0097).

1.4 The air domain, shaped by the air environment,[3] is unique. It uses the air operating environment which surrounds the globe and overlays the land and sea, theoretically allowing aircraft access to any point on Earth. The air domain can be applied independently or in combination with the other operational domains to achieve decisive impact through joint operations.

Section 3 - Core air power attributes

1.5 Air power offers the advantage of finding, fixing, tracking, targeting, engaging and assessing adversary forces across the full depth of the engagement space, without many of the same physical, spatial, and environmental limitations imposed on surface forces. The synergy of Alliance air capabilities and surface forces, supported in space and cyberspace, and operating as an integrated joint force can often be overwhelming in cases where a single component cannot be decisive by itself.

1.6 Air power exploits the nature of the air operating environment. Airborne capabilities are generally faster than surface and sub-surface assets[4] and can often route directly to a target or destination by using their advantage of height. These factors result in the three core air power attributes: speed, reach, and height.

a. **Speed.** The speed of air platforms enables military power to be projected rapidly and responsively to complete missions. This creates tempo and the potential to exploit time.

b. **Reach.** About 70% of the Earth's surface is water. Only 30% is land. Both, land and sea, are covered by air. This provides aircraft with unrivalled reach, normally unimpeded by terrain, and can provide access to an adversary's resources to attack or influence, however distant or isolated their location.

c. **Height.** The advantage of height is an enduring military reality. Air power offers an elevated vantage point, facilitating observation and thereby supporting activities within the land and maritime environments.

1.7 The three core air power attributes enable and enhance air power's additional attributes of ubiquity, agility, and concentration. In combination, these provide air power's characteristic flexibility as a responsive and easily scaled tool of the military instrument of power.

a. **Ubiquity.** Air power's reach, combined with the growing persistence available through air-to-air refuelling (AAR) and long-endurance unmanned aircraft (UA),

[3] The air operating environment extends from the Earth's surface to the altitude where aerodynamic flight becomes impossible.
[4] Land vehicles and maritime vessels, including submarines.

creates the sense of being everywhere all the time. This enables the Alliance to use air power to pose or counter adversaries simultaneously, and across a far wider area than surface capabilities.

b. **Agility.** Air power's agility stems from its responsiveness, enhanced by the capabilities of genuinely multi-role and multi-mission platforms.[5] Agility means the Alliance can quickly switch the point of application within and between areas of operation, sometimes during the same mission, and create tactical to strategic effects across the engagement space in a variety of air power operational roles. Agility also means operations can easily be scaled up or down in response to a change in political guidance or political strategic objectives, from air policing at one end of the spectrum to full-scale warfighting at the other.

c. **Concentration.** Air power's speed and reach enable concentration of air assets in time and space to deliver military force when and where it is required. Precision technology means that significant effects can be created without the need for large numbers of aircraft or munitions. Rapid creation of concentrated effects from the air, more quickly than any surface-based force normally can do, can impose a psychological shock that may be crucial to military success.

1.8 In combination, air power's attributes enable the delivery of significant combat power. Speed, reach and height, coupled with modern sensor technology, precision weaponry and, for many aircraft, the ability to remain aloft for extended periods, provide the capability to shape and influence the operating environment. Moreover, the ubiquity and agility of air power means that it can be used to revisit points of interest within short response times or cover multiple joint operations areas in one sortie, thereby delivering an additional degree of persistence. Equally, air power can be used fleetingly and with a very small footprint to offer covertness, discretion and deniability, should these be required.

Section 4 - The limitations of air power

1.9 Air power has limitations as well as strengths. However, these limitations are relative and situational, not absolute. They can be managed using other platforms and/or systems support and must be evaluated and understood in context. The most significant limitations are impermanence, limited payload, vulnerability and cost.

a. **Impermanence.** Although long endurance UA and AAR have increased individual aircraft persistence, aircraft still have limited endurance and require ground servicing and rearming. To that extent, air power is an impermanent form of military power. However, the reach and responsiveness of air power can be exploited to hold adversaries at risk without necessarily maintaining a constant presence in the air. If a

[5] Air platforms with the capability of switching between several tasks/roles during the same mission and/or between two different missions (ground servicing/configuration change/refuelling needed).

continuous presence is required, multiple air assets can be employed serially to satisfy commander's intent. Another feature of this attribute is the fact that air power alone cannot hold terrain. This is particularly true in urban environments.

b. **Limited payload.** Aircraft design places a practical limit upon the payload that can be carried. However, miniaturization and precision technology are enabling greater effectiveness with fewer and smaller weapons, whilst the use of air transport instead of surface transport sacrifices weight of payload for advantages in speed and reach. A small payload delivered quickly may be of more value in influencing a critical situation than a larger one deployed much later.

c. **Vulnerability.** Air power has a number of vulnerability considerations: the relative fragility of aircraft, the effects of weather on air operations, and the requirement for logistics and basing.

(1) **Fragility.** Air platforms are comparatively lightly armoured which limits the extent to which it is sensible to expose them to hostile fire. Whilst tactics, techniques and procedures, low observable technology, and platform protection can be used to manage the operating risk, air planners must be cognisant of the capabilities (and limitations) of the platforms assigned to a campaign or operation.

(2) **Weather.** Adverse weather conditions (including that resulting from events such as space weather or a volcanic eruption) can hamper air operations. Therefore, commanders require accurate, timely, and relevant environmental information to maximize the effectiveness of air systems and missions.[6] However, technological developments have enabled Alliance air forces to operate by day and night in adverse conditions; providing a potential operational and tactical advantage that can be exploited against less capable opponents.

(3) **Basing.** Like other forms of military power, most air capabilities depend on regional bases for support. Consequently, diplomacy may be a key enabler for air operations to secure the necessary access, basing, and over-flight permissions. The protection of air forces relies on the protection of operating bases, maritime air operating platforms, command, control, communications and information exchange networks and logistical nodes. Air assets are expensive, fragile, and scarce and typically operate from large static bases or

[6] Geospatial, meteorological and oceanographic data and products and/or its combination assists operations by the provision of information on the state and operational impacts of the air, maritime, land and space environments that may enhance or impede the effectiveness of air operations. Thus, the gathering, analysis and provision of geospatial, meteorological and oceanographic information for mission planning and execution is a key element of information superiority.

maritime assets. These are difficult to conceal even when operating from dispersed, forward, and/or remote operating locations. Force protection measures and activities, commensurate to the risks posed by adversaries and hazards, are required to ensure freedom of action and to mitigate the potentially strategic consequences of loss of highly capable air capabilities. Carrier-based air power can mitigate some challenges in maritime and littoral areas, but it also concentrates aircraft making them vulnerable if attacked.

d. **Cost.** Military aircraft use cutting-edge technology, which, inevitably, comes at significant financial cost. But this cost must be balanced against the multiple and adaptive capabilities delivered. Moreover, air power offers alternative policy options to the large-scale commitment of land forces, with the heavy financial and human consequences that this frequently entails.

Section 5 - Air capabilities

1.10 Air capabilities naturally centre on aircraft, which NATO defines as: 'any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the Earth's surface'. This definition therefore includes fixed-wing, rotary-wing and tilt-rotor aircraft, both manned and unmanned. The capabilities of individual aircraft types have developed significantly over the past few decades, notably in regard to enhanced precision attack capabilities, intelligence, surveillance and reconnaissance (ISR) sensors, low-observable technology and data link connectivity. Consequently, more aircraft types are now capable of conducting multiple air power roles during a sortie, often simultaneously. This enhances the inherent flexibility of air power and offers the operational commander a tailored response to evolving circumstances and an array of capabilities that can rapidly transition between tasks.

Manned aircraft

1.11 Manned aircraft continue to provide the bulk of air power capabilities. Whilst UA technology continues to develop at a rapid pace, the presence of an on-board crew currently remains essential to successfully execute most core air missions; this is especially the case within a contested environment where command and control is potentially limited, high energy combat manoeuvring may be necessary or close tactical coordination between a large number of aircraft may be required to achieve the necessary combat mass. Below the threshold of armed conflict, the use of manned aircraft in the air mobility role ensures regulatory requirements concerning passenger safety are met whilst larger ISR aircraft carry a multi-discipline crew able to exploit the information gathered in real time. Whilst manned aircraft carry with them an inherent risk to the crew that cannot be eliminated, particularly within high-threat environments, currently they represent the most flexible method of delivering decentralised execution of air tasks across the broadest set of probable scenarios.

1.12 Manned combat aircraft are generally categorised according to their 'generation', which broadly reflects their capabilities. A generational shift in combat aircraft occurs when

a technological innovation cannot be incorporated into an existing aircraft through upgrades and retrofits. There are currently five broadly accepted generations, although most NATO air forces are now equipped with fourth and fifth generation aircraft.

a. **Fourth generation.** Fourth generation aircraft are those designed to bridge the gap between the developments of the 1960s and 1970s and those entering service after 2000. Key characteristics include: high manoeuvrability and supersonic dash performance; fly-by-wire controls; mechanically scanned radar; and a look-down, shoot-down air-to-air capability.

b. **Fifth generation.** Fifth generation aircraft combine new developments such as thrust vectoring, composite materials, super cruise (the ability to cruise at supersonic speeds efficiently), low-observable technology, advanced electronically scanned radars and sensors, and integrated avionics to greatly improve crew situational awareness.

Unmanned aircraft

1.13 There is, after over a century of manned flight, a broad understanding of the variety, operation and regulation of manned aircraft; however, the past couple of decades have seen an almost exponential increase in the development, capability and use of UA. Whilst this publication seeks to reflect the normalisation of the operation of UA, there are some areas in which UA differ from manned aircraft that merit inclusion. These areas are classification, terminology and legal aspects, which are discussed below.

1.14 Due to the lack of a requirement to accommodate a human being, UA can be significantly smaller than manned aircraft, thus the range of sizes can be greater than that of manned aircraft. This led to a requirement to categorise UA to provide a reference tool for the procurement, regulation and operation of them.[7]

1.15 There is much public and academic debate around the definitions of automated and autonomous when applied to weapons systems. Lethal autonomous weapons systems are the subject of international discussion within the Group of Governmental Experts related to emerging technologies in the area of lethal autonomous weapons systems under the framework of the Convention on Certain Conventional Weapons; however, there is no international agreement over the definitions or characteristics of these systems.

[7] Unmanned aircraft systems (UAS) are defined as: Class I UAS if the associated UA has a maximum take-off weight (MTOW) below 150 kg; Class II UAS if the associated UA has a MTOW between 150 kg and 600 kg; and Class III UAS if the associated UA has a MTOW above 600 kg.

1.16 NATO policy is that the operation of weapons with artificial intelligence applications, including UA and associated systems, will be with appropriate levels of judgment and care; clear human responsibility shall apply to ensure accountability. Whilst weapon systems may operate in automatic modes, there is appropriate human-machine interaction.

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Chapter 2 - Command and control

Section 1 - Introduction

Introduction

2.1 Effective command and control (C2) underpins the successful employment of all elements of the military instrument; it is not unique to air power. However, air power, by the very nature of its work, can be extremely sensitive to any misdirection and operational experience has highlighted that air power has to be supported by a fast decision cycle if it is to be employed effectively. Additionally, air power's ubiquity means that it can be applied across multiple theatres, joint operations areas (JOA) or even globally with competing demands placed upon limited resources. Consequently, air C2 is the key enabler without which the four fundamental air power roles outlined in Chapter 3 cannot be delivered effectively, irrespective of the size or nature of an operation.

Principles

2.2 Unity of command ensures the concentration of effort for every objective is placed under one responsible commander. This is particularly important for air operations, irrespective of where on the continuum of competition they take place. Air assets are highly sought after because they can pursue strategic, operational and tactical objectives simultaneously. However, they can be limited in numbers or availability, so there is significant potential for fragmentation of the air effort. A request for tactical air support could compete with the allocation of the same air resource for operational or strategic objectives. Consequently, centralised command of air power under a single air commander is a fundamental tenet of air C2. In most operational circumstances, this is the Combined Force Air Component Commander (CFACC).[8]

2.3 To ensure the effective employment of air power, competing demands must be prioritised and apportioned accordingly. The enduring principle of centralised control[9] therefore ensures that aircraft are used as efficiently as possible to achieve military objectives. It prevents them from being inappropriately tasked by uncoordinated users against impractical objectives or being divided into small packages of air power that would inhibit flexibility and hinder the requirement for a rapid concentration of force. In addition, air operations can take place simultaneously across one or multiple JOAs. However, no single person is likely to have the level of situational awareness required to manage all concurrent activities. Decentralised execution[10] delegates execution authority to subordinate or on-

[8] Under normal circumstances this is Commander Allied Air Command.
[9] The retention of authority by a commander to direct actions to achieve their objectives.
[10] Delegation of the appropriate authority to a subordinate commander to execute their assigned tasks and missions. This enables subordinate or on-scene commanders to make decisions that exploit opportunities in complex, rapidly changing or fluid situations.

scene commanders, thereby shortening the decision cycle and increasing speed of action. It is also the best option for complex air campaigns, especially where communications or data links may be degraded or denied.

2.4 Given the contemporary operating environment, NATO's preferred method of air C2 is centralised control and decentralised execution. This is delivered via a task-oriented command structure and associated command relationships that are designed to best fit the operational circumstances and ensure that air power is employed effectively. The standing NATO air C2 construct supports this approach with customisable units within the NATO Command Structure (NCS) and the NATO force structure (NFS). These are outlined in the next section. However, operational experience has shown that the overarching air C2 structure employed must satisfy five broad design considerations if NATO air power is to be employed successfully. These apply across the continuum of competition from baseline activities and current operations (BACO), through crisis, up to an Article 5 maximum level of effort.

a. **Flexibility.** Capable of responding to a changing operational situation with minimum disruption or delay.

b. **Responsiveness.** Able to provide the air commander, or their key subordinates, with the understanding required to make effective decisions and to pass subsequent orders quickly.

c. **Survivability.** Including protection from cyberspace and traditional threats as well as redundancy for critical C2 facilities and communication and information systems (CIS).

d. **Sustainability.** Capable of conducting continuous operations throughout all phases of an operation.

e. **Interoperability.** With joint and coalition C2 systems to enable unity of command in the air domain.

Section 2 - The joint force air component organization model

2.5 The primary commanders within the air organization and the joint force air component (JFAC)[11] are the Commander Allied Air Command (COM AIRCOM), the CFACC, the Theatre Component Command Commander (TCCC),[12] the Combined Force Space Component

[11] The JFAC consists of the CFACC, the respective staffs to maintain the processes and the forces to deliver airpower when authority is transferred.
[12] For more details see Reference FF, SASP, *SACEUR's AOR-wide Strategic Plan*, SH/COM/SAC/WC/20210817/2.

Commander (CFSpCC), the Deputy Commander Air (DCDR-Air) and the NFS COM JFACs and national COM JFACs.

2.6 COM AIRCOM is NATO's principal air advisor to the Supreme Allied Commander Europe (SACEUR). COM AIRCOM ensures educated, trained and equipped personnel for peacetime and/or crisis and/or defence operations are available when needed. In addition, COM AIRCOM is responsible for a standing responsive, robust and tailored air component C2 structure. COM AIRCOM is granted direct liaison authority and coordination authority with mission participant air and space forces. Headquarters Allied Air Command (HQ AIRCOM) is COM AIRCOM's primary C2 element.[13]

2.7 COM AIRCOM can assume the roles of CFACC, TCCC and CFSpCC for air and space domain missions, operations and activities in SACEUR's area of responsibility (AOR).

2.8 The CFACC exists from BACO to maximum level of effort. The CFACC assumes specific operational-level authorities and executes operational control (OPCON) over assigned forces. The CFACC's primary task is to maximise the effectiveness of air power throughout SACEUR's AOR. The CFACC may be designated as the supported or supporting commander. As a supporting commander, the CFACC provides integrated air activities.[14] The NATO Command Structure joint force air component HQ (NCS JFAC HQ) is the CFACC's primary C2 element.[15]

2.9 The CFSpCC also exists from BACO up to maximum level of effort. The CFSpCC synchronizes space operational activities and advises SACEUR on all aspects of the space domain. Although nations are expected to maintain C2 and sovereignty for their space systems, the CFSpCC could exercise OPCON, at the direction of SACEUR, of space capabilities or space data, products and services provided to NATO.[16] The CFSpCC is supported by a staff element, the NATO Space Centre,[17] co-located with HQ AIRCOM or within the NCS JFAC HQ.

2.10 For any operation, the CFACC advises SACEUR on the recommended air C2 structure for North Atlantic Council approval. The CFACC may recommend utilising a DCDR-Air. The DCDR-Air is capable of commanding a joint operation up to a small scale, or supporting a commander joint force command (COM JFC) in a specific JOA. If a DCDR-Air is activated, the CFACC may delegate them some, none, or all their roles, responsibilities and authorities,

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[13] For details regarding the NCA see Annex A .
[14] For more details see Reference FF.
[15] For more details see Reference D, AC/OPS/CJFAC/OSJX/CH/33-0613, *AIRCOM JFAC handbook*.
[16] For more details see Reference FF.
[17] The NATO Space Centre serves as a focal point to: support NATO's activities, operations, and missions; share information; and help coordinate Allies' efforts in the space domain. The Space Centre liaises with national space organisations to ensure that NATO commanders have access to required space data and services. Streamlining requests for space products through a single organisation increases NATO's responsiveness and supports timely decision-making.

depending on the operational situation. A DCDR-Air is the voice of the CFACC and their direct representative to the supported commander(s). The DCDR-Air combined staff (CS) is DCDR-Air's primary C2 staff.

2.11 The NCS[18] contains standing C2 elements and CIS that includes the personnel, procedures and equipment necessary to plan, direct and control air operations. The NCS elements are: the combined air operation centres (CAOC) and control and reporting centres (CRC); the Deployable Air Command and Control Centre (DACCC) Poggio Renatico, including the deployable air control centre, recognised air picture production centre and sensor fusion post, and; the NATO airborne early warning and control force.

2.12 In addition, the NFS allows for other nations to contribute with their national JFAC HQ and deployable CRCs, or similar.

2.13 Standardized information technology enables NATO to seamlessly manage all types of air operations and airspace, integrating air traffic control, surveillance, air mission control, airspace management, and force management functions.

Section 3 - Combined Force Air Component Commander

Authority and command relationships

2.13 The CFACC is given the authority to accomplish missions and tasks assigned by SACEUR for theatre-wide air missions and in support of a COM JFC.[19,20] The CFACC exercises OPCON over assigned forces and tactical command over other air capabilities and forces made available for tasking. The CFACC concept supports multiple JOA operations. To do so, CFACC can delegate authorities to DCDR-Air. In all types of operations, transfer of authority of forces should be accompanied by a national representative[21] holding the authority to veto missions/tasks in accordance with national caveats.

2.14 The CFACC plans, tasks, coordinates, and controls air operations in support of joint campaign(s) and executes any operational missions assigned by SACEUR or a supported joint commander. The CFACC ensures the theatre-wide synchronization of NATO air C2 entities and is responsible for integrating the theatre component commands (TCC).[22]

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[18] The NCS, NCS JFAC and DCDR-Air CS air C2 elements are described in Annexes A and C.
[19] Command relationship. NATO component commanders are typically OPCON from the joint commander for assigned and attached forces. Component commanders can subsequently delegate tactical command or tactical control to other commanders.
[20] For readability, in the remaining part of the document the COM JFC is called the joint commander.
[21] Also known as the 'red card holder'.
[22] Allied Air Command, Allied Maritime Command, Allied Land Command, Aillied Special Operations, Joint Support Enabling Command and the NATO Cyber Operations Centre.

2.15 Based on SACEUR's or the joint commander's direction and guidance, the CFACC, in his role as TCCC, makes recommendations for the employment of assigned forces and the allotment of air assets, in support of multi-JOA operations. The CFACC will exercise their responsibilities through HQ AIRCOM at Ramstein, or, when activated, through the NCS JFAC HQ. Depending on the scale of a crisis, or in the case of multi-JOA operations, the CFACC can decide to appoint one or more DCDR-Air.[23]

2.16 SACEUR establishes the supported/supporting interrelationship between the joint commander and the CFACC. Under this formal relationship, the joint commander could further establish supported/supporting relationships between component commands (CCs) and DCDR-Air at the tactical level, when required for mission accomplishment. Operational C2 relationships vary depending upon the size, complexity, and location of the mission. C2 relationships are established by SACEUR and specified in the strategic operations plan.

2.17 CFACC and DCDR-Air execute their C2 functions through elements of the air surveillance and control system, consisting of airborne and ground-based entities or ships, with their associated sensors, data links and radios.

Combined Force Air Component Commander responsibilities[24]

2.18 As described earlier, the authorities of the CFACC and DCDR-Air include planning, integrating, allocating, tasking, assessing, and controlling the execution of air operations.[25] Responsibilities are of specific importance when multi-JOA operations are to be supported given the number of relevant stakeholders is significantly increased, objectives can differ, and the area of employment for air assets spreads over a much larger geographical area. Consequently, synchronizing battle rhythms, increased coordination, and prudently planned assets, specifically high value assets, must be considered, and a high level of multi-domain collaboration is required. The most important responsibilities of the CFACC are as follows.

a. The CFACC as a TCCC, provides command, control and coordination to the air operating locations and enablers within any assigned JOA. The CFACC ensures that the joint commander's orders and direction are enacted within the air component. The CFACC also represents the air component requirements (such as resource requirements) at the joint level.

b. Functions as a supported/supporting commander as designated by SACEUR.

[23] For details: see Reference D, AC/OPS/CJFAC/OSJX/CH/33-0613, *AIRCOM JFAC handbook*.
[24] For details and overall responsibilities see Reference D.
[25] For details see SACEUR's AOR-Wide Strategic plan, SH/COM/SAC/WC/20210817/2.

c. Synchronizes the theatre air campaign and maximise theatre-wide and cross domain effectiveness of air power with all relevant TCC.[26] Integrates theatre-wide air operations with the operations of other TCCs.

d. Contributes to strategic situational awareness and ensures shared information, intelligence, and operational data to support collaborative planning and decision making.

e. Develops a theatre-wide air operations plan (AOP) and a periodic air operations directive (AOD) to best support SACEUR's or the joint commander's intent in concert with other component commanders.

f. Recommends theatre-wide allotment to SACEUR and gives apportionment guidance to DCDR-Airs to support the joint commanders.

g. Assesses the results of air operations within their AOR and forwards assessments to the joint commanders to support the overall assessment effort.

h. Provides and receives appropriate liaison personnel including national representatives.

i. Performs the duties of the airspace control authority (ACA), unless a separate ACA is designated.

j. Performs the duties of air and missile defence commander (AMDC), unless a separate AMDC is designated.

k. Establishes personnel recovery coordination cells (PRCC). When designated, the PRCC acts as the joint personnel recovery centre to exercise overall responsibility for personnel recovery (PR) in the JOA.

l. Owns all aspects of force protection of assigned forces.

Combined Force Air Component Commander additional roles

2.19 Some of the CFACC responsibilities, although briefly described previously, require a more detailed description.

a. **Air and Missile Defence Commander.**

(1) SACEUR designates an AMDC as the commander with overall responsibility for air and missile defence (AMD) throughout SACEUR's AOR.

[26] TCCs are warfighting headquarters in command of domain activities, spanning geographical areas and/or JOAs; see Reference GG, SH/SDP/SDF/OCS/19-002439, dated 20 December 2019, *Joint CONOPS*.

This function is assigned to the commander with the preponderance of AMD assets and the appropriate command, control and communications capability. The role is normally delegated to the CFACC.

(2) The AMDC has the overall responsibility to plan and execute integrated AMD operations integrating and coordinating the AMD forces of each component by developing a coherent joint AMD plan. This includes establishing weapons control procedures and measures for all defensive counter-air weapon systems and forces, coordination with regional/host nation air and missile defence systems, and the exchange of information necessary to support civil defence activities.

(3) Additionally, the AMDC is responsible for the production and dissemination of the recognized air picture throughout SACEUR's AOR. The AMDC applies the principles of air defence (AD) to counter hostile air activity, including air breathing adversaries, ballistic missile or cruise missiles and promulgates and employs common procedures for AD battle management and the reduction of mutual interference. In doing so, the AMDC considers any AD required and organized around maritime and land units.

(4) AMD operations are integrated with other tactical air operations within the area of operations (AOO) through the AMDC.

b. **Airspace control authority.**

(1) The CFACC can be appointed as ACA. The goal of airspace control is to increase combat effectiveness by promoting the safe, efficient, and flexible use of airspace. It helps reduce friendly fire incidents by facilitating the safe passage of friendly and neutral aircraft, and the engagement of adversary aircraft and missile threats in airspace that may be used by all components, civilian, or neutral air traffic, including international organization and non-governmental organization (NGO) activities. The ACA establishes deconfliction procedures.

(2) The ACA is the commander designated to assume overall responsibility for the management of the airspace control system throughout SACEURs AOR. When multi-JOA operations are conducted, the duty of the ACA may be delegated to a single commander, generally the DCDR-Air, for one or more JOAs. If a single commander assumes the ACA function in each JOA, then close coordination between commanders becomes essential. In consultation with appropriate components and civilian authorities, the ACA develops the airspace control plan (ACP), taking into consideration any coordination required and organized around maritime, land, and other units operating in the area. The ACA then executes the ACP through the implementation of airspace control means (ACM) and the development and promulgation of the daily airspace

control order (ACO) and any special instruction through the joint airspace coordination centre (JACC). All components are required to comply with the ACP and the ACO.

Section 4 - Combined Force Space Component Commander

2.20 COM AIRCOM can be appointed as the CFSpCC. The CFSpCC advises SACEUR on space related matters. In addition, CFSpCC is responsible for synchronizing and prioritising NATO space efforts across all domains. The CFSpCC provides space domain awareness, synchronises intra-theatre logistics necessary for space activities and coordinates campaign planning, training and execution. The CFSpCC supports the full range of multi-domain activities and multi-JOA operations. The CFSpCC exercises their responsibility from the NATO Space Centre, co-located with HQ AIRCOM, or from the NCS JFAC HQ.

2.21 Some of the CFSpCC responsibilities are:[27]

a. supports multi-JOA operations with space data, products and services (when authority is transferred);

b. acts as domain advisor to SACEUR;

c. provides theatre-wide domain awareness; and

d. coordinates domain campaign planning with the supported commander.

Section 5 - Deputy Commander Air

2.22 If activated, the DCDR-Air is the air commander, designated by the CFACC, tasked to support a specific joint commander. The DCDR-Air, including the CS, may be provided by the CAOCs/DACCC and/or NFS JFAC HQs, if activated. If the DCDR-Air is appointed from an NFS entity, the nations shall provide their own infrastructure for exercising air C2. Alternative locations for the NCS JFAC HQ and DCDR-Air CS can be considered, if the situation demands. In both cases, the CFACC should ensure that the necessary communication links to the appropriate DCDR-Air are established wherever they are deployed. Amongst others, DCDR-Air responsibilities are to develop and to coordinate tactical plans for the appropriate JOA, plan and execute an air tasking order (ATO) and liaise with higher commands.

[27] For more details see Reference D, AC/OPS/CJFAC/OSJX/CH/33-0613, *AIRCOM JFAC handbook*.

2.23 When tasked, the CFACC advises SACEUR on an appropriate air C2 structure for approval. In certain circumstances, the CFACC may recommend the implementation of one or more DCDR-Airs. However, the CFACC retains OPCON of DCDR-Airs.

2.24 The following responsibilities, amongst others, may be delegated to a DCDR-Air:

a. Contributing to the master AOP;

b. Exercising OPCON over delegated forces;

c. The authority to make apportionment recommendations;

d. Providing ATO inputs; and

e. Acting as the air component coordination element (ACCE).

Section 6 - NATO Command Structure Combined Force Air Component Commander and Deputy Commander Air combined staff products[28]

2.25 As the primary C2 tool of the CFACC, the NCS JFAC HQ[29] produces planning, tasking and airspace control documents including the following.

a. **Air concept of operations and supplements.** The air concept of operaions and its supplements are clear and concise statements of the course of action chosen by a commander to accomplish the mission.

b. **Air operations plan and supplements.** The CFACC or DCDR-Air employs an air operations planning group (AOPG) to create an AOP and any supporting plan (supporting plan air) to the strategic operation plan (OPLAN). The AOP and its supplements are plans for a single or series of connected operations to be carried out simultaneously or in succession. It is a directive employed by higher authority to permit subordinate commanders to prepare supporting plans and orders.

c. **Air operations directive.** To best employ the available capabilities, the CFACC or DCDR-Air translates higher-level guidance, such as that provided in the joint coordination order, into tactical-level air instructions through the AOD, which provides direction and guidance to the planning and execution branches of the NCS JFAC HQ or DCDR-Air CS and forms the basis for the ATO. It also outlines the

[28] The organization of the NCS JFAC HQ is described more in detail in Annex B.
[29] Some tasks can be delegated to the DCDR-Air or a NATO force structure joint force air component headquarters when activated. For details: see Reference D, AC/OPS/CJFAC/OSJX/CH/33-0613, *AIRCOM JFAC handbook*.

CFACC or DCDR-Air's guidance for the execution of the air plan such as priorities and objectives. The AMD plan is added to the AOD as an annex.

d. **Airspace control plan and airspace control order.** When the CFACC or DCDR-Air is directed to execute the role of ACA, the NCS JFAC HQ establishes airspace control procedures during crisis and conflict within the assigned area based on an ACP. Airspace control is used for deconfliction and identification. Therefore, a procedural system of airspace control is necessary. This system is based on several ACM designated and activated by an ACO. The ACO is compiled and promulgated by the JACC.

e. **Air tasking order.** The ATO contains detailed tasking for all air missions scheduled to operate within the theatre or JOA during a specific timeframe. It contains information both on missions under tactical command/tactical control of the CFACC or DCDR-Air as well as other air missions within SACEUR's or the joint commander's assigned area.[30] When multi-JOA operations are conducted, the NCS JFAC HQ generates a single integrated theatre ATO, established from ATO feeds provided by each DCDR-Air with inputs from organic air assets from other components, ensuring theatre-wide synchronisation and deconfliction of air assets.

f. **Special instructions.** The ATO also contains the special instructions (SPINS). Baseline SPINS are intended to provide information, direction and guidance that apply to a longer period than just the intended ATO period or to more than one part of the ATO. Baseline SPINS are published weekly or monthly. ATO SPINS should not contain already established procedures. ATO SPINS are published daily.

g. **Coverage mission order and surface-to-air missile and short-range air defence[31] tactical order.** The coverage mission order and surface-to-air and short-range AD tactical order task surface-based units to defend a defined area or asset and control their defence posture.

h. **Operational tasking data link.** The operational tasking data link (OPTASK LINK) specifies the operational management details for tactical data links of all (link-fitted) forces in the JOA. The OPTASK LINK is developed in close coordination with the other CCs.

i. **Operational tasking electromagnetic warfare.** Overarching coordination of electromagnetic warfare activities must be executed through the joint commander's

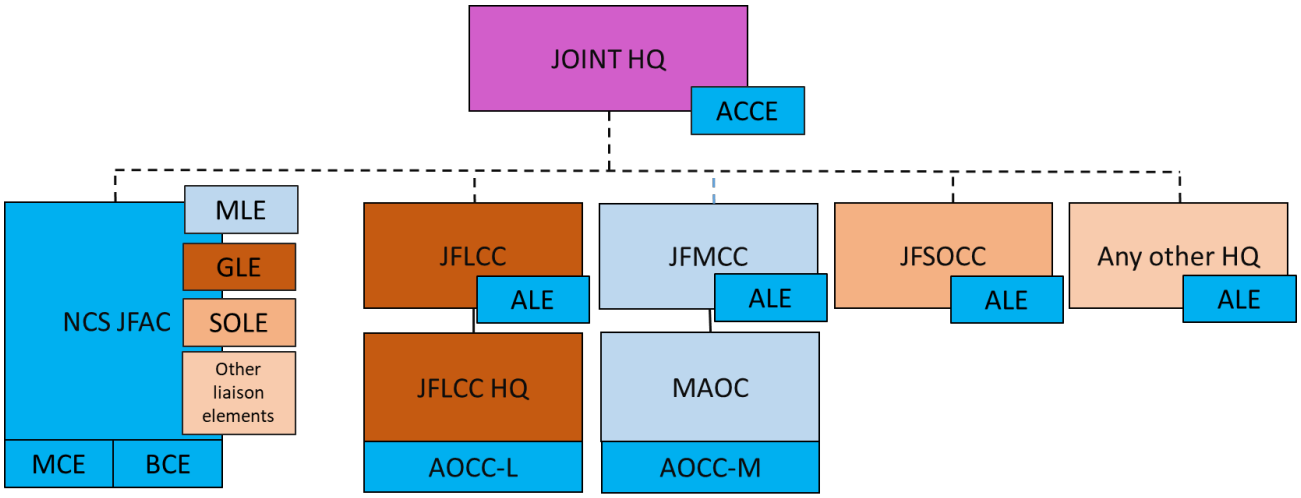
[30] Close coordination between all TCCs will be necessary to permit effective use of available resources and the deconfliction of air operations. The result of this coordination is reflected in the ATO and the operational tasking anti-air warfare.

[31] These orders have another format for air-maritime coordination messages, as per Allied Tactical Publication-3.3.3.1, *Air-Maritime Coordination Procedures (AMCP)*, ED B_V1.

signals intelligence and electromagnetic warfare operations centre or the electromagnetic battle staff.[32] The operational tasking electromagnetic warfare can be issued by each of the joint commanders, based on their AOO. It supplements and completes the ATO/SPINS instructions as it provides more detail for planning and executing specialized electromagnetic warfare missions.

Section 7 - Liaison and coordination

2.26 Effective liaison between forces is essential for coordinated operations and is a key factor in the success of joint operations. This applies for maximizing cross domain effect generation in the context of multi-domain operations. Liaison elements serve as their parent commander's representative on matters of capabilities and limitations. Components have ready access to the CFACC or DCDR-Air, the NCS JFAC HQ or DCDR-Air CS and the other components through their liaison officers (LO).



JOINT HQ	Joint Force Command headquarters	MLE	maritime liaison element
ACCE	air component coordination element	GLE	ground liaison element
NCS JFAC	NATO Command Structure joint force air component headquarters	SOLE	special operations liaison element
MCE	maritime coordination element	JFLCC	joint force land component command
BCE	battlefield coordination element	JFMCC	joint force maritime component command
MAOC	maritime air operations centre	AOCC-L	air operations coordination centre - land
ALE	air liaison element	AOCC-M	air operations coordination centre - maritime
JFSOCC	joint force special operations component commander		
- - - - -	supporting/supported		

Figure 2.1 – Task force liaison elements

[32] See Allied Joint Publication-3.6, *Allied Joint Doctrine for Electronic Warfare*, for more details about signals intelligence and electromagnetic warfare operations centre and electromagnetic battle staff.

NATO Command Structure: Combined Force Air Component Commander liaison with Supreme Allied Commander Europe or joint commanders

2.27 **The air operational liaison and reconnaissance team.** The air operational liaison and reconnaissance team (AOLRT)[33] is the HQ AIRCOM application of the operational liaison and reconnaissance team concept. It is responsible for the air domain and acts in accordance with the AOPG leader's directions and guidance. The AOLRT can be used in peacetime, crisis, and conflict, during Article 5 and non-Article 5 operations, including NATO Response Force and crisis response operations. During the early stages of a crisis, NATO's decision-making process requires accurate information in support of the operations planning process to provide the AOPG with the necessary information. The AOLRT is a pre-determined panel of personnel drawn from the NCS JFAC HQ. It is a flexible and rapidly deployable entity tailored to the needs of the mission.

2.28 **The air component coordination element.** Significant coordination and deconfliction between the joint commander and the CFACC is required during preparation for operations and execution. Therefore, the CFACC or DCDR-Air need to be represented in the various joint boards and working groups that take place in the joint HQ to support the joint commander's decision-making process. At the joint commander's level, this coordination and liaison is done by the ACCE. The ACCE facilitates interaction and communication between the CFACC or DCDR-Air and other joint HQ staffs. The Chief ACCE is the CFACC's primary liaison and personal representative to the joint commander and speaks on their behalf. Although the members of the ACCE integrate with the joint HQ, they remain under functional C2 of the CFACC or DCDR-Air. If required, the DCDR-Air can act as the Chief ACCE.

Liaison with other components

2.29 In general, a component liaison element serves as the conduit for coordination between its functional components and the supported/supporting components. The liaison element represents its component commander's perspective and ensures understanding of relevant considerations for the employment and integration of air power within joint operational planning and execution. The liaison element should possess the authority to represent its commander regarding time-sensitive and critical issues, and be equipped and authorized to communicate directly with its commander. A component liaison element needs to be familiar with the details of all its component's missions. It should possess the ability to influence the tasking of component capabilities.

2.30 **The air liaison element.** The air liaison element (ALE) is an air staff element under the command of the CFACC or DCDR-Air located within any of the other relevant CCs. The chief ALE has the authority to speak for the CFACC or DCDR-Air. The ALE provides the means for effective component-to-component liaison and is the primary conduit for

[33] For details: see Reference D, AC/OPS/CJFAC/OSJX/CH/33-0613, *AIRCOM JFAC handbook*.

information flow between the CCs. The ALE assists in coordinating air component activity in relation to its host component. It has a broad range of expertise and its responsibilities include exchanging current intelligence and operational data, support requirements, coordinating the integration of requirements for ACM and any type of air power support.

2.31 **The maritime liaison element.** The maritime liaison element staff is a maritime staff element under the command of the maritime component command (MCC). It is located within the NCS/NFS JFAC HQ or DCDR-Air CS and acts as the representative of MCC. The overall role of the maritime liaison element is to integrate the maritime air plan with the air plan, thereby ensuring an effective and efficient joint execution of SACEUR's or the joint commander's OPLAN. Maritime liaison element staff serve as both the maritime component commander's primary representative to the CFACC and the maritime counterpart of the NCS/NFS JFAC HQ.

2.32 **The maritime coordination element.** In addition to the maritime liaison element, the maritime component can send a maritime coordination element to the NCS/NFS JFAC HQ combat operations division (COD). It contributes to the coordination of maritime component activities with the NCS JFAC HQ at the tactical level.

2.33 **The ground liaison element.** The ground liaison element (GLE) is a land staff element under the command of land component command (LCC). It is located within the NCS/NFS JFAC HQ or DCDR-Air CS and acts as the representative of the respective joint force land component command. The overall role of the GLE is to integrate the land plan with that of the CFACC, thereby ensuring an effective and efficient joint execution of SACEUR's or the joint commander's OPLAN. If required, LOs may be detached from various land sub-commanders to support the GLE staff.

2.34 **The battlefield coordination element.** In addition to the GLE, the land component can send a battlefield coordination element to the NCS/NFS JFAC HQ COD. It serves as an agent between the NCS/NFS JFAC HQ and the Corps HQ to ensure effective operational co-operation at the tactical level.

2.35 **The special operations liaison element.** The special operations liaison element (SOLE) is aware of the activities of special operations units in the engagement space and provides a special operations force presence within the NCS/NFS JFAC HQ. The SOLE coordinates, integrates, deconflicts, and synchronizes special operations force air, surface, and sub-surface operations with conventional air operations. The SOLE integrates throughout the NCS/NFS JFAC HQ, or appropriate air C2, staff cells and functional areas. Special operations need to be closely coordinated with air operations planning and execution to prevent friendly fire and ensure facilitating the achievement of mission objectives.

2.36 **The space liaison element.** The space liaison element (SLE) is a space staff element under the command of the CFSpCC which acts as the representative of the CFSpCC within the NCS/NFS JFAC HQ or DCDR-Air CS. The overall role of the SLE is to integrate the space plan with the air plan, thereby ensuring an effective and efficient joint execution of

SACEUR's or the joint commander's OPLAN. If required, LOs may be detached from various space sub-commanders to support the SLE staff.

2.37 **Additional liaison.** For all other tactical level force HQs, the same principle of employment and tasking of liaison elements applies.

Liaison with elements outside SACEUR authority

2.38 Other military forces, international organizations, other government agencies and NGOs may be conducting activities near or in areas of military operations, and LOs from these organizations to the CFACC or DCDR-Air may be appropriate. To the maximum extent possible, commanders should ensure that these organizations' activities and NATO military actions are integrated, complementary, or not in conflict; and establish coordination and mutual support mechanisms as needed to eliminate or mitigate conflict and support Alliance or coalition operations in the region. Mission participants, particularly in operations being conducted in conjunction with or near those of Allied or non-aligned nations, may provide LOs that work with the CFACC or DCDR-Air to ease coordination between forces and with governmental agencies in accordance with NATO policies and procedures.

Section 8 - Air operations coordination-, air support operations- and maritime air operations centre

2.39 **The air operations coordination centre.** The air operations coordination centre (AOCC) provides a C2 unit under the command of the CFACC or DCDR-Air, collocated with and an integral part of a land force or maritime task force. The AOCC supports the preparation and planning process of an operation. The AOCC does not perform current ops tasks. The AOCC provides air expertise and integrates the liaison and coordination functions relating to air operations, including, but not limited to counter-land and counter-maritime operations, coordination with AD assets such as mobile army organic AD units, coordinated air/space procedures, and airspace control. In addition, the commander of the AOCC provides ATO inputs to the NCS/NFS JFAC HQ or DCDR-Air CS and planning, coordination, execution, monitoring, and assessment of the land (or maritime) air portion of land (or maritime) operations. While the ALE sits at the upper tactical/operational level (LCC or MCC) and concentrates on the operational planning cycle (3 days and beyond), the AOCC's primary role is to coordinate current and future operations (within the ATO planning cycle) at the lower tactical level. Even though there is no direct C2 relationship between the AOCC and ALE, when the graduated readiness forces land commander (lower tactical level) assumes the role of combined force land component commander (CFLCC) (upper tactical/operational level) the collocated AOCC-land supports the incorporation of an ALE within the LCC as directed by the CFACC. For exercises/operations, the AOCC provides execution-level coordination of air operations in support of the appropriate component commander as an extension of a designated NCS/NFS JFAC HQ or DCDR-Air CS.

2.40 **The air support operations centre.** Minute-to-minute coordination and synchronization among the air and the land component within division-assigned engagement

space is vital to effective air-surface integration. If deemed appropriate by the CFACC or DCDR-Air and in coordination with the CFLCC, an air support operations centre (ASOC) can be created. The ASOC facilitates joint fires as well as near-real time airspace coordination and deconfliction. The ASOC, as a tactical level element, normally collocates with the joint fire support element within the senior tactical/operational land forces HQ as required (corps/division level). The ASOC is the principal coordination and air control agency performing current ops tasks; for example, control of air operations that directly support the land component within the airspace allocated to the division. The ASOC is an extension of the NCS/NFS JFAC HQ or DCDR-Air CS to which it is directly subordinated.

2.41 The ASOC processes include the following:

a. Allocation of attack aircraft to joint terminal attack controllers;

b. Handling immediate air support requests;

c. Coordinating the execution of scheduled and on-call close air support sorties, and coordinating manned/unmanned aircraft transiting through ASOC assigned airspace over the ground force commander's operational area;

d. When delegated the authority, the re-targeting/re-tasking/re-directing of airborne assets;

e. Updating targets; and

f. Launching of ground alert aircraft on call in support of the ground forces, as required.

2.42 The ASOC's configuration is flexible and can be task-organized to support a variety of tactical control requirements. Within its volume of assigned airspace, the ASOC coordinates other mission areas, air interdiction; intelligence; surveillance and reconnaissance; suppression of enemy AD; and PR. If an ASOC and AOCC are both utilized, close cooperation and positive deconfliction between the two is required.

2.43 **The maritime air operations centre.** The maritime component possesses a maritime air operations centre (MAOC) which is the planning and execution element for maritime air operations. It is subordinate to the MCC and can task organic air assets in direct support of the maritime component commander. The commander of the MAOC provides ATO inputs to the NCS/NFS JFAC HQ battle staff and planning, coordination, execution, monitoring, and assessment of the maritime air portion of maritime operations. A MAOC can be established within the static Allied maritime command HQ, within an existing organization of a troop

contribution ashore, or with the task force afloat, as determined by operational requirements.[34]

[34] Aviation which is organic to either the land or maritime components (e.g., attack helicopters and/or maritime/amphibious helicopters), should appear on the ATO as 'strip alert' with no specific missions or timing.

Chapter 3 - Air power employment

Section 1 - Introduction

3.1 The delivery of air power can be defined in terms of roles, missions, and sorties. This chapter introduces the principles of air power employment in a multi-domain environment. Furthermore, it explains the four broad, fundamental and enduring operational roles of air power that are used to achieve strategic, operational, and tactical level objectives (see Figure 3.1 for a schematic overview). These are:

- control of the air;
- attack;
- air mobility; and
- intelligence, surveillance and reconnaissance (ISR).

The four operational roles of air power underpin multiple (joint) missions which are generated to achieve the desired objectives. Due to their relative importance, two specific missions are also briefly discussed in this chapter:

- electromagnetic warfare (EW); and
- support to personnel recovery (PR).

However, these missions are not unique to the air component, and other components perform the same or similar activities to varying degrees. Finally, this chapter discusses air power employment options and the forces which might be made available for air operations.

Section 2 - Control of the air (counter-air operations)[35]

3.2 Control of the air is the primary role of air power as it shapes the area of operations (AOO) wherein friendly operations can proceed at the optimum place and time without prohibitive air interference, while providing force protection (FP). Gaining control of the air is not an end in itself, but is useful if it is exploited as a means to a greater end. Once a sufficient degree of control of the air has been achieved, joint forces can project military power where and when needed. However, control of the air is not a permanent state and has to be constantly fought for if it is to be assured. There are three levels of control of the air.

a. **Air supremacy.** Air supremacy is defined as: 'that degree of air superiority wherein the opposing air forces are incapable of effective interference.'

[35] Refer to Allied Joint Publication (AJP)-3.3.1, *Allied Joint Doctrine for Counter-Air Operations*, for details of counter-air operations, including offensive and defensive measures.

b. **Air superiority.** Air superiority is defined as that degree of dominance in the air battle of one force over another which permits the conduct of operations by the former and its related land, sea and air forces at a given time and place without prohibitive interference by the opposing force.

c. **Air parity.** Air parity is defined as that degree of control of the air where neither the Alliance nor the enemy can exercise decisive control of the air in either time or space.[36] During a condition of air parity, both friendly as well as enemy land, maritime and air operations may encounter significant interference by the opposing force. In a condition of air parity, neither side enjoys freedom of action within the air domain.

3.3 The required degree of control of the air is achieved through counter-air operations. This enables all friendly forces greater freedom of action, while minimizing their vulnerability to detection and attack. Counter-air operations include all actions taken by any component to gain and maintain control of the air using a variety of integrated weapon systems and sensors to counter adversaries including, but not limited to: aircraft; surface-to-air missiles; ballistic missiles; and air-, land-, or sea-launched cruise missiles. Counter-air operations may be offensive or defensive in nature, the balance between which is dependent upon the nature and stage of a campaign, the depth, density, and capabilities of an adversary's integrated air and missile defence system and the adversary's offensive air and missile capabilities.

3.4 **Offensive counter-air.** Offensive counter-air (OCA) operations consist of offensive operations to destroy, disrupt, or degrade adversary air and missile capabilities as close to their source as possible, both before and after launch. Such operations may be pre-planned or immediate and are conducted across adversary territory at the initiative of friendly forces. OCA is a synchronized effort which includes the capabilities from the joint force. OCA includes surface attack operations, air-to-air missions, and suppression of enemy air defences (SEAD).

a. **Surface attack operations** target aircraft, airfields, cruise and ballistic missile infrastructure, ground/sea/air-based launch platforms, supporting infrastructures and associated command and control (C2).

b. **Fighter sweep** is an offensive mission by fighter aircraft to seek out and destroy enemy aircraft or targets of opportunity in an allotted AOO.

c. **Fighter escort** is a protection mission that employs air defence (AD) aircraft to protect vulnerable and high value aircraft packages.

d. **SEAD operations** are designed to neutralize, destroy or temporarily degrade enemy surface-based AD by destructive and/or disruptive means.

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[36] This definition is a new proposed term and is being processed for NATO Agreed status (TTF 2018-0270).

3.5 **Defensive counter-air.**[37] Defensive counter-air (DCA) operations protect friendly forces and vital interests from air and missile attacks; it is synonymous with air and missile defence (AMD). DCA consists of all active and passive AD operations to detect, identify, intercept, and destroy or make ineffective, adversary air and missile forces attempting to attack or penetrate friendly airspace. The AMD commander integrates forces assigned to them and coordinates all AMD activities regardless of system ownership. AMD can be active or passive.

a. **Active air and missile defence.** Active measures taken against attacking forces to destroy or nullify any form of air or missile threat or to reduce the effectiveness of any such attack. It is achieved through integrated detection, identification, assessment, interception, and engagement and is usually characterized by layered defence-in-depth, allowing multiple engagement opportunities, utilizing both airborne and surface-based AD assets, including those dedicated to missile defence.

b. **Passive air and missile defence.** Passive measures taken for the physical defence and protection of personnel, essential installations and equipment to minimize the effectiveness of air and/or missile attack. Elements of passive AD include early warning; camouflage, concealment, and deception; hardening; dispersion; reconstitution, and low observable or stealth technologies. Passive AD measures do not involve the employment of weapons, but improve survivability. Passive AD measures for survivability of the joint force are part of the overall FP posture.

Section 3 - Attack

3.6 Attack lies at the heart of air power's capacity to create effects. Air attack is coercive in the broadest sense of the term as it creates effects to achieve tactical, operational and strategic objectives through the use of force. The Alliance uses air-attack capabilities to target adversaries through strategic attack, and counter-surface force operations.

3.7 **Strategic attack.** A strategic attack is a strategic level-directed offensive action against a target that is specifically selected to achieve strategic objectives. Strategic attack aims to weaken the adversary's ability or will to engage or continue in conflict and as such, could be part of a campaign or operation, or be conducted independently as directed by the Alliance. Additionally, these attacks may achieve strategic objectives without necessarily having to achieve operational objectives as a precondition. Suitable targets may include, but are not limited to, an adversary's centre of gravity. A key advantage of air power, over many other elements of military power, is the ability to strike the adversary directly, disrupting critical

[37] Includes anti-air warfare (AAW). AAW operations are conducted to defend a maritime force against attack by airborne weapons launched from aircraft, ships, submarines and ground-based sites. AAW aircraft may be either ground-based or sea-based and, depending on the tactical situation, may be ordered to maintain ground/deck alert or on combat air patrol (AJP-3.3.3, *Allied Joint Doctrine for Air-Maritime Coordination*).

leadership functions, conflict-sustaining resources and strategy, while avoiding the need to sequentially fight through layers of surface forces. The expected effects, not the specific weapon systems, delivery platform, or the type of target attacked, define strategic attack.

3.8 **Counter-surface force operations.** Counter-surface force operations are air operations conducted to defeat adversaries' surface forces; destroy their supporting infrastructure; or generate psychological effects to shatter their cohesion or will to fight. They consist of counter-land or counter-maritime operations.[38]

a. **Counter-land operations.** How counter-land operations are conducted is dependent on the joint campaign strategy and the specific circumstances of the conflict; factors include an adversary's disposition, the phase of the operation, whether surface combat is also occurring, the degree of control of the air held, and the need to support, or be supported by, surface forces. Operations generally fall under two mission types: air interdiction (AI) and close air support (CAS).

(1) **Air interdiction.** AI operations are those conducted to dislocate, disrupt, delay, degrade or destroy an adversary's military potential before it can be brought to bear effectively. Their distance from friendly forces is such that detailed engagement space deconfliction with the land component is not essential. However, their activities and effects should be synchronised, if conducted as part of a deep operation. AI is flexible and can provide support to surface operations or can be used as the main effort against the adversary surface force without the presence of any friendly ground forces (or with discrete ground force elements providing target cueing). Thus, it may offer the potential to reduce the requirement for surface combat. AI may use strike coordination and reconnaissance missions, utilizing combat aircraft to detect targets for AI missions in a specific geographic zone.[39]

(2) **Close air support.** CAS operations are conducted against adversary forces/military objectives that are in close proximity to friendly forces and which require detailed coordination for fire and movement, friendly fire avoidance and terminal attack control performed by joint terminal attack controllers or forward air controllers (airborne). CAS provides ground or amphibious forces with fires during offensive and defensive operations to deter, destroy, suppress, neutralize, disrupt and fix or delay adversary forces. Aircraft can make an immediate and direct contribution to the surface battle, especially against targets that are either inaccessible or invulnerable to available surface weapons

[38] While air power traditionally supports the land and maritime components, air power can also contribute to space and cyberspace operations, for example by targeting fixed infrastructure or an adversary's use of the electromagnetic spectrum.

[39] Refer to AJP-3.3.2(A), *Allied Joint Doctrine for Close Air Support and Air Interdiction,* for details of strike coordination and reconnaissance missions supporting air interdiction.

effects. The variety of targets likely to be encountered makes it important to be able to employ a variety of weapons and delivery systems, thus interoperability and standardization of procedures are paramount.

b. **Counter-maritime operations.**[40] Counter-maritime operations extend the application of air power into the maritime domain. Air operations are typically flown in support of friendly maritime forces as part of air-maritime coordination operations. However, they may also be conducted independently or when no friendly forces are in the area. Such operations usually contribute to the following specific maritime warfare areas.

(1) **Antisurface warfare.** Antisurface warfare (ASUW) operations are conducted to destroy or neutralise adversary maritime surface forces or to defend against surface opponents. ASUW operations should ensure the timely detection and engagement of an adversary's surface forces so as to deny their effective employment. The area of attack and other factors that influence tactics, weapons mix, and support requirements should be clearly identified and primary targets should be specified, especially when surface combatants are escorting amphibious warfare and logistic units.

(2) **Antisubmarine warfare.** Antisubmarine warfare (ASW) operations are conducted with the intention of denying the adversary their effective use of submarines. ASW includes searching, locating, tracking, classifying and attacking submarines as well as their support assets.

(3) **Aerial mining.** Aerial mining operations are conducted to maintain control of important sea areas by damaging adversary vessels, restricting adversary maritime manoeuvre and generally preventing the flow of traffic in a certain area. Aircraft, by their nature, may be the most suitable vehicles for offensive mine laying operations and for replenishing existing fields.

Section 4 - Air mobility

3.9 Air mobility enables the deployment, sustainment, and recovery of military and civilian personnel and materiel by air. It is critical to the success of joint operations. The speed and responsiveness of air mobility provides political flexibility, thereby offering options to create immediate strategic influence. Air mobility operations fall into two fundamental categories: air transport (AT) (sometimes referred to as airlift) and air-to-air refuelling (AAR).[41]

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[40] Refer to AJP-3.3.3, *Allied Joint Doctrine for Air-Maritime Coordination,* for details on counter-maritime operations.

[41] Note that a single air mobility aircraft may have the capability to conduct passenger, freight and AAR missions concurrently.

3.10 **Air transport.** AT enables the movement and sustainment of forces anywhere in the world and across the entire range of operations. It provides rapid and flexible mobility options to military, national, and governmental agencies to quickly respond to various crisis situations worldwide. Payloads are delivered via two methods: air land or airdrop.

a. **Air land** delivery occurs when an aircraft lands and unloads its payload. Air land, as opposed to airdrop, is the preferred method of delivery when conditions permit. Compared to airdrop it minimizes the risk of injury to personnel and damage to equipment, eliminates payload dispersal, and offers an increased availability of resources.

b. **Airdrop** is the delivery of personnel and/or materiel from an aircraft in flight to a drop zone. This method is used when landing is not possible, either because of a lack of an appropriate landing site or because of the tactical situation.

3.11 **Types of air transport operations.** AT operations are typically classified as inter- or intra-theatre.[42]

a. **Inter-theatre AT** provides the air bridge that links theatres to home bases and/or other theatres. Given the ranges usually involved, inter-theatre AT is normally comprised of AT aircraft operating in the strategic role or civilian aircraft, but may be augmented by AT aircraft operating in the tactical role if/when required.

b. **Intra-theatre AT** provides air movement within a specific theatre or joint operations area (JOA) and is normally fulfilled by AT aircraft operating in the tactical role or support helicopters capable of operation under a wide range of tactical conditions, including small, austere field operations. Intra-theatre fixed-[43] and rotary-wing/tilt-rotor[44] air assets provide time-sensitive AT to a commander, and enable the conduct of air manoeuvre operations, including the air delivery of combat power.

3.12 **Air-to-air refuelling.**[45] AAR is an air support operation consisting of the in-flight transfer of fuel between tanker and suitable receivers. AAR is an essential capability that

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[42] There are several types of air transport operations. For further details refer to Allied Tactical Publication (ATP)-3.3.4, Volume I, *Air Transport (AT) Doctrine and ATP-3.3.4 Air-To-Air Refuelling (AAR) Doctrine*.

[43] Almost any aircraft could give support to intra-theatre activity. Essentially, most intra-theatre flights are normally flown by fixed-wing aircraft, while some restricted or particular flights may be executed by fixed- and rotary-wing aircraft. It is essential to take into account that aircraft performance characteristics will be affected by some factors such as flight obstacles, runway length, gross weight and atmospheric conditions. Rotary-wing and tilt-rotor assets are generally assigned as combat and combat support elements to surface combat groups.

[44] For planning purpose, a commander should plan fixed-wing vs rotary-wing/tilt-rotor: to sustain AT operations beyond about 100 nautical miles; taking into consideration that rotary-wing airframes usually require more maintenance hours per every hour of flight time; and, considering suitable landing zones which maximize the effectiveness of AT operations.

[45] There are several types of AAR operations. For further details refer to ATP-3.3.4 Volume I, *Air Transport (AT)* Doctrine and ATP-3.3.4, Volume II, *Air-To-Air Refuelling (AAR) Doctrine.*

increases the range, endurance, payload,[46] and flexibility of all capable receiver aircraft, and is especially important when forward basing is limited or unavailable. The high demand placed on AAR assets makes effective employment critical. AAR enhances the ability of air power to achieve surprise by allowing indirect approaches and multiple axes of attack. AAR also maximizes the use of each combat/combat support asset launched by increasing flight time or on-station time. AAR assets are considered high-value air assets and should be defended appropriately.

Section 5 - Intelligence, surveillance and reconnaissance

3.13 Air power's contribution to joint intelligence, surveillance and reconnaissance (JISR) fuses planning and operations tasks to integrate joint intelligence requirements with air ISR collection capabilities along with the associated processing, exploitation, and dissemination required to turn the data collected into actionable intelligence. The results of the air ISR process can support planning, preparation, execution and assessment of joint operations.[47] Air- and space-based ISR assets can be used to strategically build an early understanding of crisis points and enhance the quality of political and high-level military decision making. At the operational and tactical level, it enables observation of an adversary's actions and dispositions (including battle damage assessment), thereby enabling commanders to identify dependencies, vulnerabilities, and strengths. ISR consists of three linked "inform" functions.

a. **Intelligence.** Airborne assets do not directly deliver intelligence but provide timely, accurate, and relevant data and information that is processed, disseminated and potentially fused with other sources of information to provide intelligence. Air power usually supports the following intelligence collection disciplines: acoustic intelligence, imagery intelligence, measurement and signature intelligence, and signals intelligence (SIGINT).

b. **Surveillance.** Surveillance is the continuing and systematic observation of a wide area of interest, whether in the air, space, land, or maritime domain. The area of interest may be observed by visual, aural, electronic, photographic or other means; however, surveillance is not usually orientated towards a specific target but designed to provide indications and warning of adversary initiative and to detect changes in adversary activities. Airborne and space-based surveillance assets exploit elevation to do this, usually at long range.

c. **Reconnaissance.** Reconnaissance is a mission undertaken to obtain, by visual observation or other detection methods, information about the activities and resources of an adversary or potential adversary, or to secure data concerning the meteorological, hydrographic, or geographic characteristics of a particular area.

[46] The availability of AAR may allow an aircraft to launch with a greater weapon load at the expense of fuel load.
[47] Further detail is contained within AJP-2.7, *Allied Joint Doctrine for Joint Intelligence, Surveillance and Reconnaissance*.

Reconnaissance generally has a time constraint associated with tasking or the endurance of assets involved. Intelligence critical to the prosecution of current operations is derived from reconnaissance operations and should be evaluated and transmitted in near real time to those elements needing that information. The speed offered by aircraft makes them amongst the most responsive of ISR platforms and their reach gives them the ability to cover large areas, collecting information from a variety of sensors (radar, acoustic, imaging and signals). Crews are trained to recognize and respond to changing conditions by modifying operating modes as dictated by the operational circumstances, then share information through voice or data link. Aircraft, when appropriately tasked and supported, can offer a significant persistent ISR capability capable of distributing large volumes of information in real time or near-real time.

3.14 Air power ISR capabilities, as with the broader JISR approach, are focused around six key principles: centralized direction with decentralized execution; responsive; accessible; sustainable; reliable; and accurate. However, the effectiveness of ISR sensors can be reduced by adverse weather conditions and the use of camouflage and concealment techniques. These limitations can be overcome by using a broad spectrum of sensors on a variety of aircraft or by fusing JISR results with other information or intelligence.

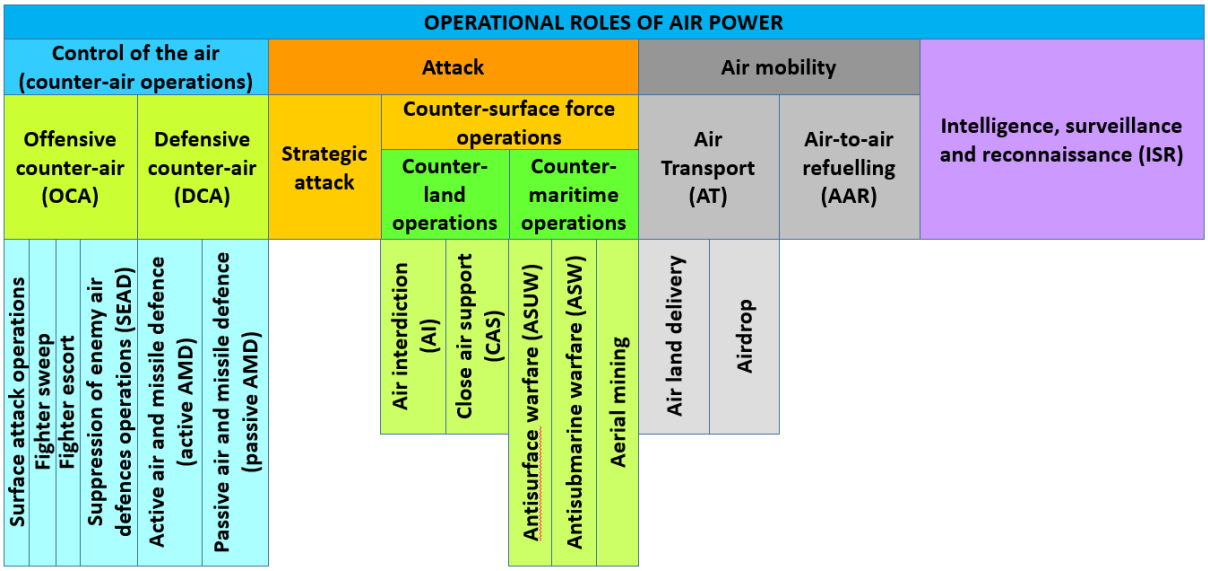

Figure 3.1 – Operational roles of air power

Section 6 - Key air power enablers

3.15 The ability to deliver each of the four roles of air power is dependent on four critical enabling functions: base; sustain; connect; and protect. Flexible basing options enable rapid effects to be created across a theatre, whilst air logistics enable the sustainment of operations. Command, control, communications, computers and information systems (C4IS) enable connectivity and FP capabilities enable the protection of forces in the AOO.

a. **Base.** Air power can operate from a range of basing options, providing maximum agility for operations. Basing options include home basing, mission participants' bases, sea basing and forward land basing. Each has different access constraints in terms of staging, overflight, FP requirements and sustainment, and each can provide different options when projecting air power.

(1) **Home basing.** Home basing enables air power to protect national territory and respond to crises almost immediately without the need for deployed logistic or host-nation support. Provided the threat to the airbase from an adversary can be mitigated, well-founded home bases remain the preferred choice for generating air power, especially for participation in large-scale sustained air operations.

(2) **Mission participants.** Maintaining good relations with mission participants enables the potential to operate from their sovereign territories in support of NATO objectives. Using such bases can significantly expand the reach of air power but is reliant on maintaining good relations with the host nation.

(3) **Sea basing.** The sea basing of aircraft enables global reach and the ability to act unilaterally with reduced dependency on staging or overflight permissions. Ships are able to loiter in areas of tension to deter adversaries, react to events or reassure our allies.

(4) **Forward land basing.** If access can be gained to, or near to, an adversary's territory and a basing option secured, it can enhance the speed of response, persistence and concentration of support for land forces. However, it is dependent on the available infrastructure to support the aircraft type, FP and the ability to maintain control of the air in the vicinity of the base.

b. **Sustain.** Sustainability enables air power force elements to deploy to an AOO and remain fully mission capable for a variety of roles. It provides the flexibility to remain on task and operationally capable for as long as necessary. Air logistics is the ability to plan and execute the movement, maintenance, and sustainment of air power.[48] Providing a variety of logistic functions is a complex, dynamic and wide-ranging series of disciplines that can often dictate the operational tempo. In general, responsive engineering and supply offsets aircraft fragility, high levels of equipment availability counters the cost of massing air assets, and rapid mobility and enabling can offer new basing options and the ability to rapidly enact air operations at reach. However, air logistics can also form a vulnerability due to its inherent complexity and

[48] See Allied Logistics Publication-4.3, *Allied Air Forces Doctrine for Logistics* for further details.

the wide-spread supply base that is susceptible to physical, cyberspace, commercial and even political disruption.

c. **Connect.** Generating aircraft for air operations invariably depends upon the collaborative working, in near real time, of geographically disparate users. Moreover, effective air C2 cannot be delivered without a robust C4IS solution, irrespective of where the air commander and their staff are located. Information exchange, enabled through data links at the tactical and operational levels, enables force survivability, shared situational awareness and, ultimately, information advantage. All of these are critical to mission success in any complex, contested engagement space.

d. **Protect.** Air power projection relies on the protection of a network of operating bases, people, aircraft, C4IS networks and logistical nodes. Aircraft are scarce, expensive and fragile, and either operate from relatively large, static bases that are difficult to disguise, or from small, remote forward operating bases or forward arming and refuelling points. FP is required to ensure the freedom of action to operate from such bases. A high-readiness FP capability at the outset of an operation secures operating bases and enables the deployment of air power. Subsequent air operations are protected through coordinated activities and measures, both on the operating base and within any assigned ground defence area, established beyond the airbase perimeter. Air FP measures fall into four broad categories, which are: active defence; passive defence; recuperation; and security.[49]

Section 7 - Electromagnetic warfare

3.16 Access to the electromagnetic environment (EME) is a key enabler across all the roles of air power. EW activities aim to assure freedom of action across the electromagnetic spectrum (EMS) whilst denying an adversary such freedoms. It includes: electromagnetic defence (ED) to assure freedom of action for friendly forces; electromagnetic surveillance (ES) to enable us to understand the enemy systems, communication and navigation limitations, or exploitable opportunities throughout the EME; and electromagnetic attack (EA), which can increase the scope of available strike options, including that of non-lethal action. EA may be more politically acceptable when considering the pervasiveness of information via social media and the political risk of collateral damage caused by lethal weapons. At the operational level, airborne EW activities fall into two fundamental categories: enable and support.

3.17 **Enable electromagnetic activities.** Airborne enable activities shape the EME to allow NATO forces to exploit the EME. Activities include, but are not limited to:

[49] See ATP-3.3.6, *NATO Force Protection for Air and Ground Based Space Activity* for further details.

a. Targeting and destroying enemy positioning, navigation, and timing (PNT) jammers to allow NATO forces to use precision guided munitions;

b. Countering enemy ES and SIGINT collection systems to prevent interception of NATO electromagnetic emissions; and

c. Identifying, geolocating if possible, targeting, and striking enemy jamming assets targeting NATO communication systems.

3.18 **Support electromagnetic activities.** Airborne support activities can provide situational awareness of the EME to allow NATO forces to manoeuvre in the EMS as well as directly support joint operations. Activities include, but are not limited to:

a. Characterising/geolocating electromagnetic signals through airborne/ground-based geolocation systems;

b. Triangulating emitters based on EME signal intercepts;

c. Acting as communications links between geographically remote friendly land forces;

d. Using EA capabilities to jam enemy sensors and prevent detection of friendly forces; and

e. Protecting friendly ground forces by performing ED to disable radio-controlled improvised explosive devices.

Section 8 - Support to personnel recovery

3.19 PR encompasses all military, diplomatic and civil activities to affect the recovery and reintegration of military or civilian personnel who are separated from their unit or organization in a situation that may require them to survive, evade, resist exploitation, or escape while awaiting recovery. Since PR is a joint effort, coordination between the joint and component levels are essential. To this aim, a joint personnel recovery centre (JPRC) and personnel recovery coordination cells (PRCC) are to be established at the appropriate levels. A JPRC provides the information that goes into the PR portion of the air tasking order (ATO) special instructions. Furthermore, the joint force air component should ensure the ATO includes air assets sufficient to accomplish PR tasks. A PRCC, if needed, will act as a link between forces and the PR command chain during the execution phase.

3.20 PR missions range from recovering a survivor using a single aircraft to multiple units from different services which may involve a variety of forces including C2, CAS, SEAD,

intelligence, airborne early warning, medical evacuation, EW, psychological operations and special operations forces assigned to a PR task force.[50]

Section 9 - Air power employment options

3.21 The increased complexity of modern warfare requires NATO to be able to fight as a joint force in a contested operating environment to create desired effects at the strategic, operational, and tactical levels. Coordination, control, and exploitation of the air are critical to the success of operations. Since air operations include elements from all domains, it represents one of the strongest drivers for the integration of joint operations, including the capacity to conduct C2 of joint operations from the air.

3.22 Air power contributes to joint operations by gaining and maintaining the desired degree of control of the air. Conversely, air power relies on land, maritime, space, cyberspace, and special operations capabilities, which assist in intelligence collection, including support to targeting, attribution of actions, and confirmation of effects of air operations in the engagement space, in addition to the provision of critical infrastructure support. Strategic basing, strategic lift, AAR, and maritime manoeuvre and mobility enable the deployment and sustainment of joint forces at strategic distance and enable the exploitation of air attributes.

3.23 The ability to understand and therefore operate effectively in cyberspace is essential in modern warfare. Air operations increasingly rely upon modern, resilient, multi-level information networks, which could be challenged by state and non-state actors. Increased reliance on cyberspace capabilities may present vulnerabilities for adversaries to affect this critical enabling capability through cyberspace or via lethal and/or non-lethal activities. Commanders and their staffs should take into consideration that air power may not always be sufficiently robust and resilient to operate in a degraded or disrupted cyberspace.

3.24 There are strong dependencies between air operations and national space-based capabilities, even though NATO neither owns nor controls them. Air power relies upon multiple functions provided by space assets, including but not limited to early and timely warning, ISR, satellite communication, and the provision of PNT, as well as geospatial and meteorological and oceanographic information. This air-space dependency requires air operations to consider the space domain, in particular the vulnerabilities of space-based systems. Commanders and their staffs should appreciate that air power may be significantly less employable with degraded or no space support. Space requirements and vulnerabilities are essential elements to be considered during the planning of NATO operations and may become drivers for capability development.

3.25 In terms of actions and effects, particular care needs to be applied to the use of air power in counterinsurgency and similar type operations. The synergy of air assets and surface forces, operating as an integrated joint force, can often be overwhelming in cases

[50] See AJP-3.7, *Allied Joint Doctrine for Recovery of Personnel in a Hostile Environment* for further details.

where a single component cannot be decisive by itself. However, there can be a temptation to use air power principally as a source of lethal actions. Commanders must realise that the use of air power solely in connection with destructive action can be overused. The ability to cover great distance at high speed, be at instant readiness for action, and present a relatively low risk to Allied personnel can combine to encourage offensive use more often than the occasion warrants. Perceived excesses may undermine strategic messaging and sway audiences against the legitimacy of the campaign. It should also be noted that air power offers a range of effects that extends well beyond destructive force. Increasingly, air assets are equipped with sensors and communications systems that can contribute to broader component and joint force understanding.

3.26 Within the contemporary operating environment, air power employment options include the following.

a. Preserving peace and strengthening international security through the promotion of good international relations and the provision of reassurance to nations by.

(1) Promoting international relations through speed of response to natural disasters such as earthquakes, tsunamis, flooding and famine. This can also potentially generate a spirit of goodwill, help to remove suspicion, alleviate grievances, and promote stability and security.

(2) Providing reassurance to build confidence and security by preventing increased international tensions. Air operations, and air surveillance activities can provide assurance that an adversary is not about to attack.

(3) Providing and supporting military training and exercises. Advising and assisting mission participants' air forces can build expertise, capabilities, and enhance interoperability.

b. Managing crises can be supported by offering a wide variety of important air power applications, many of which involve no recourse to violence. In terms of increasing seriousness these may include:

(1) Monitoring indications and warnings of intended aggression (often without being detected) to enable appropriate preventative action;

(2) Signalling clear political intent through a range of measures from overt increases in readiness, intensified peacetime training and exercises, or presence flights;

(3) Moral and physical support to mission participants to strengthen their resolve in times of tension;

(4) Rescue or evacuation operations in crisis situations;

(5) Stabilisation through the airborne insertion of personnel into a region threatened with civil strife or where regional conflict threatens to spill over into neighbouring states/territories;

(6) Explicit deterrence through the deployment of air reconnaissance or surveillance assets to warn a potential adversary that their actions are being watched and could provoke a response;

(7) Explicit deterrence through rapid incursion deep into an adversary's territory to demonstrate that their homeland cannot be kept safe from attack;

(8) Non-lethal coercion to deter a potential aggressor, without resort to lethal actions, by the rapid and overt deployment of combat air assets to a region; and

(9) The conduct of strategic attack operations, noting that these operations depend on surprise for their effect.

c. Warfighting may see air operations concentrated in time and space during frequent, widespread, and intense combat operations that may include.

(1) Destruction through the ability to concentrate decisive destructive fires.

(2) Lethal coercion through air activities deep into adversary territory to observe and engage critical targets to coerce an adversary. An adversary that faces strong joint air forces has to accept the possibility that NATO can escalate the scale and scope of the conflict rapidly, and at will, by extending the intensity and range of their attacks.

(3) Denial or containment to limit the abilities of an adversary to employ air, surface, and sub-surface forces effectively or to contain them within a geographic area.

(4) Dislocation through destruction of (or damage to) a target, may cause the adversary major psychological and physical dislocation. Dislocation causes delay and confusion, breaks unit cohesion, and may make an adversary more vulnerable to follow up attacks by all types of forces.

(5) Diversion of adversary forces to delay or destroy them. At the strategic and operational levels, diversion can be achieved by concentrating attacks against sensitive targets, compelling an adversary to divert forces and resources from offensive to defensive duties. At the tactical level air forces can achieve diversion by selectively observing or attacking choke points such as bridges.

(6) Delay through the effects of dislocation, destruction, or diversion on an adversary’s forces to allow friendly forces to prevent an adversary’s escape in

offensive situations, or to deal more effectively with an attack, either by strengthening defences or by launching spoiling attacks.

(7) Demoralisation is a factor that pervades all aspects of combat capability and air forces have generally been perceived to have had a sapping effect on morale, often simply by its presence, almost irrespective of the damage inflicted.

Forces available for air operations

3.27 Whether functioning as the supported or the supporting command[51] (as designated by Supreme Allied Commander Europe), air operations are rarely executed solely by air component forces. Organic air capabilities and/or assets assigned or attached to other components may be made available for joint tasking[52] for air operations after consultation with the component commanders concerned and at the direction of the joint commander. Tasking of these assets is in accordance with the joint commander's air apportionment decision. The joint commander's apportionment decision is based on the Combined Force Air Component Commander's (CFACC's) recommendation.

3.28 Air operations do not necessarily include air capabilities and assets organic to another component and which are used by that component solely in pursuit of its own operations to accomplish its assigned mission.

3.29 The joint commander integrates the actions of assigned, attached and supporting forces within the JOA; however, to maximize operational effectiveness and avoid duplication of effort, the CFACC synchronizes and integrates the actions of assigned, attached and supporting air capabilities and assets in time, space and purpose. The CFACC exploits the characteristics of all air assets made available for tasking to create desired effects as rapidly and as effectively as possible.

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[51] The execution of joint operations is often guided by the supported/supporting relationship when one force should aid, protect, complement or sustain another force to the best effect. This relationship of the supported and supporting commander provides the means of balancing the phases of Alliance operations between NATO commanders receiving support from, and providing support to, other commanders.

[52] Command relationship. Combined Force Air Component Commander will typically exercise tactical control and tactical command over NATO forces made available for joint air tasking by other component commanders.

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Chapter 4 - Planning and tasking of air operations

Section 1 - Planning of air operations

4.1 NATO uses operational estimates which formulate objectives to be achieved and identify critical operational requirements, limitations on freedom of action and inherent risks. They are driven by strategic assessments, direction and guidance, and are further influenced by operational estimates, the comprehensive understanding of the operating environment,[53] as well as advice from subordinate commands and cooperating organizations.

4.2 The operational estimate is a decision-making process which is applied to structured problems in uncertain and dynamic environments against shifting, competing or ill-defined goals, often in high stakes, time-pressured situations. In most cases, the Commander Allied Air Command (COM AIRCOM) forms an air operations planning group following NATO's operations planning process to produce one or more courses of action (COA).

4.3 When the joint commander approves the COM AIRCOM COA, it becomes the concept of air operations - expressing what, where and how air operations will be employed against the adversary or to address the current situation - articulated as the air plan.

4.4 COM AIRCOM's role is to provide focus, guidance, direction, and purpose to their staff. During planning, their entire staff is used to explore the full range of probable and likely adversary and friendlies COAs. Planning is conducted in a collaborative manner with other components by making maximum use of appropriately empowered liaison elements.

4.5 Planning is a continuous process that only ends when the mission is accomplished and the forces are redeployed, or when the national command authorities terminate the mission and direct the redeployment of forces. The staff should include representation from all components to enable coordination and greater understanding of all component capabilities or forces. Throughout the process, COM AIRCOM needs to expect changes and be ready to solve them in a time-constrained environment.

Section 2 - Strategic communications considerations for conducting air operations

4.6 Narrative-led execution allows the Alliance to align its actions and words, from the lowest level of command to the North Atlantic Council (NAC); continuously reinforcing NATO's strength of purpose to our targeted audiences. An unclear end state, objectives, actions, words or apparent discrepancies and contradictions may suggest the Alliance's position is not firm and will allow adversaries to attack NATO's cohesion. The deterrence narrative expounds on the principles of credibility, capability and comprehension, with the

[53] See the *Comprehensive Operations Planning Directive 3.0.*

focus shifting between these principles depending upon the type of deterrence being undertaken. This ensures that: audiences understand the capability and credibility of the Alliance's fighting power; audiences attribute malign activity correctly; and mission participants are reassured, whilst minimizing the risk of misunderstanding. Effective communication is the first phase of deterrence, aiming to persuade a stakeholder not to become an adversary in the first place. Commanders and their staffs need to be fully aware of how to leverage the informational aspects of military activities, especially those involving the use of force, to communicate strategically and influence perceptions of key audiences and relevant actors.

4.7 Poorly planned or coordinated strategic communications (StratCom)[54] may undermine Alliance unity and resolve based on the public opinion of national populations. To protect Alliance cohesion and preserve a commander's freedom of action, it is crucial that the Alliance's StratCom objectives guide planning and activities among the staff and at all levels within the chain of command. This enables a commander to maximize the communicative effect of plans and activities while preparing for, and minimizing, the utility of an adversary's information campaign.

4.8 Air platforms are often uniquely able to provide demonstrations of capability and precision targeting to support campaign messaging at a speed of relevance as well as providing humanitarian stories that message NATO's values. When mistakes occur, NATO must be prepared to be 'first with the truth' and counter any adversarial messaging that will be generated.

Section 3 - Campaign synchronization during operations

4.9 The joint coordination process synchronises the campaign activities of a joint force within a joint operations area (JOA). The primary objective of joint coordination is to provide the most effective use of joint force assets and to capitalize synergy. The joint commander establishes or may delegate a subordinate commander to establish a joint coordination board (JCB) organization within their staff to accomplish campaign synchronization and joint coordination. The JCB and its subordinate working groups and/or elements all contribute specific inputs to the campaign synchronization process. These subordinate working groups and elements include: the information activities coordination board (IACB), the joint defended asset working group, the assessment board, the joint targeting coordination board (JTCB), the joint operations planning group, and the joint collection management board (JCMB). Effective communications and liaison are vital to its success.

4.10 The JCB should have a macro-level view of the JOA and seek to accomplish campaign synchronization and joint coordination approximately 3-10 days out. This synchronization includes consideration of joint targeting guidance and balancing competing component

[54] For further details see Allied Joint Publication (AJP)-10, *Allied Joint Doctrine for Strategic Communications*.

requirements with the joint commander's direction and guidance. It issues a joint coordination order (JCO) as required on behalf of the joint commander.

4.11 The JCO provides, in one document, the overall operational focus of the campaign for a certain period, showing the interaction of all forces and capabilities, both lethal and non-lethal, that the joint commander has available to complete their mission. The JCO states the joint commander's intent, desired effects and main point of effort. It also provides amplifying guidance, coordinating instructions, supporting/supported relationships (synchronization matrix) and command and signal. It includes annexes for the joint prioritized target list (JPTL), joint prioritised defended asset list, information objective matrix, time-sensitive target (TST) matrix, intelligence surveillance and reconnaissance (ISR) time critical collection matrix, civil-military cooperation plan, and updated commander's critical information requirements.

4.12 Based on the draft JCO, component commanders develop their own objectives and tasks, including requests and/or recommendations to the Combined Force Air Component Commander (CFACC) or Deputy Commander Air (DCDR-Air) for the proposed apportionment of air assets. These are then submitted to the joint commander's JCB for review and concurrence. The JCB resolves any case of conflicting component objectives.

Section 4 - Air battle rhythm and air tasking cycle

Air tasking cycle

4.13 Based on events within the joint battle rhythm, the air battle rhythm[55] is developed to reflect and serve the requirements of the joint headquarters (HQ). The air battle rhythm provides guidance to the NATO Command Structure (NCS)/NATO force structure (NFS) joint force air component (JFAC)[56] for key planning and tasking events, specifically: the chairperson, participants, location, standard agenda with dedicated speaking time, and required products or contributions. It schedules the planning, coordination, direction, and guidance for these events. NFS JFAC HQ's can adapt the processes and structure of their staffs as necessary.

4.14 The CFACC uses the air operations planning process to efficiently plan, coordinate, allocate, task and employ joint air capabilities under the guidance of the joint commander. The cycle shall be flexible enough to react to changes, including changing tactical situations, changing operations tempo, new guidance from the joint commander, and additional requests for support from other component commanders. The joint air tasking cycle translates joint ISR and joint targeting guidance into an actionable air plan. Much of the routine air operations planning process is conducted through an interrelated series of information exchanges and parallel planning activity. Designated component liaison officers and/or messages provide a means of requesting and scheduling joint air missions. A timely release of the air tasking

[55] For details: see Reference D, AC/OPS/CJFAC/OSJX/CH/33-0613, *AIRCOM JFAC handbook* page 58-62.
[56] When delegated, the DCDR-Air and their combined staff, can also perform these duties or parts of it.

order (ATO) and airspace control order (ACO) is critical to allow other components to conduct planning.

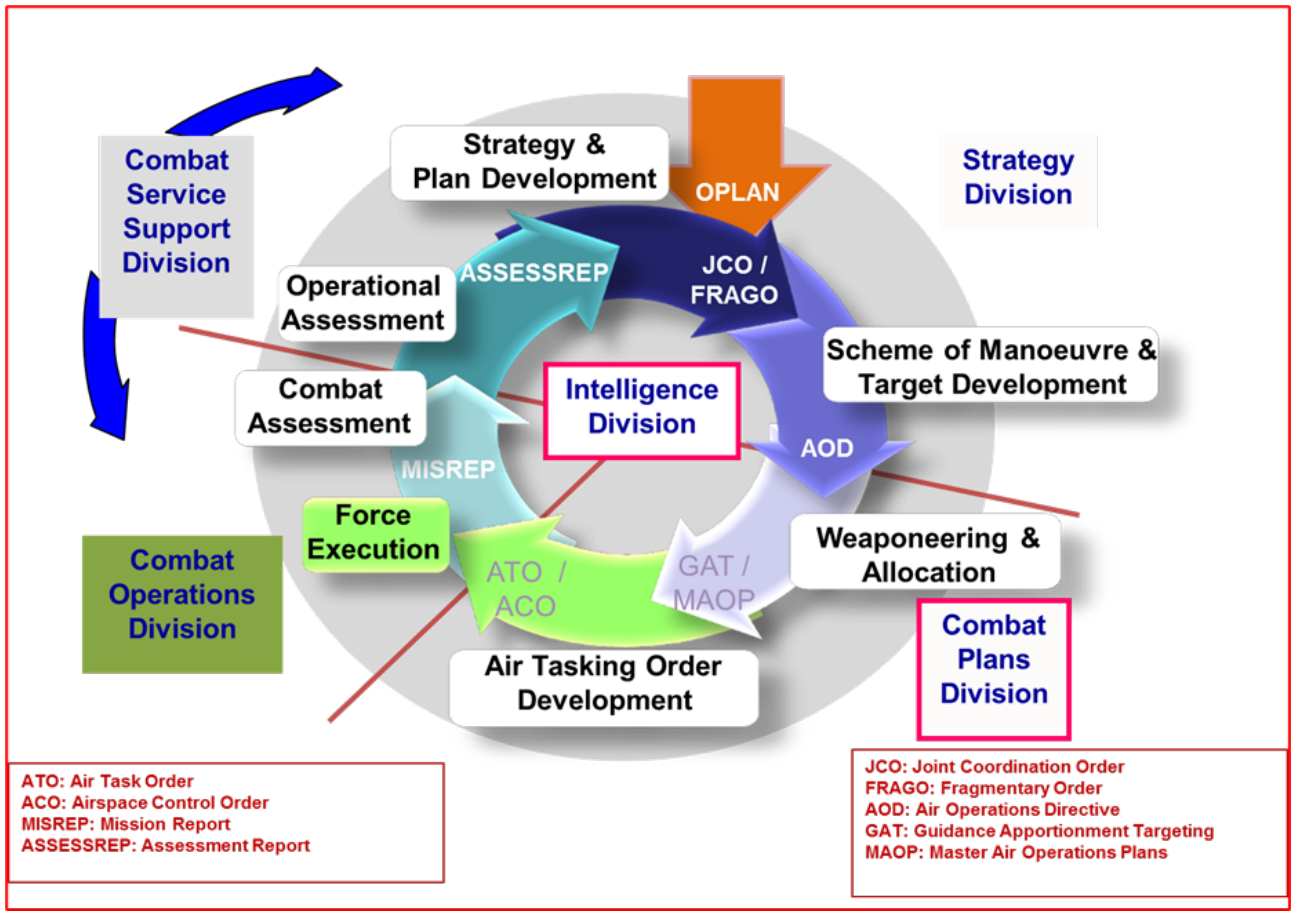

Figure 4.1 – The air tasking cycle

4.15 The ATO articulates tasking for air operations for a specific time, normally 24 hours. Detailed planning takes place within a predetermined and recurring schedule. Because of the finite period covered by an ATO, there are typically several ATOs in various stages of development at any one time. Long-endurance missions should be reflected in sequential ATOs. The air tasking cycle starts with the joint commander's guidance and ends after the assessment period. Long-range combat air assets or long endurance ISR assets launching from outside the JOA, may be airborne before ATO execution. These assets require the most current ATO (and ACO) information and updates available. The targeting cycle matches dedicated targets with the capabilities or forces made available to the CFACC for the given ATO. The number of air tasking cycle phases may vary based on theatre and contingency requirements, but usually consists of the following phases.

Phase 1 – Strategy & plan development

4.16 The main activity within phase 1 is translating the joint commander's direction and guidance (D&G) into related air power contributions to the operation plan. The process includes the development of recommendations for appropriate changes of the air operations directive (AOD), the development of the CFACC's comments and apportionment recommendations on the draft JCO based on the air strategy concept and the adaptation of the strategy to task (STT)[57] matrix. All three products are submitted to the CFACC during the air strategy meetings for the CFACC's approval and D&G.

Phase 2 – Scheme of manoeuvre & target development

4.17 The main activities within phase 2 are the identification of actions to match desired effects based on the JPTL and air prioritized target list (PTL), the adaptation of the joint prioritized defended asset list (JPDAL); and the finalization of the AOD. These processes take place in close coordination with other component commands (CC) and the joint HQ. The main products from phase 2 are the approved AOD, AOD changes and the air-JPDAL.

Phase 3 – Weaponeering and air allocation

4.18 **Weaponeering.** Phase 3 sees weapon-to-target matching conducted by targeting personnel who match weapons capabilities to desired effects against prioritised targets. The final prioritised targets are matched against available air capabilities and the daily guidance to apportion the total number of air sorties, by air mission type, for each objective or task. This information is given to a master air operations plan (MAOP) team during the formal guidance, apportionment and targeting (GAT)-to-MAOP handover briefing.

4.19 **Allocation.** The MAOP team allocates suitable air power capabilities to missions following the GAT guidelines. The MAOP is the plan of employment that forms the foundation of the ATO. The MAOP normally provides a graphic depiction of capabilities required for a given period and is a key element of the concept of air operations. The development of the MAOP includes: a review of the joint commander's and CFACC's D&G; component air plans and their support requests; updates to target requests; availability of capabilities or forces; targets issued from the air PTL; and aircraft allocation. Components may submit critical changes to target requests and asset availability during this phase of ATO development. Following the joint commander's air apportionment decision, the CFACC translates that decision into total number of sorties by aircraft type available for each objective/task. Each air capable component prepares an allocation request message for transmission to the NCS/NFS JFAC HQ and/or Deputy Commander Air combined staff (DCDR-Air CS) prior to initiating the MAOP process. Excess air sorties not required by other components and available for tasking are reported to the CFACC. The MAOP is developed based on the joint

[57] The STT is the visualization of the CFACC's contribution to the operation plan.

commander's air apportionment decision, internal requirements and air support request messages received.

4.20 Phase 3 ends with CFACC's approval of the MAOP, typically during a formal MAOP approval briefing.

Phase 4 - Air tasking order development

4.21 The main activity in phase 4 is the development and promulgation of the ATO. Following the MAOP approval briefing, a draft ATO is developed. The draft ATO will be submitted to the CFACC for approval during the ATO release briefing. The phase ends with the ATO being released and distributed.

Phase 5 – Execution

4.22 Phase 5 covers the execution of the ATO. The NCS/NFS JFAC HQ and/or DCDR-Air CS and subordinate air command and control (C2) elements execute the plan, revising tasking as required, and coordinating or de- conflicting any changes. The combat ops division is responsible for C2 during ATO execution as follows.

a. The NCS/NFS JFAC HQ and/or or DCDR-Air CS must be responsive to required changes in the operating environment during the execution of the ATO. In-flight reports, the discovery of dynamic targets and initial battle damage assessment, may necessitate the redirection of joint air capabilities or forces either before launch or once airborne.

b. During execution, the NCS/NFS JFAC HQ and/or or DCDR-Air CS is the central facility responsible for revising the tasking of joint air capabilities or forces. It is also charged with coordinating and deconflicting those changes with the appropriate control facilities, components or nations.

c. During execution, the NCS/NFS JFAC HQ and/or or DCDR-Air CS is responsible for re-tasking air operations assets to respond to shifting targets or changing priorities. Ground, airborne, and maritime C2 platform mission commanders may be delegated the authority from the CFACC (under the same conditions outlined above) to redirect sorties/missions made available onto higher priority targets as necessary. It is essential, however, that the NCS/NFS JFAC HQ and/or or DCDR-Air CS be notified of all redirected missions.

d. To minimize the risk of fratricide, organic and national air assets and aircraft transiting from, to or through the JOA, should be captured in the ATO. The appearance of these assets in the ATO does not imply in any way tasking or command authority by the CFACC.

Phase 6 – Assessment

4.23 The main activity in phase 6 is the evaluation of the results of air operations. To judge true progress, a clear and logical linkage between objectives and tasks, as laid down in the STT, is key. The subsequent assessment of the effectiveness of air activity is fed back into the air planning cycle to inform the process by adapting STT and apportionment recommendations.

4.24 The assessment process is not limited to the 72-hour cycle. Tactical and combat assessment can continue over days or even weeks, as it often relies on information from various sources both within and outside the theatre.

4.25 Assessment is not the end of the air tasking cycle; it is an ongoing activity that provides important inputs to decision-making and supporting processes throughout the planning cycle.

Section 5 - Guidance, apportionment and targeting

Guidance

4.26 Based on the joint commander's direction and guidance given in the JCO together with the objectives and desired effects, the CFACC provides their intent, direction, and guidance on how the air component will contribute to the achievement of the joint commander's mission through the employment of assigned air assets. The CFACC's D&G is part of the AOD and is amplified by daily tactical guidance, which must be translated into the ATO, daily special instructions (SPINS) and the respective ACO.

Apportionment

4.27 Air apportionment enables the joint commander to prioritize joint air effort consistent with campaign or operation phases and objectives. Given the many functions that a joint air operation can perform and its ability to rapidly shift from one function to another, the joint commander pays particular attention to apportionment. After consulting with other CCs, the CFACC or DCDR-Air submits an air apportionment recommendation for approval by the joint commander and as guidance for upcoming targeting cycles. The methodology the CFACC or DCDR-Air uses to make the recommendation may take the form of priority or percentage of effort against air component assigned missions for the campaign.

Targeting

4.28 Following Supreme Allied Commander Europe's strategic planning directive, the joint commander normally establishes and defines the role of the target validation board, the joint targeting working group (JTWG) and the JTCB. The target validation board is the functional board, chaired by the joint commander, supported by operations, intelligence and legal advisors (LEGAD) staff, authorized to validate targets to the joint target list (JTL) or restricted target list. Validated targets are placed either on the JTL or restricted target list. Once potential targets are validated, they can be nominated for approval via the JTCB. When

prioritized, validated targets are added to the JPTL. Intelligence staff use the JPTL targets to coordinate target intelligence collection requirements in support of combat assessment. All lists and target folders are to be maintained and updated in a database accessible via the NATO joint targeting system.

4.29 The joint commander establishes a JTCB comprising representatives from the joint HQ, all components and supporting commands of the joint force and, if required, national liaison representatives. The chairman of the JTCB gathers inputs from the targeting community, including the IACB to provide the optimum approach for creating the desired effect with respect to each target.

4.30 The joint commander defines the role of the JTCB. Typically, the JTCB would validate nominated targets proposed by subordinate CCs and approve a synchronization of targeting actions to leverage the effects of the joint force. The no-strike list (NSL) is maintained by the joint HQ. The NSL comprises entities that are designated by the NAC as protected (entities which are not to be engaged due to protection by international law or for policy reasons as determined by the NAC). The JTCB is the primary panel for the synchronization and management of the joint targeting activities. As such it is required to prepare target lists for JCB review and if necessary, the joint commander's approval, maintain the targeting database and coordinate the production of target materials.

4.31 The JTCB is supported by a JTWG that prepares and staffs targeting products before presentation to the JTCB. The JTWG is not a decision-making body.

4.32 Targeting is not to be confused with combat engagement. Within the joint targeting process there are two targeting methods to prosecute targets: deliberate and dynamic.

a. **Deliberate targeting.** Deliberate targeting prosecutes planned targets known to exist in an area of operations with scheduled actions. The target data has sufficient detail to allow the capability matching and force assignment elements of the joint targeting cycle to be planned and conducted, and the target issued from the air PTL to be included on the ATO. This is most effective when target parameters, such as location, are well known or predictable. Once validated and synchronized during the JTCB process, targets are then listed on the JPTL for tasking to the subordinate CC and potential inclusion on the ATO.

b. **Dynamic targeting.** Dynamic targeting prosecutes targets that have received some target development but were not detected, located or selected for action in sufficient time to be included in the deliberate process. Dynamic targeting also applies to unexpected targets that meet criteria specific to operational objectives. Prosecuting these targets may be possible by redirecting assets from their planned missions. Dynamic targeting is a time-constrained process that should be flexible enough to strike targets when the deliberate cycle can't provide a timely response against a target.

4.33 Of the targets on the JPTL, certain targets may be further designated as high value, high pay-off, and/or time-sensitive. A high-value target is a target identified as critical to the enemy or organization for achieving its goal. A high pay-off target is a high value target, the successful influencing of which offers a disproportionate advantage to friendly forces. Finally, a target may also be designated as a TST.

4.34 **Time-sensitive targets.** TSTs are those targets requiring immediate response because they pose (or will soon pose) a danger to friendly forces or are highly lucrative, fleeting targets of opportunity whose destruction is of high priority to achieve campaign objectives. The time available does not allow for the standard targeting timeline to be followed. Most TST engagements involve assets from multiple components operating together to detect and engage the target and assess the results. Consequently, they are prioritized, categorized, coordinated, deconflicted and directed for engagement at the joint force level by a TST coordination element or joint TST cell through the NCS/NFS JFAC HQ and/or or DCDR-Air CS and other component TST cells. TSTs are pre-approved by the joint commander via the JTCB. Successful TST engagement requires an accelerated decision-making process, achieved through appropriate C2 mechanisms, well-understood and well-rehearsed procedures, coupled to prior planning and coordination. Because of their immediacy, TSTs are typically addressed through dynamic targeting.

Section 6 - Air and missile defence planning considerations

4.35 All air defence (AD) capable entities, including surface-based air and missile defence (SBAMD), contribute to the development of the air and missile defence plan. This plan supports the joint commander's operations plan and is meant to coordinate air and missile defence (AMD) activities and to efficiently employ scarce AMD capable assets. This applies especially to the planning of ballistic missile defence (BMD) and cruise missile defence, as missile defence capable assets are very limited and successful adversary attacks with ballistic missiles could have great political and psychological impact.[58]

4.36 SBAMD and BMD designs and plans are based on the number and location of protected assets, the type of adversary (e.g., ballistic missile, cruise missile, hypersonic, etc.), the military and political guidance provided, and the availability and capability of SBAMD resources. This requires to be a dynamic process during the whole operation.

4.37 BMD is a standing NATO peacetime mission and combines assets commonly funded by all Allies as well as voluntary contributions provided by individual Allies. For continuous BMD planning, HQ AIRCOM develops a defence design with a maximized level of protection

[58] Ballistic missile defence and cruise missile defence is the protection of deployed forces and high value assets/areas within a theatre of operations area from attacks by ballistic or cruise missiles.

for NATO Europe.[59] Certain missions may require close coordination between theatre ballistic missile defence and BMD operations.

Section 7 - Special operations forces air operations considerations

4.37 In terms of core roles, attributes and principles of operations, special operations forces (SOF) air operations are very similar to non-SOF air operations. SOF air elements and air component assets can be integrated to execute often strategic missions through the full depth of the engagement space, in a rapid and responsive manner, and can exploit air mobility to require a reduced footprint on the ground. Special operations are usually surface force heavy, but often utilise air mobility to generate flexibility and responsiveness when supporting the SOF principal tasks of military assistance, special reconnaissance, and direct action. SOF air elements may conduct organic ISR or personnel recovery, but may require traditional air support in terms of air-to-air refuelling, ISR, close air support, resupply, or medical evacuation. SOF air operations are integrated into the joint air tasking cycle through the special operations liaison element.

Section 8 - Communication and information systems considerations

4.38 **Communications systems.** The CFACC identifies all validated joint air communications links requirements. The ability to exchange information via reliable secure communications with the joint commander, joint force staff and CCs is key to the successful integration of the joint air effort. Planning addresses the following areas.

a. Promulgation of information exchange requirements as early as possible to ensure that each component can meet interoperable interface requirements, and that effort is made to confirm information exchange connectivity requirements during the planning process.

b. Planning for all information exchange requirements and procedures considers all elements coordinated by information management.

c. That the best mix of computer-aided systems must be available for data transmission as all C2 entities depend on secure and reliable beyond line-of-sight (BLOS), communications and data exchange equipment.

Section 9 - Electromagnetic operations considerations

4.39 Assured access to and effective management of the electromagnetic spectrum (EMS) is a prerequisite for successful military operations. Due to the complexity of the operating environment, EMS management is critical for joint operations, especially for air power, to

[59] PO(2014)0011, dated 21 Jan 14 refers: Clarification of the Term “NATO Europe” with regard to NATO BMD.

operate freely within the electromagnetic environment (EME). Successful electromagnetic operations depend on maximizing use of what can be a congested and contested EME, through planning, coordination, management and deconfliction of friendly and neutral electromagnetic capabilities, whilst exploiting, preventing or reducing the adversary's access and use of the EME.

Signals intelligence considerations

4.40 Signals intelligence (SIGINT) is intelligence derived from collecting and exploiting electromagnetic signals or emissions. It is the generic term used to describe communications intelligence and electromagnetic intelligence when there is no requirement to differentiate between these two types of intelligence, or to represent their fusion. Airborne SIGINT capabilities enable real (or near real) time assessment of hostile air or surface-based electromagnetic emitters and the correlation of location, type and mode of emitted signal with the radar tracking information from airborne early warning and air-ground surveillance type aircraft.[60]

Section 10 - Joint intelligence, surveillance and reconnaissance considerations

4.41 The joint commander's staff develops an overall collection strategy and posture for the execution of ISR missions. The J2 staff, through the joint collection management working group (JCMWG) and/or the JCMB, review, synchronize, prioritise, and de-conflict all outstanding collection requirements for the joint commander as follows.

a. The NCS/NFS JFAC HQ or DCDR-Air CS plans, coordinates, allocates and tasks assigned airborne ISR assets, including the NATO ISR Force, to accomplish and fulfil the joint commander's tasks and requirements. The CFACC requests ISR support from the joint commander or other component commanders if assigned assets cannot fulfil specific airborne ISR requirements. It is therefore imperative that the CFACC remains aware of all available surveillance and reconnaissance capabilities that can be integrated into air operations.

b. The intelligence, surveillance and reconnaissance division (ISRD) within the NCS/NFS JFAC HQ integrates airborne ISR. ISR collection managers and operations planners within the ISRD work with the joint commander's staff and other components to effectively coordinate ISR objectives. The ISR collection elements manage and

[60] For further information on SIGINT, communications intelligence and electromagnetic intelligence, refer to AJP-2, *Allied Joint Doctrine for Intelligence, Counter-Intelligence, and Security*.

satisfy the information requirements in accordance with the priorities given by the JCMWG and JCMB.[61]

c. The ISRD provides the joint force integrated information from the available airborne ISR support.[62]

Section 11 - Unmanned aircraft systems planning considerations

4.42 Unmanned aircraft (UA)[63] can conduct a variety of missions in support of Allied operations, from surveillance, reconnaissance, and target acquisition to attack. Doctrinally, UA can be treated similarly to manned systems in the application of established air and space principles and doctrine. However, there are some unique issues commanders and planners should consider when employing these assets.

4.43 The joint commander's allocation and tasking process to determine what UA to allocate from other components to the CFACC is no different than for the manned aircraft allocation decision process. However, larger Class III[64] UA often have much longer endurance than comparable manned systems, which may further allow more flexible tasking of the aircraft and/or payloads dependent upon the joint commander's priorities.

4.44 UA communication links are generally more critical than for manned systems, as the UA typically rely on a nearly continuous stream of communications for both flight and payload control. Communications availability, frequency deconfliction, and security, especially bandwidth protection, are important considerations. Some unmanned aircraft systems (UAS) have a BLOS control capability and may conduct remote-split operations where the control element is geographically separated from the UAS launch element. These capabilities add flexibility but can present unique basing and C2 challenges.

4.45 UAS mission planning is to be included in the development of the ACO, ATO, and SPINS, and follows all approved planning, guidance, and procedures.[65]

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[61] The joint collection management working group will support the preparation, approval process and distribution of a collection task list.

[62] For further details on joint intelligence, surveillance and reconnaissance tasking and collection management processes, see AJP-2.7, *Allied Joint Doctrine for Intelligence, Surveillance and Reconnaissance.*

[63] Some unmanned aircraft systems (UAS) are referred to as "remotely piloted aircraft system" to differentiate those that are controlled by a pilot who has been trained and certified to the same standards as a pilot of a manned aircraft.

[64] UAS are defined as: Class I UAS if the associated UA has a maximum take-off weight (MTOW) below 150 kg; as Class II UAS if the associated UA has a MTOW between 150 kg and 600 kg; and as Class III UAS if the associated UA has a MTOW above 600 kg.

[65] For additional information on UAS characteristics, planning considerations, and employment tactics, techniques and procedures, see Allied Tactical Publication-3.3.8.2, *Unmanned Aircraft System Tactics, Techniques and Procedures*.

a. **Air tasking order inclusion.** Typically, it is not necessary to include Class I UA on the ATO unless their planned operating altitude conflicts with other airborne operations. Class II and III UA should be included on the ATO for deconfliction. Inclusion of UA in the ATO does not imply any change in command relationships or tasking authority.

b. **Airspace control order compliance.** Compliance with the ACO is critical for all UA, especially since they do not have the "see and avoid" backup plan that manned aircraft have. Adversaries are also developing and acquiring UA, so it is imperative C2 nodes can differentiate between friendly and adversary UA and cruise missiles. This may require specific procedural airspace control mechanisms for UA operations.

c. **Weather.** Weather is a particularly critical element of UA planning and, depending on the type of UA and mission being conducted, planners may have to consider the weather in four separate and widely dispersed locations (satellite relay, launch and recovery base, transit route(s), and anticipated target location).

d. **Space weather.** Like terrestrial weather, space weather can have a significant impact on BLOS UA operations. Degradation or availability of satellite communication and positioning, navigation and timing services due to adverse space weather effects must be considered during planning phases and operations. Lost (or manipulated) link procedures are further developed and are also specific to each system.

e. **Unmanned aircraft systems emergencies.** Managing an UA during an emergency may present different challenges than for manned platforms. Detailed contingency planning for all emergencies, including lost (or manipulated) link, loss of (or manipulated) positioning data, and procedures for safe recovery of the UA are required due to their dependence on information and control data links.

f. **Vulnerabilities.** UA usually do not possess defensive capabilities like manned aircraft and have unique vulnerabilities not present in manned aviation. They also usually fly slower than manned aircraft, making them more accessible for enemy AD systems.

Section 12 - Force protection considerations

4.46 Force protection (FP) is a key enabler of air operations; the projection of air power relies on the protection of a network of airbases, logistical and communications nodes throughout territories and operational theatres. Air assets are expensive, vulnerable and scarce, and the loss of even a single aircraft or person may have operational or even strategic impact. Furthermore, air bases that are located ashore cannot be moved or made invulnerable to all forms of attack as they are generally sited according to the needs of air operations rather than defensive principles. An airbase usually has a large electromagnetic signature, significant cyberspace footprint, a diverse population (both military and civilian) and large quantities of volatile and fragile materiel within its boundaries. Within this context,

FP activities are to be coordinated with air operators, enablers, collocated units and adjacent ground holding units; any of which may be coalition mission participants. Air FP measures need to be responsive, scalable and agile and they fall into four broad categories:

a. **Active defence** includes elements of counter-air operations as well as activities focussed on negating ground threats within the ground defence area;

b. **Passive defence** should seek to provide effective protection of personnel and equipment against the effects of conventional, chemical biological radiological and nuclear weapons, and cyberattack;[66]

c. **Recuperation** covers measures necessary for air and other capabilities to recover from the effects of attack, restore essential services and enable operations to continue; and

d. **Security activities** include protective security, counter- intelligence and policing.

Section 13 - Legal considerations for conducting air operations

4.47 Commanders at all levels plan and execute their missions, including air operations, within the constraints of international and national laws. LEGADs provide aid to the commander to ensure conformity with treaty and customary international law, encompassing the law of armed conflict (LOAC), international human rights law, other relevant areas of international and national law, and relevant rules of engagement (ROE).

4.48 **Law of Armed Conflict.** The LOAC[67] or International Humanitarian Law is the body of law that regulates the conduct of armed hostilities. It includes obligations upon states to protect fundamental aspects impacting the life and dignity of civilians.[68]

4.49 **Rules of engagement.** Military actions are governed by ROE. NATO ROE are authorized by the NAC for NATO/NATO-led operations on approval of the operations plan. ROE are directives to military forces, including individuals, that define the circumstances, conditions, degree, and way force, or actions which might be construed as provocative, may be applied. Should commanders at any level require a change to the extant ROE to carry out their assigned task, they may request a change, with justification, through their chain of command.[69] It is the commander's responsibility to use only that force which is in accordance with the principles of international law, as stated above. ROE should be timely, appropriate,

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[66] For more information, refer to AJP-3.8, *Allied Joint Doctrine for Comprehensive Chemical, Biological, Radiological, and Nuclear Defence*.
[67] The four main principles of LOAC are military necessity, humanity, distinction, and proportionality.
[68] Some NATO members do not recognize the LOAC and the International Humanitarian Law as synonyms.
[69] Responsibility for authorising changes to rules of engagement profiles rests with the NAC.

current, responsive to change, and not excessively specific or restrictive. It is essential that adjacent or mutually supporting formations and forces understand each other's ROE, as they may differ. ROE never limit an individual's right of self-defence, but provide political, legal and policy direction for the conduct of NATO operations. Even if no rule from a particular series is included, the relevant principles of law apply.

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Chapter 5 - The space domain

Section 1 - Introduction

5.1 The evolution in the uses of space and rapid advances in space technology have created new opportunities, but also new risks, vulnerabilities, and opponents for the Alliance's and Allies' security and defence. Space is increasingly contested, congested and competitive and requires the Alliance to be able to operate effectively across the space domain despite systemic challenges to include an environment characterized by disruption, denial and degradation.

5.2 Space is essential to Alliance deterrence and defence activities. In this context, NATO views space to be an operational domain as well as being a key enabler to military operations. Space-related data, products, services (DPS) as well as technology and applications are increasingly widespread and accessible throughout political, economic, social, cultural, informational security and defence fields.

5.3 NATO's awareness, responsiveness, resilience and reliance on space-based DPS are critical to the Alliance's ability to conduct operations and meet mission's objectives. However, because of this increased reliance on space capabilities, a loss of space-based services could severely impact operations. For this reason, commanders' awareness of the space domain, its dependencies, vulnerabilities and associated threats, is essential for the effective employment of space capabilities to enhance support to NATO operations in a multi-domain operations context and mitigate effects as needed.

Section 2 - Fundamentals

5.4 Space, as an operational domain, is affected by specific physical characteristics and attributes. The space domain provides capabilities for a wide range of systems operating across all domains.

5.5 NATO (through Allies) needs to have sufficient access to and freedom of action in space to allow utilisation of capabilities across all domains. The military use of space capabilities has expanded significantly since the first military satellites were placed in orbit. Due to the global reach of satellites, they are often considered strategic assets and serve multiple objectives and commanders at the same time. Such systems have proven to be a potent force multiplier across all domains and support the joint force across all identified space functional areas.

5.6 To ensure effective integration, all personnel engaged in the planning, execution, and command and control (C2) of joint operations are to have a common and clear understanding of how space capabilities (nationally and commercially owned/operated) contribute to, and can be integrated into, NATO missions, activities, and operations. Space operations include all activities that utilize space capabilities to ensure space domain awareness (SDA),

contribute to space domain coordination (SDC) and provide operational space support (OSS).

5.7 Numerous actors, including potential adversaries, are increasingly seeking to exploit space for military purposes. Products and services can easily be procured from commercial sources for most available space capabilities. In addition, NATO leadership needs to be aware that potential adversaries are not only working to gain an operational advantage in space, but also to challenge and deny such advantages for the Alliance. Options available to control adversarial access to space capabilities include diplomatic, information, military, and economic measures.

5.8 A space system is composed of the following segments.[70]

a. **Space segment.** The space segment consists of the on-orbit objects, usually satellites.

b. **Link segment.** The link segment consists of uplinks, downlinks and crosslinks, utilizing the electromagnetic spectrum to exchange information.

c. **Ground segment.** The ground segment consists of terrestrial components of the system which provide C2 centres, data processing data storage and associated antennas designed to analyse and manage data flows from and toward the satellites for its control.

d. **User segment.** The user segment is the consumer of DPS and is inclusive of all NATO operational and functional domains.

5.9 Within NATO, space capabilities that contribute to mission planning and execution at all levels of operations can be provided from national or commercial space entities and capabilities. Currently, NATO does not own or operate any space segment of any space system, but does own and operate a number of terrestrial elements of the ground segments of some space systems (e.g., anchor stations and terminals for satellite communication). While military units in theatre may have organic assets which could support missions, activities and operations, a significant portion of the OSS is made available from outside the operational area.

5.10 For the purposes of this document, the description of space capabilities supporting the three operational functions[71] as well as the DPS supporting the joint force are as follows.

a. **Space capabilities.** DPS to support NATO military commanders, staffs and forces. These capabilities include, but are not limited to: global, strategic and intra-

[70] See IMSM-0179-2022 *Space Domain Operational Taxonomy and Definitions*.
[71] See paragraph 5.18.

theatre satellite communications (SATCOM); positioning, navigation, and timing (PNT) services; terrestrial (geographical) and space environmental monitoring, to include geospatial, meteorological and oceanographic data and products or their combination; contributions to space situational awareness (SSA); intelligence, surveillance and reconnaissance (ISR); and NATO shared early warning (SEW). They can also contribute to friendly force tracking and maritime tracking (satellite-based automatic identification system).

b. **Satellite data.** Satellite data is transmitted from the ground segment to the satellite in order to operate it.

c. **Space data.** Space data is the information acquired, produced, or provided by space systems.

d. **Space products.** Space products are processed, exploited, and distributed space data.

e. **Space services.** Space services are capabilities or informations delivered by or through space systems to the users.

Section 3 - Space domain attributes

5.11 Due to the unique nature of the space environment, space operational activities have their own specific characteristics. In particular, the following aspects are key attributes which contribute to NATO's approach to space.

Physical attributes of the space environment

5.12 **Geographical boundaries.** Space is the 'volume' beyond the upper limits of airspace, above the Karman Line.[72,73] Although the upper limit of national airspace is not internationally agreed, it is commonly understood that overflight of national territory within space by space objects does not interfere with national sovereignty. This gives space capabilities an advantage over assets in other environments, which cannot be employed without crossing borders.

5.13 **Access and coverage.** The absence of geographical boundaries and terrestrial obstructions in space gives satellites and other space systems global access. With enough satellites in a properly configured constellation, it is possible to maintain continuous coverage and access to any point on the surface of the Earth. Global access is one of the key advantages that space capabilities offer. However, spacecraft mission, orbital mechanics

[72] See IMSM-0179-2022 *Space Domain Operational Taxonomy and Definitions.*
[73] The Karman Line is the boundary between the Earth's atmosphere and outer space at 100 km above sea level (International Astronautical Federation).

and frequency propagation define the practical temporal and spatial limits for access and coverage for each individual satellite. Additionally, some space services can serve multiple commanders and/or users around the world simultaneously (e.g., SEW and PNT).

5.14 **Persistence.** Orbital mechanics dictate the movement of satellites and thus provides some advantages and disadvantages that need to be considered. This allows these assets to remain in orbit for extended periods of time (generally measured in months or years).

Additional attributes

5.15 **Versatility.** A single platform can be designed to carry multiple payloads to simultaneously provide multiple services to multiple users and or nations. Therefore, most of the time, the configuration of the platform can also be scalable and adapted to users needs.

5.16 **Shared/dual use.** Military and civil sectors are increasingly dependent on space capabilities. For this reason, and to reduce costs, space systems frequently serve both civilian and military purposes. Commanders should be aware that space capabilities supporting NATO operations are provided by space systems under national sovereignty or commercial governance or control. Therefore, these relationships often complicate planning and utilization of space products and/or services, however, they need to be understood and established.

Section 4 - Space domain limitations

5.17 The use of space capabilities encompasses specific limitations. In particular, the following aspects need to be understood to better exploit space capabilities.

a. **Orbital mechanics.** A satellite path is dictated by the designated orbit, chosen by design under the constraints provided by the laws of physics. For this reason, and for most of the time (except for certain geosynchronous satellites or connected constellations), orbital mechanics prevents individual satellites from providing continuous support to a given terrestrial area of interest. In general, moving a satellite to a new orbit is a complex operation which negatively impacts its lifespan. Moreover, there are significant planning factors associated with the movement of satellites, most of which are at the discretion of the satellite owner.

b. **Predictability.** Because orbits are easily determined, short dwell times and intermittent coverage by a given satellite may provide an adversary a significant window of opportunity for unobserved activity. Moreover, an anti-satellite capable adversary can directly threaten friendly satellites. However, this predictability can also be exploited by mission participants or commercial operators for both warning of satellite over-flight and maintaining situational awareness by tracking the location of objects in space.

c. **Availability.** While providing specific space support in NATO operations, nations retain C2 over their strategic assets. Therefore, national prioritization schemes

dictate how NATO space support requirements are fulfilled. Competition for bandwidth, tasking priorities, policy sharing of the data and similar constraints, combined with a satellite's physical access to specific locations, can impact the availability of space support. Ultimately, a commander may not receive the desired support.

d. **Vulnerability.**

(1) Space capabilities are vulnerable to human-made intentional threats and non-intentional risks, including space debris, and natural influences. Adversaries may seek to exploit this vulnerability and the growing dependence on space capabilities. Therefore, attacks on space systems are increasingly likely. Commanders should anticipate, and have plans to mitigate, the effects of adversary or third-party attempts to interfere with, disrupt, or deny friendly force access to space capabilities. In addition to protecting their own national assets, Alliance members should also consider how to deny the use or exploitation of these space assets by adversaries.

(2) Satellite links are susceptible to interference, jamming and spoofing. Space assets and ground facilities can be subjected to attack. Moreover, all segments are exposed to threats through cyberspace since space-related information is susceptible to interception, corruption and exfiltration. Knowledge of an adversary's counter-space capabilities – possibly including direct ascent, cyber-attack, co-orbital or high energy weapons– allows a commander and their staff to develop appropriate responses.

(3) Natural effects such as weather (terrestrial weather or space weather) may affect space systems and their subsystems, as well as interfere with the link segment, significantly impacting communications or PNT capabilities but also possibly impacting the satellite control. Awareness of the scale and timing of any meteorological effect is necessary to ensure that the necessary mitigation measures are taken during operations.

e. **Operational lifespan.** A satellite's operational lifespan is based on several factors which include spacecraft design features and environmental conditions (debris impacts). Maintenance, upgrades, and modifications are generally limited to software updates or utilizing on board back-up components (redundancy). In particular, the amount of fuel carried on board limits orbital manoeuvres and movements.

Section 5 - Space domain operational functions

5.18 The space domain operational functions consist of SDA, OSS, and SDC, which enable and leverage operations within the space domain.

a. **Space domain awareness.** SDA is the common understanding, comprehension, and perception of all aspects associated with the space domain, including capabilities, limitations, vulnerabilities, and threats.

b. **Operational space support.** OSS is the provision of space DPS in support of NATO activities, missions, and operations.

c. **Space domain coordination.** SDC is the facilitation, integration, and synchronization of effects and actions relating to the space domain that support the full spectrum operating environment for NATO's activities, missions, and operations.

Section 6 - Space domain functional areas

5.19 **Space situational awareness.** SSA is the detection, identification, tracking, understanding, and characterization of space objects and their operating environment.

5.20 **Intelligence, surveillance, and reconnaissance.** Space-based ISR provides information about activities and resources of adversaries, and the characteristics of a particular area of interest.

5.21 **Positioning, navigation, and timing.** PNT delivers current geographical position location, accurate and precise time, enabling movement from one point to another to support strategic, operational, and tactical missions in all domains.

5.22 **Satellite communications.** SATCOM provides beyond line-of-sight connectivity which allows the Alliance to maintain strategic, operative and tactical situational awareness and to convey its intent to tactical manoeuvre forces.

5.23 **Shared early warning.** Space-based SEW provides informations regarding ballistic missile launches.

5.24 **Meteorological and oceanographic.** Terrestrial and space weather environmental effects can be disruptive to operations and should be considered as potential risk factors during planning and execution of operational missions. Understanding the effects and potential mitigation measures of terrestrial and space weather is critical to the successful execution of the mission in space, in the air, on the ground or at sea.

5.25 **Space security.** Space security is the measures taken to protect the Alliance's freedom of action and freedom of manoeuvre within space and the utilization of space systems and capabilities.

Section 7 - Space operations

5.26 While NATO neither owns nor directly operates any spacecraft, NATO's combined command and force structure depends on space capabilities across the spectrum of multi-domain operations.

a. Space is an inherently global environment and any conflict that extends into space has the potential to affect all users of space. Even in cases where NATO is not involved in conflict, Allies' space systems could be affected.

b. Allies retain jurisdiction and control over their objects in space as well as full authority and sovereignty over their space capabilities and resources.

c. The Alliance does not plan to develop space capabilities of its own; therefore, Allies undertake to provide, on a voluntary basis and in accordance with national laws, regulations and policies, the space DPS or effects that could be required for the Alliance's operations, missions, and other activities.

d. NATO does not plan to become an autonomous space actor. NATO seeks to complement and add value to the work of Allies and to engage with other relevant international organizations, as appropriate, avoiding unnecessary duplication of effort.

5.27 Space operations are the offensive and defensive actions intended to limit the functionality, or maintain control of and access to space capabilities.

a. **Offensive space operations.** Offensive space operations are the actions that result in the disruption, denial, degradation or destruction of nodes, linkages or services of a space system**.**

b. **Defensive space operations.** Defensive space operations are the active and/or passive measures taken to protect and maintain access to friendly space capabilities and services.

Section 8 - Strategic communications and legal considerations for conducting space operations

5.28 NATO as an organization is not party to any of the space treaties, thus questions of their interpretation are ultimately for the individual Alliance nations, not for NATO as an international organization. However, it is important to have a common understanding within the Alliance of certain legal considerations and legal framework across the space domain.[74] Furthermore, NATO supports international activity to develop rules and principles of responsible space behaviours.

[74] For a better understanding of established space law, consider the following sources: *1967 Outer Space Treaty* and *MCM-0039-2021, Space Domain Action Plan*, Annex C: BI-SC Legal Considerations in Support of the Implementation of the Space Domain (NATO Restricted).

Section 9 - Space domain coordination

Overview

5.29 **Commanders.** Commanders at every level have a responsibility to guide, manage, synchronize and direct activity in support of achieving military objectives across the full spectrum of conflict, to include the use of available space DPS.

5.30 **Space support coordination function.** The space support coordination element (SpSCE) provides selected staff personnel who serve as the commander's primary advisors for space support in operations. The SpSCE maintains the responsibility for supporting the integration of space products and services; for the exploitation of space DPS; and for the coordination of space security activities that are conducted by NATO, or that have an impact on space support in NATO operations.

5.31 **Theatre space component.** The theatre space component (TSpC) provides a strengthened advisory element with respect to space and enables Supreme Allied Commander Europe's (SACEUR's) synchronization and prioritization of activities across all domains from baseline activities and current operations through crisis up to the maximum level of effort. As such, the TSpC executes these functions to increase SACEUR's awareness, planning, and decision making processes.

5.32 **Space support coordination elements.**

a. The strategic-level SpSCE:

(1) Is focused on setting the conditions and establishing the cooperation frameworks within NATO for space support in operations.

(2) In advance of any NATO operation, is responsible for providing recommendations with respect to OSS, SDA and SDC.

(3) Advises on the alignment of forces, augmentation and interfaces required to support the full spectrum of NATO operations.

(4) Reports to SACEUR, who has the responsibility to institute processes to request and deliver space products and services that reside with each individual contributing NATO nation and to establish the formal agreements to ensure that access through the TSpC.

(5) Provides oversight, guidance, and coordination to support education, training, and overall preparedness of subordinate organizations to allow them to perform the expected space related function, roles, and responsibilities.

(6) In time of operational contingency, engages within the NATO process to identify capabilities that will be provided by each supporting NATO nation,

identifies capability gaps and assesses their potential impacts on NATO's multi-domain operations.

b. The operational-level SpSCE:

(1) Focuses on the 3 operational functions, taking advantage of the established processes, formal relationships, agreements, and the DPS provided by nations.

(2) Maintains awareness of space systems, capabilities, and operational dependencies and provides timely recommendations on courses of action and other space support options to the command group, and across the staff and subordinate units.

(3) Collects, understands and processes requests for space support through the NATO established mechanisms.

(4) Supports the identification and recommendation for prioritization of delivery of space related products and services.

c. The tactical-level SpSCE:

(1) Interacts, coordinates and operates with the operational-level SpSCEs and NATO space entities.

(2) Provides recommendations, defines requirements and facilitates the provision of space support in operations to the tactical level.

(3) If a SpSCE is not available at the NATO force structure heqdquarters level, a space liaison element can be established, supported by the NATO space centre and the other NATO Command Structure SpSCEs.

Space support coordination element considerations

5.33 **Preparation.** Space systems provide unique capabilities that are generally available prior to a crisis arising, frequently without the requirement for (pre) deployment into theatre. Information from space systems is essential for the effective pre-deployment of NATO forces, early phase campaign planning and, for operations in remote areas, may be the sole source of current geospatial data prior to entry into theatre. Space capabilities are a key enabler, in all campaigns, in all phases, and their availability is often a precondition for success. Therefore, they need to be deliberately planned for and protected.

5.34 **Establishing coordination relationships.** Because many systems are classified national assets, or have complex relationships with non-governmental organizations, preparatory planning and agreements should be in place prior to start of operations to ensure appropriate availability to support NATO. This process should be made as transparent as possible to the supported commander, preferably by close coordination with

existing/established staff functions to integrate, coordinate and synchronise space capabilities in the framework of operations. Detailed coordination should provide clarity of the relationships to NATO strategic and operational commands and clearly define the process for requesting and disseminating the products and/or services.

5.35 **Space dependency and operational risk.** Unique planning and operational considerations derive from the special characteristics of space and the difficulty in gaining access to it. The SpSCE supporting the planner needs to understand individual system strengths, weaknesses and limitations when considering the usage of space capabilities or products and is to have a firm knowledge of the threats to the use of those systems by an adversary as well as understanding what steps can be taken to prevent or limit an adversary's access to space products and services. This understanding of dependencies and vulnerabilities enables the assessment of the operational risk to and potential mitigation measures for the joint force if space capabilities are degraded or lost.

Implementing space support coordination elements at the strategic/operational level

5.36 The NATO crisis response planning system covers the planning process and methodology at all levels of command.

a. Space aspects must be considered at all planning stages. Space is part of the strategic and operational assessment of the situation and informs the comprehensive understanding of the operating environment.

b. NATO's potential strategic advantage is largely related to space dependencies, vulnerabilities and capabilities; these are to be identified and considered to inform the choice of military response options.

c. The employment of space capabilities in theatre has to be considered during centre of gravity analysis and course of action development (including desired and non-desired effects) across all planning phases.

5.37 Identifying space support requirements and potential non-space-dependent alternatives is part of strategic and operational concept of operations development. This may result in space support requests to NATO member nations/capability providers and complements the combined joint statement of requirements process, and the generation of a space specific strategic operation plan (OPLAN). [75]

[75] For the scope of a strategic OPLAN space, see references PO(2019)0279 (INV), *NATO Overarching Space Policy*, dated 24 June 2019 and SH/SDP/SDF/OCS/22-10329, ACT/CAPDEV/CAP/TT5002/SER:NR256, *Space Domain Concept of Operations*, dated 09 December 2022.

5.38 The strategic OPLAN development includes the force generation phase, where space support requirements are presented to NATO member nations.

a. Nations should provide planning information on services, products, access procedures and points of contact for strategic and operational-level planning and execution of the operation.

b. Strategic and operational plan development translates space aspects of the mission into the space operations, detailing the planned employment of space in operations, respective roles and responsibilities and liaison authorities. This establishes the baseline for the execution phase.

5.39 The planners supporting the SpSCE function on the strategic-level and operational-level staffs, may provide significant input to the operational planning process.

a. Some space capabilities are already planned for and utilized by functional areas in traditional staff positions (e.g., SATCOM by J6 or ISR by J2).

b. A clear delineation exists between the space planners and those functional areas with established functional area planning guides, standing operating procedures (SOP) and tactics, techniques, and procedures (TTP).

5.40 Tailoring space operational activities to a mission and a theatre requires a shared and active coordination between the user and providers.

a. Space operations should be integrated and considered within the existing NATO planning framework.

b. The key is to bridge between the comprehensive operations planning directive and the applicable mission area.

Implementing space support coordination elements at the tactical level

5.41 Commanders at every level, with the support of a SpSCE, should develop and maintain a prioritized list of space requirements based on operational objectives and activities. Execution responsibilities include:

a. Maintaining SDA, to include the operational impacts;

b. Providing SDC by coordinating, integrating and synchronizing space capabilities for the command within its operational environment, including ensuring optimum interoperability of space capabilities with Allied/coalition forces;

c. Providing OSS through the provision of space expertise across the staff processes and functions;

d. Maintaining appropriate command or coordination relationships; and,

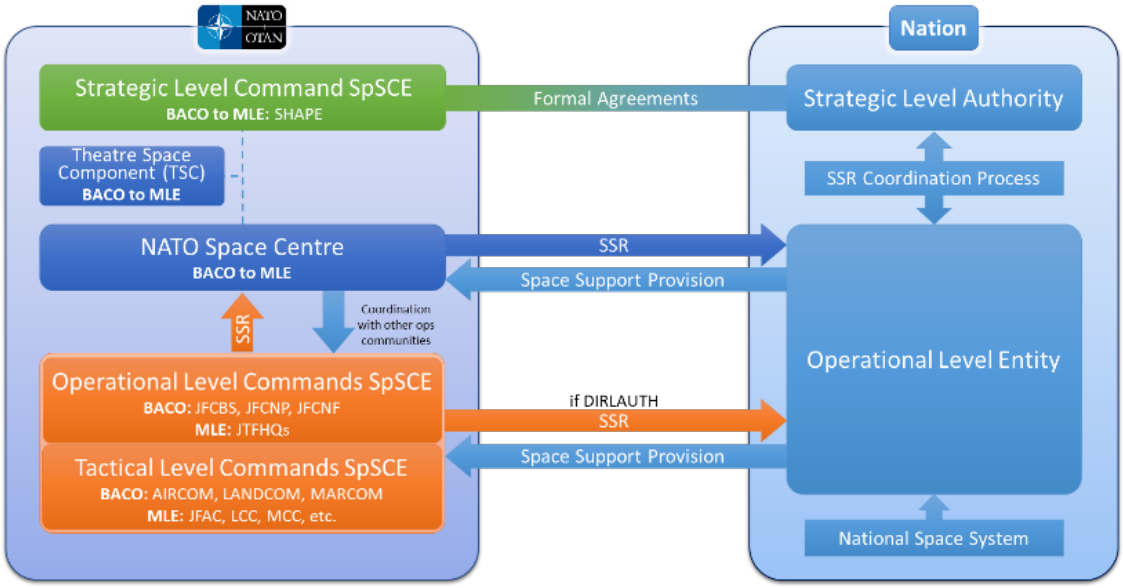
e. Planning space support to operations, including requesting any emerging space support requirements.

5.42 During the execution phase of a NATO operation, there is a need for managing, coordinating and adjusting space support.

a. The SpSCE function at each level provides feedback on operational execution and helps to identify any emerging space support requirement which can be fulfilled using formal arrangements and the OPLAN.

b. This process supports the battle staff across all functional areas by utilizing available space capabilities to support dynamic operational requirements.

c. This may result in updating space related documents (OPLAN, fragmentary orders, TTPs, SOPs, and standing operating instructions) as required.

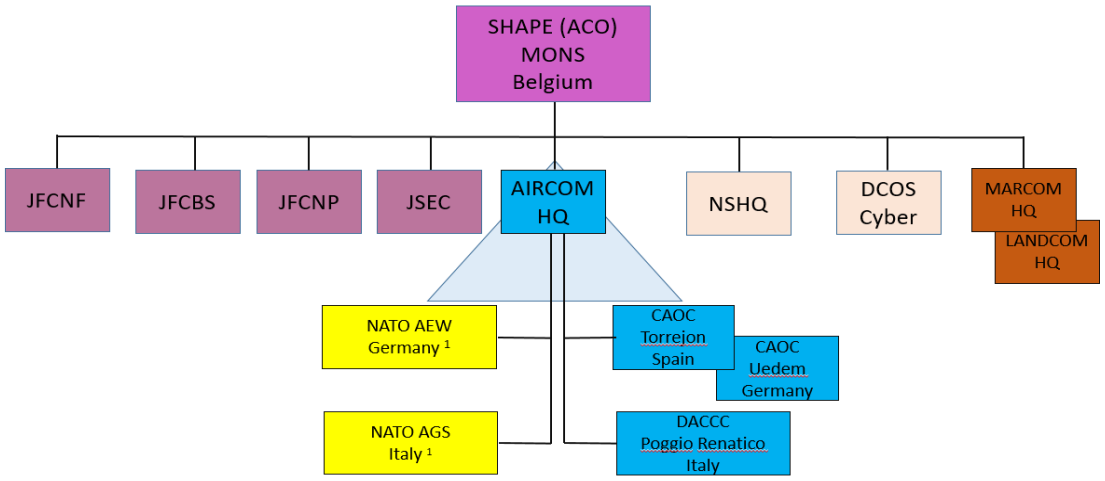


SpSCE	space support coordination element	AIRCOM	Allied Air Command
BACO	baseline activities and current operations	LANDCOM	Allied Land Command
MLE	maximum level of effort	MARCOM	Allied Maritime Command
JFCBS	Allied Joint Force Command Brunssum	JTFHQ	joint task force headquarters
JFCNP	Allied Joint Force Command Napels	MCC	maritime component command
JFCNF	Allied Joint Force Command Norfolk	LCC	land component command
JFAC	joint force air component	SSR	space support request

Figure 5.1 - Space domain coordination at strategic and operational levels

Annex A - NATO Command Structure

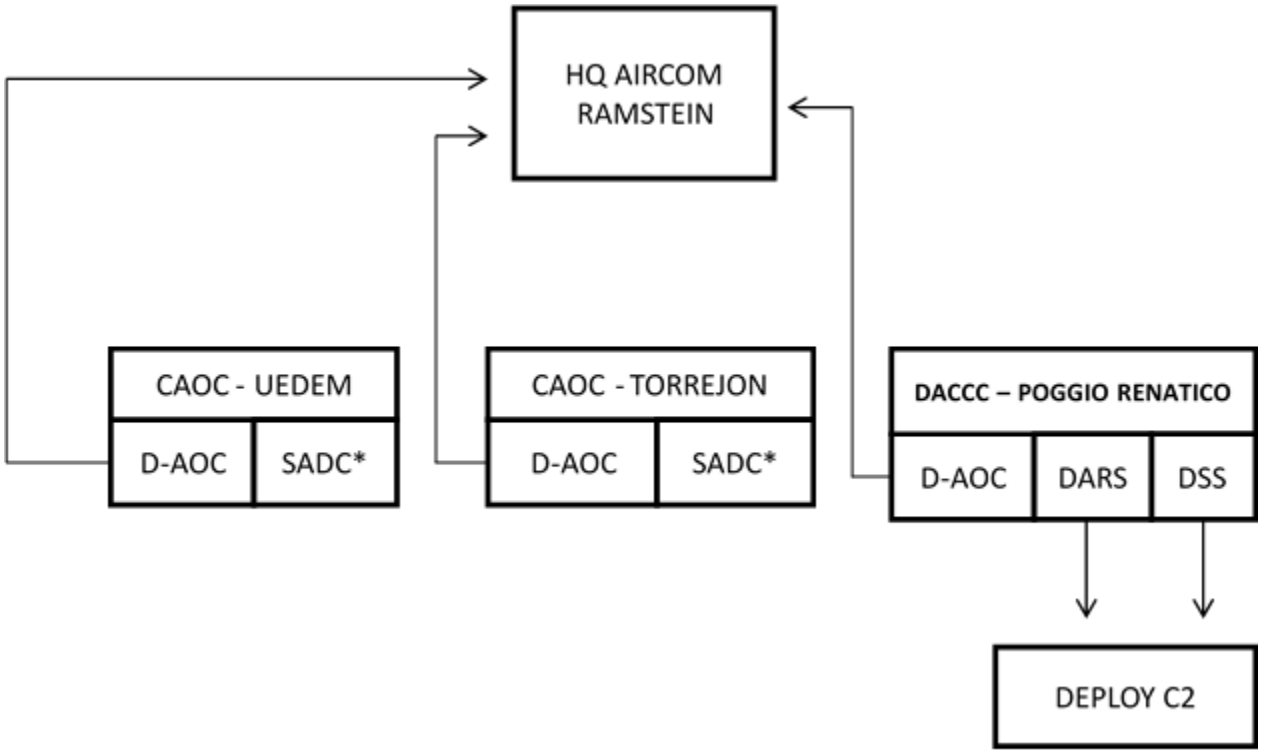
A.1 The NATO Command Structure (NCS) air command and control (C2) organisation is responsible for executing standing missions and tasks and enables the seamless transition from baseline activities and current operations to maximum level of effort. As depicted in Figure A.1, the NCS air C2 structure consists of the Headquarters Allied Air Command at Ramstein, two combined air operations centres (CAOCs) and a Deployable Air Command and Control Centre (DACCC). Figure A.2 shows a more detailed view of the internal structure of these Allied Air Command elements. The CAOCs are composed of two entities: the static air defence centre, which is responsible for the peacetime air policing missions; and the deployable air operations centre (D-AOC), which during crisis supplements the joint force air component structure. The D-AOC provides operational flexibility along with the deployable air control centre/recognized air picture production centre/sensor fusion post of the DACCC. The CAOCs are in Uedem (Germany) and Torrejon (Spain); the DACCC is in Poggio Renatico (Italy).



ACO	Allied Command Operations	NSHQ	NATO special operations headquarters
JFCNF	Joint Force Command Norfolk	DCOS	deputy chief of staff
JFCBS	Joint Force Command Brunssum	MARCOM	maritime command
JFCNP	Joint Force Command Napels	LANDCOM	land command
JSEC	joint support and enabling command	AEW	airborne early warning
AGS	Alliance ground surveillance	DACCC	Deployable Air Command and Control Centre

Figure A.1 – NATO Allied Command Operations command and control headquarters[76]

[76] Footnote 1 inside figure: delegated operational control from Supreme Allied Commander Europe.



HQ AIRCOM	headquarters Allied Air Command	DACCC	Deployable Air Command and Control Centre
CAOC	combined air operations centre	DSS	deployable sensor suite
D-AOC	deployable air operations centre	C2	command and control
SADC	static air defence centre		
DARS	deployable air control centre/recognized air picture production centre/sensor fusion post		

* SADC is responsible for the enduring air policing missions

Figure A.2 – Detailed air command structure

Annex B - NATO Command Structure joint force air component headquarters organization[77]

The NATO Command Structure joint force air component headquarters

B.1 The NATO Command Structure joint force air component headquarters (NCS JFAC HQ) is the Combined Force Air Component Commander's (CFACC's) primary command and control (C2) element.[78]

B.2 The NCS JFAC HQ includes appropriate component representation and subject matter experts (SMEs) who provide the knowledge and experience required to effectively employ any capabilities or forces made available to the CFACC for tasking.

B.3 If possible, the NCS JFAC HQ billets requiring specific expertise or individuals must be identified, with appropriate personnel allocated, trained, and employed during peacetime exercises to ensure their preparedness for operations.

B.4 **JFAC command group.** The JFAC command group (CG) supports the CFACC by providing direction and guidance, managing the command structure and ensuring air component presence on relevant boards and working groups when deemed necessary. Additionally, the staff provides the focus for all air and space related functional tasks when they are assigned to the CFACC by the Supreme Allied Commander Europe (SACEUR) or a nominated joint commander. Furthermore, the CG needs to be able to plan and execute, or provide support for, additional missions and tasks as assigned by SACEUR and/or the joint commander. The main elements of the CG are:

a. Chief of staff;

b. JFAC director;

c. Director of management;

d. Political advisor;

e. Legal advisor;

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[77] Caveat. The content of this annex is valid for a NATO Command Structure joint force air component headquarters. NATO Command Structure joint force air component headquarters provided from the NATO force structure might deviate from this structure. NATO force structure joint force air component deviations from the NATO Command Structure standards will be described in a national standing operating procedure or a supplement to headquarters Allied Air Command's standing operating procedure or battle staff handbook. However, functional and process connectivity must be ensured.

[78] For a more details see Reference D: AC/OPS/CJFAC/OSJX/CH/33-0613, *AIRCOM JFAC handbook.*

f. Medical advisor; and

g. Gender advisor.

B.5 **Strategy division.** The strategy division (SD) identifies both lethal and non-lethal activities, supports the achievement of operational objectives and end state by developing, refining, disseminating, and assessing and adapting the CFACC's or Deputy Commander Air's (DCDR-Air) air strategy. It acts as the CFACC's or DCDR-Air's focal point for air related plans development during either deliberate planning or crisis action planning. The SD also compiles the inputs to the joint coordination order (JCO) development process for CFACC or DCDR-Air approval and initiates the air tasking cycle via guidance in the air operations directive (AOD). The AOD can be issued - as needed - based on mission requirements, and executed at the operational level, and assess the effectiveness and efficiency of air and air-related information operations. The SD represents the CFACC's or DCDR-Air's core, long-range operations planning and assessment capability.

a. **Strategy integration and coordination cell.** The strategy integration and coordination cell (SICC) is the CFACC's or DCDR-Air's focal point for planning. The SICC ensures effect synchronization with the Joint Force Command (JFC) and the other component commands (CCs), and develops long-range operational alternative plans. The SICC is the focal point during the JCO development process for compiling the inputs from the other divisions and preparing the comments, recommendations and apportionment proposal for CFACC or DCDR-Air approval. It leads on the development of the air strategy for future operations (96 hours ahead and more) to prepare the CFACC or DCDR-Air intents, the air objectives with desired effects and the apportionment recommendations. The SICC consists of the strategy development branch (SDB), the joint effects synchronization team (JEST) and the air operations assessment branch (AOAB).

b. **Strategy development branch.** The SDB is responsible for the development of the AOD, the air defence plan, changes to strategic operations plan, rules of engagement change proposals and consequently change proposals for existing plans or branch plans or sequels.

c. **Joint effects synchronization team.** The JEST ensures cross-domain effect coherence together with the JFC and other CCs.[79]

d. **Air operations assessment branch.** The AOAB is responsible for the production of regular assessments based on measurements of performance and measurements of effectiveness.

[79] For a more details see Reference D: AC/OPS/CJFAC/OSJX/CH/33-0613, *AIRCOM JFAC handbook.*

B.6 **Non-kinetic operations division.** The non-kinetic operations (NKO) division encompasses all non-kinetic (NK) capabilities and activities. The different NK disciplines have unique capabilities, challenges and requirements. To minimize unintended second and third order effects, unambiguous leadership and robust coordination within the NCS JFAC HQ and liaison with the JFC is required. The NKO division consists of the NK strategy team (NKST), the NK plans team (NKPT), the NK operations team (NKOT) and the NK analysis and targeting team (NKATT).

a. **Non-kinetic strategy team.** The NKST delivers long-term, and mid-term plans in coordination across national, Allied Air Command (AIRCOM) and joint capabilities. NKST ensures synchronization and harmonization of cyberspace, space, electromagnetic warfare and information operations effects within the air tasking cycle. NKST works closely together with the SD (JEST) and the combat plans division (CPD) guidance, apportionment and targeting (GAT) team.

b. **Non-kinetic plans team.** The NKPT develops the NK sync matrix to synchronize and deconflict non-lethal activities with other operations.

c. **Non-kinetic analysis and targeting team.** The NKAT provides a consolidated cyber, space and electromagnetic domain picture, integrates domain, national and joint non-lethal capabilities and ensures coherent effects by constant synchronization with SD, CPD and external stakeholders.

d. **Non-kinetic operations team.** The NKOT executes and monitors NK operations.

B.7 **Combat plans division.** The CPD applies operational art to develop detailed execution plans for air and space operations based on the CFACC's or DCDR-Air's objectives that apply specific air and space capabilities and assets to accomplish the CFACC or DCDR-Air mission in fulfilment of SACEUR or the joint commander's operational objectives. The CPD publishes and disseminates the air tasking order (ATO), airspace control order (ACO), special instructions (SPINS), operational tasking data link (OPTASK LINK), operational tasking electromagnetic warfare and other planning/tasking documents as required. The CPD is the focal point for force management, C2 resource management, airspace management and air traffic control at the operational level. In case of nuclear operations, dual capable aircraft are to be tasked directly by SACEUR. The CPD is normally task-organized into functionally oriented core teams: the GAT team; the master air operations plan (MAOP) team; the ATO production team; and the C2 planning team.

a. **Guidance, apportionment and targeting team.** The GAT team is a branch within CPD whose mission is to ensure the linkage between the AOD, CFACC or DCDR-Air vision and its practical application using CFACC's assets to create desired lethal effects. In accordance with the CFACC or DCDR-Air prioritized tasks (derived from strategy), GAT develops the CFACC planning guidance and air apportionment

recommendation. The GAT derives the air prioritized target list from the joint prioritized target list and services the prioritized target list by matching targets to available assets.

b. **Master air operations plan team**. The MAOP team supports the CFACC or DCDR-Air and their subordinate units with an ATO product with corresponding daily SPINS based upon a tactically sound and robust MAOP to create the desired effects during an operation. The secondary objective of the MAOP is to communicate with the CFACC throughout the air planning process and to get their final approval for the MAOP through the MAOP decision meeting.

c. **Air tasking order production team.** The ATO production team produces and distributes the ATO, SPINS and ACO (when delegated).

d. **Command and control planning team.** The C2 planning team develops the detailed C2 execution plans and the data link architecture for the CFACC or DCDR-Air. Major elements include air surveillance and control systems, airspace management, theatre air and missile defence planning, link interface planning, and C2 architecture support planning (see Annex C for details). Some of the C2 documents produced are the air and missile defence plan, baseline SPINS and tactical data link coordination messages, such as the OPTASK LINK.

e. **Joint airspace coordination centre.** The joint airspace coordination centre develops the airspace control plan (ACP); manages and publishes the ACO, receives and coordinates requests for airspace control means (ACM); coordinates/deconflicts requests for the activation of ACM extending into adjacent joint operations areas (JOA); establishes liaison with CCs, appropriate NATO, national and international organizations; and ensures the timely and adequate distribution of the ACO.

f. **Air-to-air refuelling cell.** The air-to-air refuelling (AAR) cell coordinates theatre AAR planning in support of all CCs and establishes appropriate airspace. If NATO member states field fewer or more capable tanker transport aircraft, consideration should be given to building coordination elements between the refuelling cell and the airlift coordination centre (ALCC) to more efficiently use assets that are capable of being employed simultaneously (in a significant way) in both air transport (AT) and AAR roles.

B.8 **Combat operations division.** The combat operations division (COD) monitors the execution of the current ATO. In doing so, the COD should be able to maintain situational awareness of the engagement space and constant contact with subordinate elements and assets. Additional COD tasks are the monitoring of the availability of assets for tasking, responding to battlefield dynamics by C2 of air and missile defence operations and the modifying of the published ATO through adding, deleting, retargeting or changing a sortie's mission (re-role). Furthermore, the COD exercises tactical control over the JOA assets allocated by the CFACC or DCDR-Air during the execution of the ATO. Finally, the COD

assesses the results of air operations and submits reports and recommendations to the CFACC or DCDR-Air.

a. **Current operations cell.** The current operations cell is split into offensive and defensive sections responsible for managing all aspects of on-going air operations. It synthesizes and disseminates the recognized air picture and various reports, to maintain overall situational awareness. The current operations cell also coordinates changes to the ATO and priority target lists and coordinates with the intelligence, surveillance and reconnaissance division (ISRD) to execute all mobile and time-sensitive targets.

b. **Surface-based air and missile defence/theatre ballistic missile defence coordination cell.** The surface-based air and missile defence (SBAMD)/theatre ballistic missile defence (TBMD) coordination cell monitors, assesses and advises on SBAMD and TBMD operations and plans. It is in close contact with the ballistic missile defence operations centre and vice versa for situational awareness and coordination in overlapping areas.

c. **Personnel recovery coordination cell.** The personnel recovery coordination cell plans, coordinates, conducts, and controls personnel recovery (PR) operations for theatre component commands and joint task force PR in assigned areas of operations through appropriately trained PR personnel.

d. **Force protection coordination cell.** The force protection coordination cell (FPCC) advises the CFACC or DCDR-Air on the effects and measures required to manage the risks posed by threats and hazards to the objectives and air assets, to meet their defined risk tolerance levels. This advice is based upon the operational imperatives, threats, hazards and asset values. The FPCC manages force protection (FP) related risks, on behalf of the CFACC, and is responsible for the operational-level planning and coordination of air FP effects and measures, including chemical, biological, radiological and nuclear defence, across the JOA. The FPCC maintains close liaison with the FP staff at SACEUR's or the joint commander's headquarters (HQ), other CCs and subordinate HQ as well as with the appropriate host nation facilities.

e. **Geospatial, meteorological and oceanographic support.** Geospatial, meteorological and oceanographic (GeoMetOc) information and knowledge, including space weather effects, are critical to commanders' situational understanding, operational risk management and decision making. NATO commanders, planners, and operators anticipate, mitigate, and exploit GeoMetOc effects on friendly and adversary capabilities to optimize the employment of NATO air and space capabilities and marginalize adversary capabilities to achieve advantage. GeoMetOc effects on adversary capabilities should be obtained via NATO intelligence sources. Designated GeoMetOc support is provided by GeoMetOc SMEs. They provide operational GeoMetOc information and tailored products in support of NATO air and space

operations, including but not limited to geospatial, meteorological, oceanographic, space weather and climatological information. Specific GeoMetOc effects information and knowledge may also be inputted into NATO planning and C2 systems.[80]

B.9 **Airlift coordination centre.** The ALCC plans, coordinates, executes and controls AT operations within the JOA. It works in concert with the JFAC director to ensure airlift effectiveness in the air assessment, planning, and execution process. ALCC responsibilities normally include tasking and scheduling AT operations within the JOA based on SACEUR's or the joint commander's approved priorities for validated AT requirements, allocating slot times for arrival/departure of transport aircraft at airfields in the JOA in response to requests from nations or the appropriate commander, integrating AT activity with other operations, for example humanitarian and disaster relief operation flights, and publishing the AT schedule as a portion of the ATO.

B.10 **Intelligence, surveillance and reconnaissance division.** The ISRD provides the CFACC or DCDR-Air, NCS JFAC HQ or DCDR-Air CS and subordinate units with predictive and actionable intelligence, counter-intelligence and security information, intelligence, surveillance and reconnaissance (ISR) operations, and targeting in a manner that synchronizes with the air tasking cycle. The ISRD provides a common threat and targeting picture to inform the planning and execution of theatre-wide air operations. It provides information and analysis to support the measurement of the effectiveness of operations, conducts planning, monitors execution of airborne ISR operations and leads collection management activities. The ISRD coordinates with the CPD to dynamically adjust ISR plans as required and directs the CFACC or DCDR-Air distributed and reach-back ISR processes. The ISRD conducts dynamic ISR operations in close coordination with the current operations cell and supports the application of joint intelligence preparation of the operational environment (JIPOE). JIPOE is the analytical process used by joint intelligence organizations to produce intelligence estimates and other intelligence products in support of the joint commander's decision-making process. Units and the staff assist JIPOE through contributing to: initial preparation of the operating environment; target development; ISR strategy and planning; ISR employment and assessment; and providing current battle damage assessment.

B.11 **Combat service support division.** The combat service support division (CSSD) provides direct support to the NCS JFAC HQ or DCDR-Air CS and subordinate units; produces, coordinates and executes sub-area plans to sustain mission requirements and facilitates the achievement of CFACC or DCDR-Air objectives. CSSD is broken out into four functional sub-areas (branches): personnel; logistics; communications; and finance.

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[80] See Allied Joint Publication-3.11, *Allied Joint Doctrine for Meteorological and Oceanographic Support to Joint Forces*.

a. **Personnel branch.** The personnel branch produces the NCS JFAC HQ human resourcing list in accordance with the authorized crisis establishment, filling all authorized posts with qualified personnel, and develops a rotation plan when required.

b. **Logistics branch.** The logistics branch coordinates the logistics effort to enable and sustain the air plan by identifying logistics requirements, constraints, and limitations impacting the production of the air operations plan.

c. **Communications branch.** The communications branch plans reliable, robust, and sufficient theatre C2 and communication and information systems for the required mission.

d. **Finance branch.** The finance branch provides financial advice, operating and maintenance funds, management of allocated common funds and contracting services to support operational requirements.

B.12 **Air operations planning group.** The air operations planning group (AOPG) is not a division of the NCS JFAC HQ. The AOPG provides the NCS JFAC HQ with a flexible and tailored staff for speedy analysis and staffing of any task related to crisis planning. Rapid recall and assembly procedures, as well as a streamlined planning process are the keys to success in providing timely and appropriate output. The role of the AOPG is to develop, review, update and coordinate air plans required to successfully conduct any given operation. As well as operations planning, the AOPG coordinates, synchronizes, and integrates all other activities related to the development of CFACC or DCDR-Air plans, policy and orders, e.g., branch plans and sequels.

The NATO Command Structure joint force air component headquarters transition[81]

B.13 **Planned transition.** The NCS JFAC HQ should develop a plan for the transition of NCS JFAC HQ duties to another component or location. Planned NCS JFAC HQ transitions are possible as a function of build up or scale down of joint operations. During transition of CFACC or DCDR-Air responsibilities, the component passing responsibilities should continue monitoring joint air planning, tasking and control circuits, and remain ready to reassume CFACC or DCDR-Air responsibilities until the gaining HQ or component has achieved full operational capability.

B.14 **Unpredicted transition.** As a possible result of battle damage or major C2 equipment failure, a smooth transition is unlikely. Therefore, SACEUR or the joint commander should pre-designate alternative locations (both inter and intra-component) and establish pre-

[81] Headquarters Allied Air Command Handover-Takeover SOP 29 Oct 2019, provides guidance for the transfer of air command and control and authorities, from a non-NATO Command Structure joint force air component headquarters/air operations centre to the NATO air command and control organizations, maintaining the momentum of ongoing air operations without disruption of the command and control of forces.

planned responses and options to the temporary or permanent loss of primary NCS JFAC HQ capability. Frequent backup and exchange of databases is essential to facilitate a rapid resumption of operations should an unplanned transition occur.

B.15 **Transition events.** The following events may cause CFACC or DCDR-Air responsibilities to shift.

a. Coordination requirements related to the planning and execution of the ATO exceeds CFACCs capability.

b. Build-up or relocation of forces shifts preponderance of the air forces and the ability to effectively plan, task and control air operations to another CC and SACEUR or the joint commander decides that the other component is in a better position (location, C2 capability or other considerations) to accomplish CFACC or DCDR-Air responsibilities.

c. Command, control, communications, computers and intelligence capability becomes unresponsive or unreliable.

B.16 **Transition considerations.** Considerations to aid in NCS JFAC HQ transition planning and decisions include:

a. Implementation of a core air command and control (C-AC2) capability. The C-AC2 is an internal C2 element, comprising of HQ AIRCOM SME's, to develop a deterrence based ATO. The C-AC2 can be activated without North Atlantic Council approval and is scalable to Commander AIRCOM requirements;

b. Continuous, uninterrupted and unambiguous direction and guidance for air operations;

c. Appropriate communications system support capabilities to ensure that the shift of CFACC or DCDR-Air duties is as transparent to the other component commands as possible;

d. The provision of specific procedures to coordinate and execute planned and unplanned shifts of CFACC or DCDR-Air in the air operations plan;

e. The availability of adequate communications, connectivity, human resourcing, intelligence support and C2 capability in the relieving component prior to assuming CFACC or DCDR-Air responsibilities;

f. Management of the current AOD, ACO, force disposition, adversary situation and order of battle;

g. The strategic and operational objectives to conduct air operations;

h. The ability to establish timely, reliable and secure communications links with all appropriate coordination cells to facilitate continuous and dynamic exchange of information;

i. Complete familiarity with the air and missile defence plan and ACP; and

j. Completion and retention of current databases to expedite the transition.

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Annex C - Joint force air component air command and control elements

The (deployable) air control centre/recognized air picture production centre/sensor fusion post and the (deployable) control and reporting centre[82]

C.1 **Introduction.** The (deployable) air control centre/recognized air picture production centre/sensor fusion post (D)ARS and the (deployable) control and reporting centre (D)CRC are ground-based integrated command and control (C2) elements of the air surveillance and control system. They may be fixed or deployed, and can be provided by an Alliance, coalition, as a combined element, or by a single nation. One or more radars are connected to the (D)ARS/D(CRC), one of which may be collocated. Subordinate to the joint force air component headquarters (JFAC HQ), and horizontally integrated with tactical C2 and intelligence, surveillance and reconnaissance (ISR) elements, (D)ARS/D(CRC) personnel are responsible for the decentralized execution of air defence (AD) and airspace control as well as supporting offensive air operations in a geographic sector assigned by the NATO Command Structure (NCS) JFAC HQ. In times of crisis or conflict, (D)ARS/(D)CRC manage all defensive air, offensive air, and airspace management activities within their assigned operational area through surveillance, identification, systems control, positive and procedural airspace control, and datalink management. The Combined Force Air Component Commander (CFACC) may delegate tactical battle management functions to subordinate units. (D)ARS/(D)CRC are established to: produce the recognised air picture (RAP); control assigned weapon systems; prepare and execute tasked missions; provide guidance and control to AD weapon systems; implement the ordered readiness posture; react to execution orders, and report mission results to the NCS JFAC HQ. The three key components of the (D)ARS[83] are outlined in the following paras.

C.2 **Air control centre.** An air control centre is a real-time battle management component. Its personnel perform air mission control for manned and unmanned aircraft and surface-based air and missile defence (SBAMD) within a designated geographical area. It can be delegated single or multiple tactical battle management functions by the CFACC for mission execution. This could include SBAMD readiness and employment control. It may also provide limited air traffic control (ATC) services, coordinate the minute-to-minute air battle with maritime forces afloat and/or army ground-air operations, and can also provide tactical, navigational and emergency assistance to aircraft.

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[82] A control and reporting centre has similar capabilities and functions as an air control centre/recognized air picture production centre/sensor fusion post.

[83] As NATO is transitioning from a control and reporting centre to an air control centre/recognized air picture production centre/sensor fusion post construct, just (deployable) air control centre/recognized air picture production centre/sensor fusion post will be considered here.

C.3 **Recognized air picture production centre.** A recognized air picture production centre (RPC) produces a RAP, thus contributing to a common operational picture (a composite of the sea, land and air surveillance pictures). Its personnel manage the employment of surveillance assets within their assigned area. An area air picture is established by correlating the local air picture from the sensor fusion post (SFP) with tracks and surveillance data received from external sources.

C.4 **Sensor fusion post.** The SFP develops a local air picture through the fusion of data from active and passive sensors. They also report on the status and performance of subordinate sensors, control sensor detection and respond to anti-radiation missile threats and electromagnetic countermeasures activity. Additionally, they manage and distribute all data coming from ATC radars to the RPC.

Airborne early warning and control

C.5 Airborne early warning and control (AEW&C) aircraft, such as the NATO E-3A airborne warning and control system are flexible, integrated, air surveillance C2 high-value air assets, capable of enhancing situational awareness of air and/or surface activity in the engagement space while simultaneously providing C2 capabilities. With their active/passive sensors and tactical datalink capabilities, AEW&C systems provide a real-time, accurate, all altitude air and surface picture beyond the coverage of ground- and/or surface-based radars. and can contribute to the compilation of the recognized air and surface picture. Additionally, as an effective C2 platform, they may provide air battle management capabilities and support to various air operational missions across all four air power roles.

Officer commanding

C.6 To ensure 24/7 C2 functionality and situational awareness, the officer commanding (OC) is tasked to monitor and/or supervise the execution of standing peacetime activities within the CFACC's area of responsibility. The activities include ballistic missile defence (BMD), air policing and operational control of NATO airborne early warning and NATO ISR capabilities. The OC is also responsible for operational reporting to other components.

Ballistic missile defence operations centre

C.7 NATO BMD is related to NATO European territorial defence. The ballistic missile defence operations centre (BMDOC) forms part of Allied Air Command HQ. The BMDOC performs the management and control of the NATO BMD force. Close coordination and information exchange is essential between the BMDOC and NCS JFAC HQ for any possible integrated air and missile defence activity.

Wing operations centre

C.8 The wing operations centre (WOC) performs continuous coordination between the wing and the NCS JFAC HQ (also the air operations coordination centre (AOCC) and/or air support operations centre, if tasking authority is delegated) or between the wing and the

squadrons. Feasibility of tasking is to be verified throughout the mission preparation process. The tasking is to be adjusted for additional mission relevant information and within the wing's capabilities and capacities in coordination with the tasking authority. Mission launch schedules are generated, and missions are assigned to individual squadrons or to individual aircraft. The WOC monitors and ensures mission result reporting and provides continuous near real-time status information to the NCS JFAC HQ or the Deputy Commander Air combined staff and associated air control centre / recognized air picture production centre / SFP.

Squadron operations centre

C.9 The squadron operations centre (SqOC) performs continuous coordination with the WOC for final mission preparation. The SqOC is responsible for the preparation of assigned missions, their timely execution, and the reporting of mission results through the WOC to the air control centre/RPC/SFP and NCS JFAC HQ.

Surface-based air and missile defence operations centre

C.10 The surface-based air and missile defence operations centre (SBAMDOC) performs management and control of SBAMD weapons systems at the tactical level and provides continuous near real-time SBAMD status information to the air control centre and, therefore, to the NCS JFAC HQ, and the AOCC (when providing support to ground forces). A SBAMDOC is normally deployable but may be implemented at static installations.

Tactical air control parties

C.11 Tactical air control parties (TACP) are designed to provide air liaison to land forces and for the control of aircraft. They are staffed with air liaison officers and/or joint terminal attack controllers (JTAC) to conduct liaison and control functions. This task may also be executed by a forward air controller (airborne) (FAC(A)), which however may not necessarily be part of a TACP.

Forward air controller airborne

C.12 A FAC(A) is a specifically certified and qualified aircrew member who exercises terminal attack control (TAC) while airborne and engaged in close air support. The FAC(A) role is an airborne extension of the TACP/JTAC. If permitted by military regulations, FAC(A)s can serve as an additional TAC capability for the TACP/JTAC or augment and extend the acquisition range of forward observers. The FAC(A) mission is normally accomplished by a fixed-wing aircraft (fighter or attack) or rotary-wing aircraft (attack) operating either as a single-ship or two ship. FAC(A) aircraft carry equipment and munitions to aid in their role. FAC(A)s can also perform radio relay, reconnaissance, indirect fires call-for-fire, asset coordination and deconfliction, battle damage assessment, target marking, designation and coordinate generation as well as conducting TAC.

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Lexicon

Part 1 – Acronyms and abbreviations

The Lexicon contains abbreviations relevant to Allied Joint Publication (AJP)-3.3, *Allied Joint Doctrine for Air and Space Operations* and is not meant to be exhaustive. A more comprehensive list of abbreviations is in the NATOTerm database. This database is updated regularly and should therefore be consulted for the most up-to-date terminology.[84]

AAR	air-to-air refuelling
AAW	anti-air warfare
ACA	airspace control authority
ACCE	air component coordination element
ACM	airspace control means
ACO	airspace control order
ACP	airspace control plan
AD	air defence
AEW&C	airborne early warning and control
AI	air interdiction
AIRCOM	Allied Air Command
AJP	Allied joint publication
ALCC	airlift coordination centre
ALE	air liaison element
AMD	air and missile defence
AMDC	air and missile defence commander
AOAB	air operations assessment branch
AOCC	air operations coordination centre
AOD	air operations directive
AOLRT	air operational liaison and reconnaissance team
AOO	area of operations
AOP	air operations plan
AOPG	air operations planning group
AOR	area of responsibility
ASOC	air support operations centre
ASUW	antisurface warfare
ASW	antisubmarine warfare
AT	air transport
ATC	air traffic control
ATO	air tasking order
ATP	Allied tactical publication

[84] Available at https://nso.nato.int/natoterm.

BACO	baseline activities and current operations
BLOS	beyond line-of-sight
BMD	ballistic missile defence
BMDOC	ballistic missile defence operations centre
C-AC2	core air command and control
C2	command and control
C4IS	command, control, communications, computers and information systems
CAOC	combined air operation centre
CAS	close air support
CC	component command
CFACC	Combined Force Air Component Commander
CFLCC	Combined Force Land Component Commander
CFSpCC	Combined Force Space Component Commander
CG	command group
CIS	communication and information systems
COA	course of action
COD	combat operations division
COM AIRCOM	Commander Allied Air Command
CONOPS	concept of operations
CPD	combat plans division
CRC	control and reporting centre
CS	combined staff
CSSD	combat service support division
D&G	direction and guidance
DACCC	Deployable Air Command and Control Centre Poggio Renatico
D-AOC	deployable air operations centre
DCA	defensive counter-air
DCDR-Air	Deputy Commander Air
DCDR-Air CS	Deputy Commander Air combined staff
DPS	data, products, services
EA	electromagnetic attack
ED	electromagnetic defence
EME	electromagnetic environment
EMS	electromagnetic spectrum
ES	electromagnetic surveillance
EW	electromagnetic warfare
FAC(A)	forward air controller (airborne)
FP	force protection
FPCC	force protection coordination cell

GAT	guidance, apportionment and targeting
GeoMetOc	geospatial meteorological and oceanographic
GLE	ground liaison element
HQ	headquarters
IACB	information activities coordination board
ISR	intelligence, surveillance and reconnaissance
ISRD	intelligence, surveillance and reconnaissance division
JACC	joint airspace coordination centre
JCB	joint coordination board
JCMB	joint collection management board
JCMWG	joint collection management working group
JCO	joint coordination order
JEST	joint effects synchronization team
JFAC	joint force air component
JFC	Joint Force Command
JIPOE	joint intelligence preparation of the operating environment
JISR	joint intelligence, surveillance and reconnaissance
JOA	joint operations area
JPDAL	joint prioritized defended asset list
JPRC	joint personnel recovery centre
JPTL	joint prioritized target list
JTAC	joint terminal attack controller
JTCB	joint targeting coordination board
JTL	joint target list
JTWG	joint targeting working group
LEGAD	legal advisor
LCC	land component command
LO	liaison officer
LOAC	law of armed conflict
MAOC	maritime air operations centre
MAOP	master air operations plan
MCC	maritime component command
MTOW	maximum take-off weight
NAC	North Atlantic Council
NATO	North Atlantic Treaty Organization
NCS	NATO Command Structure
NCS JFAC	NATO Command Structure joint force air component
NFS	NATO force structure
NFS JFAC HQ	NATO force structure joint force air component headquarters

NGO	non-governmental organization
NK	non-kinetic
NKATT	non-kinetic analysis and targeting team
NKO	non-kinetic operations
NKOT	non-kinetic operations team
NKPT	non-kinetic plans team
NKST	non-kinetic strategy team
NSL	no-strike list
OC	officer commanding
OCA	offensive counter-air
OPCON	operational control
OPLAN	operation plan
OPTASK LINK	operational tasking data link
OSS	operational space support
PNT	positioning, navigation and timing
PR	personnel recovery
PRCC	personnel recovery coordination cell
PTL	prioritized target list
RAP	recognised air picture
ROE	rules of engagement
RPC	recognized air picture production centre
SACEUR	Supreme Allied Commander Europe
SATCOM	satellite communications
SBAMD	surface-based air and missile defence
SBAMDOC	surface-based air and missile defence operations centre
SD	strategy division
SDA	space domain awareness
SDB	strategy development branch
SDC	space domain coordination
SEAD	suppression of enemy air defences
SEW	shared early warning
SFP	sensor fusion post
SICC	strategy integration and coordination cell
SIGINT	signals intelligence
SLE	space liaison element
SME	subject matter expert
SOF	special operations forces
SOLE	special operations liaison element
SOP	standing operating procedures
SpSCE	space support coordination element
SPINS	special instructions

SqOC	squadron operations centre
SSA	space situational awareness
StratCom	strategic communications
STT	strategy to task
TAC	terminal attack control
TACP	tactical air control party
TBMD	theatre ballistic missile defence
TCC	theatre component command
TCCC	Theatre Component Command Commander
TST	time-sensitive targets
TSpC	theatre space component
TTP	tactics, techniques and procedures
UA	unmanned aircraft
UAS	unmanned aircraft system
WOC	wing operations centre

Part 2 – Terms and definitions

The Lexicon contains definitions relevant to Allied Joint Publication (AJP)-3.3, *Allied Joint Doctrine for Air and Space Operations* and is not meant to be exhaustive. The NSO NATO*Term* database contains the definitive list of definitions.

active air and missile defence
Active measures taken against attacking enemy forces to destroy or nullify any form of air or missile threat or to reduce the effectiveness of any such attack.
(NATO Agreed)

air superiority
That degree of dominance in the air battle of one force over another which permits the conduct of operations by the former and its related land, sea and air forces at a given time and place without prohibitive interference by the opposing force.
(NATO Agreed)

air supremacy
That degree of air superiority wherein the opposing air force is incapable of effective interference.
(NATO Agreed)

allocation
The translation of the apportionment into total numbers of sorties by aircraft type available for each operation or mission.
(NATO Agreed)

allotment
The temporary change of assignment of tactical air forces between subordinate commands. The authority to allot is vested in the commander having operational command.
(NATO Agreed)

apportionment
The quantification and distribution by percentage of the total expected effort, in relation to the priorities which are to be given to the various air operations in geographic areas for a given period.
(NATO Agreed)

air support operations centre
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.
(NATO Agreed)

battle damage assessment
The timely and accurate assessment of damage resulting from the application of lethal or non-lethal force against an entity.
(NATO Agreed)

campaign
A set of military operations planned and conducted to achieve a strategic objective.
(NATO Agreed)

centre of gravity
The primary source of power that provides an actor its strength, freedom of action and/or will to fight.
(NATO Agreed)

combined
Adjective used to describe activities, operations and organizations, in which elements of more than one nation participate.
(NATO Agreed)

component command
1. In the NATO military command structure, a command organization with specific capabilities that is responsible for operational planning and conduct of assigned operations.
(NATO Agreed)

2. A functional component command or environmental component command responsible for the planning and conduct of a maritime, land, air, special or other operation as part of a joint force.
(NATO Agreed)

component commander
A designated commander responsible for the planning and conduct of a maritime, land, air, special or other operation as part of a joint force.
(NATO Agreed)

concept of operations
A clear and concise statement of the line of action chosen by a commander in order to accomplish his given mission.
(NATO Agreed)

control
The authority exercised by a commander over part of the activities of subordinate organizations, or other organizations not normally under their command, encompassing the responsibility for implementing orders or directives.
(NATO Agreed)

course of action
In the estimate process, an option that will accomplish or contribute to the accomplishment of a mission or task, and from which a detailed plan is developed.
(NATO Agreed)

doctrine
Fundamental principles by which the military forces guide their actions in support of objectives. It is authoritative but requires judgement in application.
(NATO Agreed)

end state
The political-strategic statement of conditions that defines an acceptable concluding situation to be attained at the end of a strategic engagement.
(NATO Agreed)

engagement space
The part of the operating environment where actions and activities are planned and conducted.
(NATO Agreed)

force protection
All measures and means to minimize the vulnerability of personnel, facilities, materiel, operations, and activities from threats and hazards to preserve freedom of action and operational effectiveness of the force, thereby contributing to mission success.
(NATO Agreed)

friendly fire
The employment of friendly weapons or munitions with intent to engage the enemy resulting in the unforeseen and unintentional injury or death of friendly personnel or destruction of property.
(NATO Agreed)

host nation
A country that, by agreement:
1. receives forces and materiel of NATO member states or other countries operating on/from or transiting through its territory;
2. allows materiel and/or NATO and other organizations to be located on its territory; and/or
3. provides support for these purposes.
(NATO Agreed)

intelligence
The product resulting from the directed collection and processing of information regarding the environment and the capabilities and intentions of actors, in order to identify threats and offer opportunities for exploitation by decision-makers.
(NATO Agreed)

joint
Adjective used to describe activities, operations and organizations in which elements of at least two services participate.
(NATO Agreed)

joint air power
The ability to coordinate, control, and exploit the Air domain in the pursuit of Alliance objectives.
(NATO Agreed)

joint operations area
A temporary area within a theatre of operations defined by the Supreme Allied Commander Europe, in which a designated joint force commander plans and executes a specific mission at the operational level.
(NATO Agreed)

mission
1. What the system is supposed to accomplish in response to the stated operational requirement.
(AAP-45 (not NATO Agreed))

2. One or more aircraft ordered to accomplish one particular task.
(NATO Agreed)

multinational
Adjective used to describe activities, operations and organizations, in which elements of more than one nation participate.
(NATO Agreed)

operation
1. A sequence of coordinated actions with a defined purpose.
(NATO Agreed)

2. A well-defined action that, when applied to any permissible combination of known entities, produces a new entity.
(NATO Adopted)

operation plan
A plan for a single or series of connected operations to be carried out simultaneously or in succession.
Notes:
1. It is the form of directive employed by higher authority to permit subordinate commanders to prepare supporting plans and orders.
2. The designation 'plan' is usually used instead of 'order' in preparing for operations well in advance.

3. An operation plan may be put into effect at a prescribed time, or on signal, and then becomes the operation order.

(NATO Agreed)

operational command
The authority granted to a commander to assign missions or tasks to subordinate commanders, to deploy units, to reassign forces, and to retain or delegate operational and/or tactical command and/or tactical control as the commander deems necessary. Note: Operational command does not include responsibility for administration.
(NATO Agreed)

operational control
The authority delegated to a commander to direct assigned forces to accomplish specific missions or tasks that are usually limited by function, time, or location; to deploy units concerned, and to retain or assign tactical command or control of those units. Note: operational control does not include authority to assign separate employment of components of the units concerned and does not include administrative and logistic control.
(NATO Agreed)

passive air and missile defence
Passive measures taken for the physical defence and protection of personnel, essential installations and equipment in order to minimize the effectiveness of air and/or missile attack.
(NATO Agreed)

personnel recovery
The sum of military, diplomatic and civil efforts to effect the recovery and reintegration of isolated personnel.
(NATO Agreed)

rules of engagement
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)

supported commander
A commander having primary responsibility for all aspects of a task assigned by a higher NATO military authority and who receives forces or other support from one or more supporting commanders.
(NATO Agreed)

tactical command
The authority delegated to a commander to assign tasks to forces under their command for the accomplishment of the mission assigned by higher authority, and to retain or delegate tactical control of units.
(NATO Agreed)

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

targeting
The process of selecting and prioritizing targets and matching the appropriate response to them, taking into account operational requirements and capabilities.
(NATO Agreed)

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