



Ministry  
of Defence

## Joint Doctrine Note 1/16

# Air Manoeuvre



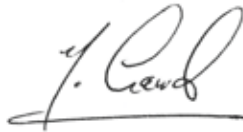
Development, Concepts and Doctrine Centre



# Joint Doctrine Note 1/16

## Air Manoeuvre

Joint Doctrine Note (JDN) 1/16, dated September 2016,  
is promulgated as directed by the Chiefs of Staff

A handwritten signature in black ink, appearing to read 'J. C. C. C.', with a horizontal line underneath.

Head Doctrine

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# Preface

## Purpose

1. Air manoeuvre is a joint activity. Joint Doctrine Note (JDN) 1/16, *Air Manoeuvre* aims to enable the single Services to develop their own doctrine, which should be coherent with each others so we can enhance our air manoeuvre capability. This JDN will:

- propose a definition for air manoeuvre;
- outline the activities and force elements that constitute air manoeuvre; and
- provide some specific considerations for planning and execution.

## Context

2. Army Doctrine Publication (ADP), *Operations* describes land manoeuvre as the combination of air and ground manoeuvre. With the possible exception of projecting amphibious forces ashore, air manoeuvre will be initiated and controlled by land forces. Air manoeuvre operations provide commanders with an ability to rapidly deploy light forces and support mechanised and armoured ground forces across the battlespace, either as part of land manoeuvre or as a means of projecting land power in its own right. It will remain an enduring requirement both tactically and operationally.<sup>1</sup> Effectively employing air manoeuvre requires understanding and practice. Air manoeuvre must also be instilled across the joint force.

3. This JDN is needed for several reasons. Air manoeuvre has a number of interpretations, many of which focus solely on using helicopters. However, these interpretations do not describe the full range of air manoeuvre activity, nor are they aligned with endorsed joint air terminology used to define joint air activities. It is important, therefore, to develop agreed terminology across the component commands on what constitutes air manoeuvre and how air manoeuvre activities should be conducted. This will reduce the potential for misunderstanding and confusion, and clarify how air manoeuvre contributes to operations.

.....  
1 Joint Concept Note (JCN) 3/12, *Future Air and Space Operating Concept*, paragraph 321 and JCN 2/12, *Future Land Operating Concept*, paragraphs 425 to 427 and 471.

## Audience

4. JDN 1/16, *Air Manoeuvre* is aimed at commanders and their staff for planning and executing air manoeuvre operations. This includes maritime, land, air and space, and special forces operations.

## Structure

5. JDN 1/16 is divided into six chapters.
- a. Chapter 1 introduces air manoeuvre, its relation to Defence policy, terminology, characteristics and fundamentals.
  - b. Chapter 2 covers the outline roles and capabilities of helicopters, fixed-wing transport systems and light forces.
  - c. Chapter 3 suggests uses for air manoeuvre.
  - d. Chapter 4 details operational considerations for air manoeuvre.
  - e. Chapter 5 outlines broad considerations for conducting air manoeuvre in the land environment.
  - f. Chapter 6 outlines considerations for conducting air manoeuvre in the littoral environment.

## Linkages

6. This JDN should be read alongside a number of publications to provide wider context. These include:

- Allied Joint Publication (AJP)-3.2, *Allied Joint Doctrine for Land Operations*;
- AJP-3.3(A), *Allied Joint Doctrine for Air and Space Operations*;
- Allied Tactical Publication (ATP)-3.2.1, *Allied Land Tactics*;
- ATP-49, *Use of Helicopters in Land Operations*;
- Joint Doctrine Publication (JDP) 0-30, *UK Air and Space Doctrine*;
- Air Publication 3002, *Air and Space Warfare*;

- *ADP, Operations;*
- *Army Field Manual (AFM), Volume 1, Part 12, Air Manoeuvre;*
- *Pamphlet 101, Army Aviation Operations Manual;*
- *Doctrine Note 15/01, Integrated Action;*
- *Doctrine Note 15/02, Airmobile Operations;*
- *Royal Navy Book of Reference (digital) 4487, Amphibious Warfare; and*
- *US Army Field Manual 3-99, Airborne and Air Assault Operations.*





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# Introduction

Chapter 1 introduces air manoeuvre, its relation to Defence policy, terminology, characteristics and fundamentals.

Section 1 – Terminology . . . . .3

Section 2 – Air manoeuvre characteristics and  
fundamentals . . . . .5

“

For fear of dropping the troops in the sea, the pilots tended to drop them **too far inland** – some of them actually in the British lines. The weapon containers often **fell wide of the troops**, which was another **handicap** that contributed to our **excessive casualties**.

”

Kurt Student

# Chapter 1 – Introduction

1.1. The capabilities offered by air manoeuvre forces have significant applicability to Defence Tasks 1, 4 and 5<sup>1</sup> in providing options for rapid intervention by land and littoral forces over battlefield, intra- and inter-theatre distances. Allied Joint Publication (AJP)-3.2, *Allied Joint Doctrine for Land Operations* highlights the role of air manoeuvre forces within the land force. This is echoed in Joint Doctrine Publication (JDP) 3-00, *Campaign Execution*, which lists air manoeuvre forces as one of three types contributed by land forces; the others being ground manoeuvre and reconnaissance forces.

1.2. JDP 0-01, *UK Defence Doctrine* highlights the growing importance of the role our Armed Forces can play in contributing to deterrence and coercion. Rapidly deployable air manoeuvre forces provide a capable, credible and deliverable air landed force at readiness and are therefore a vital source of UK power and influence.

## Section 1 – Terminology

1.3. JDP 0-10, *British Maritime Doctrine* does not define air manoeuvre. However, air manoeuvre does fall under the auspices of littoral manoeuvre.<sup>2</sup> JDP 0-30, *UK Air and Space Doctrine*'s description of air manoeuvre is derived from land doctrine.<sup>3</sup> Our proposed definition for air manoeuvre is:

**the movement of forces through the air to positions of advantage  
from which force can be applied or threatened.**

1 *Defence Strategic Direction 2016*, outlines Defence Tasks as follows: 1 – Defence security and resilience of the Homeland and Overseas Territories; 4 – Influence through international Defence Engagement; and 5 – Overseas Defence activity.

2 Air manoeuvre is a component of ship to objective manoeuvre; itself a component of littoral manoeuvre.

3 Joint Doctrine Publication (JDP) 0-30, *UK Air and Space Doctrine*, states that air manoeuvre refers to those operations, conducted principally within the land tactical battlespace, aimed at achieving decisive advantage through exploiting the third dimension, within a joint framework as part of an integrated approach.

1.4. Air manoeuvre employs fixed- and rotary-wing aircraft, airborne, air assault, airmobile and amphibious forces. These are integrated with intelligence, surveillance and reconnaissance, fires and ground forces to significantly increase the tempo and reach of the land or maritime component. Air manoeuvre can be divided into three activity areas.

- a. **Airborne forces.** An airborne force is defined as: a force composed primarily of ground and air units organized, equipped and trained for airborne operations.<sup>4</sup>
- b. **Air assault and airmobile operations.** Air assault and airmobile operations are specifically designed to be inserted, resupplied and extracted using support and attack helicopters as their normal means of operation.
- c. **Independent helicopter tasks.** Independent helicopter tasks are those tasks carried out by helicopters independent of other arms. However, these tasks may be linked to a broader scheme of manoeuvre.

1



Royal Air Force C-130J Hercules can be used in airborne operations

.....  
4 Allied Administrative Publication (AAP)-06, *NATO Glossary of Terms and Definitions*.

1.5. Aviation has been incorrectly used as the collective noun for helicopters and associated activities.<sup>5</sup> However, it is not defined as such in Allied Administrative Publication (AAP)-06, *NATO Glossary of Terms and Definitions*; AJP-3.3, *Allied Joint Doctrine for Air and Space Operations*; or JDP 0-30, *UK Air and Space Doctrine*. Aviation accommodates all aircraft; fixed-wing, tilt rotor and helicopters. This Joint Doctrine Note (JDN) proposes that the collective noun 'aviation' is replaced with 'helicopters', which accommodates maritime and battlefield helicopters.

## Section 2 – Air manoeuvre characteristics and fundamentals

### Air manoeuvre characteristics

1.6. Air manoeuvre forces exploit the core attributes of air power – height, reach and speed.<sup>6</sup> This provides many benefits to a land or amphibious force with an air manoeuvre capability. Height and reach enables access over difficult terrain and ground barriers. Combining speed with reach increases tempo and can give the advantage of surprise. The agility of helicopters allows an air manoeuvre force to move quickly between tactical actions. This enables them to exploit more opportunities than ground forces can alone.<sup>7</sup>

//

The agility of helicopters allows an air manoeuvre force to move quickly between tactical actions.

//

.....  
5 This is an inter-Service taxonomy issue. Allied Tactical Publication (ATP)-49, *The Use of Helicopters in Land Operations*; ATP-3.2.1, *Allied Land Tactics* and US Army Field Manual 3-99, *Airborne and Air Assault operations* all use 'aviation' to mean helicopters. Additionally, Joint Helicopter Command (JHC) use 'army aviation' to cover helicopters and fixed-wing aircraft.

6 *Op. Cit.*, JDP 0-30.

7 Army Doctrine Publication (ADP), *Operations*, pages 4-9 and Commander JHC's strawman paper, *Air manoeuvre in the land environment*, June 2015, paragraph 4.

1.7. Although offering significant advantages, air manoeuvre forces can also be vulnerable both in flight and on the ground. They often lack persistence; aircraft have a limited loiter time and troops are lightly armed and equipped with limited means of resupply. Therefore, logistic demands created by air manoeuvre forces are challenging.

## Air manoeuvre fundamentals

1.8. Having a common objective will provide the foundation for mission success. To achieve this, the air manoeuvre force should:

1

- have a unified purpose;
- have clearly defined objectives;
- have effective command and control across the joint force and conduct planning and battlespace management jointly;
- have sufficient/temporary control of the air;
- have timely, accurate and specific intelligence;
- be able to deliver sufficient mass in the initial wave<sup>8</sup> and concentrate force;
- be able to achieve surprise;
- be able to sustain, reinforce, withdraw or exploit the opportunities created by air manoeuvre; and
- be able to train and develop familiarity with equipment and procedures.

.....  
8 PR Syms, *Air manoeuvre historical analysis*, Dstl, 31 July 2015, found that for battlegroup air manoeuvre operations, the larger the body of troops used, the greater the success rate. Delivery through waves rather than *en-masse* reduces surprise. Single wave battlegroup delivery offers the best chance of success for both airdrop and air assault operations. This is restricted in the UK by available transport aircraft and helicopters to a sub-battlegroup delivery option.



### Key points

- Rapidly deployable air manoeuvre forces provide a capable, credible and deliverable air landed force at readiness and are therefore a vital source of UK power and influence.
- Air manoeuvre employs fixed- and rotary-wing aircraft, airborne, air assault, airmobile and amphibious forces.
- Air manoeuvre forces exploit the core attributes of air power – height, reach and speed.
- The agility of helicopters allows an air manoeuvre force to move quickly between tactical actions.
- Although offering significant advantages, air manoeuvre forces can also be vulnerable both in flight and on the ground.
- Having a common objective will provide the foundation for mission success.
- Logistic demands created by air manoeuvre forces are challenging.



## Roles and capabilities

Chapter 2 covers the outline roles and capabilities of helicopters, fixed-wing transport systems and light forces.

- Section 1 – Helicopters . . . . .11
- Section 2 – Fixed-wing transport aircraft . . . . .15
- Section 3 – Light forces . . . . .16

//

The helicopter is **evidence** of  
how **man's imagination** can be  
given **physical form**.

//

Howard A. Wheeler

# Chapter 2 – Roles and capabilities

## Section 1 – Helicopters

2.1. Battlefield helicopters are designed for, and employed primarily in, the land environment.<sup>9</sup> Agility and mobility characterise the main roles of battlefield helicopters. Agility allows helicopters to quickly move between tactical actions. Mobility allows helicopters to rapidly move tactically and operationally, regardless of conditions on the ground. Additionally, adaptability allows helicopters with their agility to quickly re-role for different tasks.

2.2. Battlefield helicopters have three main roles.<sup>10</sup> These are:

- lift;
- find; and
- attack.

These three roles can be applied across all four types of tactical actions within the land<sup>11</sup>/maritime environment – offensive, defensive, stabilising and enabling.

2.3. Helicopters suited to the role of lift are best used in all tactical actions that require moving cargo or personnel. This capability also covers air-enabled tactical casualty evacuation.<sup>12</sup> These helicopters are normally termed support helicopters.<sup>13</sup>

9 Battlefield helicopters have also been used in the past in the maritime environment, when required.

10 Some helicopters are also able to perform a command support function.

11 Army Doctrine Publication (ADP), *Operations*, 2010, paragraph 0821.

12 This falls within the broader role of air mobility, which lies at the heart of the UK's ability to achieve rapid effect. Allied Joint Publication (AJP)-4.10, *Allied Joint Doctrine for Medical Support* details casualty and medical evacuation. Joint personnel recovery is detailed in AJP-3.7, *Allied Joint Doctrine for Recovery of Personnel in a Hostile Environment*.

13 NATO uses the term utility helicopter instead of support helicopter and defines it as a **multi-purpose helicopter that may be armed**. Allied Administrative Publication (AAP)-06, *NATO Glossary of Terms and Definitions*.

2.4. Helicopters suited to the role of find are normally termed reconnaissance helicopters. They are best used to conduct:

- reconnaissance;
- framework security; and
- armed reconnaissance, in some circumstances.

Additionally, these helicopters can also be used to provide command support functions. During high-tempo operations, the commander can use these helicopters as a platform to move. This allows the commander to exercise command and control from the air. In some circumstances, battlefield reconnaissance helicopters can also perform airborne radio rebroadcast.

2.5. Helicopters suited to the role of attack are normally termed attack helicopters.<sup>14</sup> They are best used to conduct:

- attack;
- raid;
- exploitation;
- pursuit;
- ambush;
- security (through screen, guard, covering force or escort tasks); and
- armed reconnaissance in some instances.

2.6. Attack helicopters are also suited to controlling and directing firepower. This covers:

- directing indirect (and naval) fire as an air observation post;
- directing close air support as a forward air controller (airborne); and
- controlling and coordinating joint air attack team<sup>15</sup> operations.

.....  
14 Attack helicopter is defined as: a helicopter specifically designed to employ various weapons to attack and destroy enemy targets. AAP-06.

15 Joint air attack team is defined as: a combination of attack and/or reconnaissance rotary-wing aircraft and fixed-wing close air support aircraft, operating together to locate and attack high-priority targets and targets of opportunity. Joint air attack team operations are coordinated and conducted to support the ground commander's scheme of manoeuvre. AAP-06.



An Apache attack helicopter firing a Hellfire missile during an exercise conducted from HMS Ocean

2.7. Maritime helicopters are designed for, and employed primarily in, the maritime environment. The Royal Navy retains its own maritime helicopters for maritime force protection. They are not owned by the Joint Helicopter Command<sup>16</sup> and would not routinely be used in air manoeuvre. Maritime helicopters have three roles: airborne surveillance and control; anti-submarine warfare; and anti-surface warfare. The Sea King Airborne Surveillance and Control, Merlin Mk 2 and Wildcat/Lynx Mk 8 helicopters all contribute to the air manoeuvre fundamentals highlighted in Chapter 1.

2.8. The new helicopter-borne surveillance system, Crowsnest, will deliver: air surveillance and control to provide force protection to a maritime force; act as a tactical command and control platform; and provide battlespace management. It has a data link and radar, both of which contribute to defensive counter-air by providing control of combat air patrol aircraft and airborne early warning.

.....  
<sup>16</sup> A command under the Land Forces top level budget that has operational command of all battlefield helicopters.

2.9. Table 2.1 summarises the suitability of using the various helicopter types.

Type	Suitable for	Less suitable for
Lift	Internal and underslung loads Shuttling roles Moving personnel Air-enabled tactical casualty evacuation	Command support
Find	Intelligence, surveillance and reconnaissance (ISR) Controlling and directing fires Command support	Offensive action Lift
Attack	Offensive action Controlling and directing fires Some ISR capability	Command support
Airborne surveillance and control	ISR over land and water Command and control for movement of aircraft	Lift Moving personnel
Anti-submarine warfare	Anti-submarine warfare Surface reconnaissance Air-to-surface gunnery Third-party targeting	Lift Tactical flight in a non-benign land environment Non-hardened landing sites
Anti-surface warfare	Surface ISR and strike Weapon carriage for anti-submarine warfare	Lift Tactical flight in a non-benign land environment

Table 2.1 – Helicopter suitability



## Section 2 – Fixed-wing transport aircraft

2.10. Strategic air transport and tactical air transport are those fixed-wing aircraft directly employed in the air mobility role.<sup>17</sup> They have the characteristics of speed and reach;<sup>18</sup> however, there is always a trade-off between payload and range. Strategic air transport and tactical air transport fulfil the following roles within the scope of this publication.



The A400 can conduct strategic air transport

- a. **Airlift.** Airlift covers transporting and sustaining personnel and equipment inter- and intra-theatre. This will often link to support helicopter airlift activity and also includes resupply airdrop.
- b. **Airborne operations.** Airborne operations are operations that transport and sustain airborne forces by airdrop or air land delivery.
- c. **Aeromedical evacuation.** Aeromedical evacuation involves moving patients, under medical supervision, between medical treatment facilities. This may flow from tactical casualty evacuation conducted by helicopters.
- d. **Special air mobility operations.** Special air mobility operations are those activities undertaken to support special forces operations.

17 Air mobility is one of the four fundamental roles of air power. It is described as moving personnel, equipment or materiel to create strategic effects and enabling operational and tactical manoeuvre and sustainment. JDP 0-30, *UK Air and Space Doctrine*, paragraph 302.

18 *Ibid.*, paragraph 117.

2.11. Table 2.2 summarises the suitability of tactical and strategic air support.

Type	Suitable for	Less suitable for
Tactical air transport	Intra-theatre movement of personnel and materiel  Air landing operations on unprepared airfields	Inter-theatre movement of very large equipments
Strategic air transport	Inter-theatre movement of personnel and materiel	Air landing on unprepared airfields

Table 2.2 – Strategic air transport and tactical air transport employment

## Section 3 – Light forces

2.12. Army Doctrine Publication (ADP), *Operations* states that land forces consist of combat, combat support, combat service support and combat command support elements.<sup>19</sup> Combat forces are composed of reconnaissance, ground manoeuvre and air manoeuvre forces.

2.13. Ground manoeuvre forces are split into three types: armoured, mechanised and light. Once on the ground, the air manoeuvre force exhibits the strengths and weaknesses of a light force.

2.14. Light forces are combined arms groups formed around light infantry, but may be mechanised or armoured forces operating out of role. They are task-organised with combat support and combat service support. Light forces are optimised for operations in mountains, jungles, the littorals and dense urban areas. They fight dismounted, possibly with some light vehicles. Their firepower is limited compared to heavier forces, and they are vulnerable without the protection of dispersion, concealment or fortification.

<sup>19</sup> ADP, *Operations*, 2010, page 4-7 onwards.

2.15. Light forces can be deployed rapidly and are therefore suited to air manoeuvre operations. They will, however, usually require frequent resupply and support from joint fires and airlift aircraft. Light forces can be used in offensive, defensive, stabilising and enabling actions.<sup>20</sup>

- a. **Offensive actions.** Examples include: clearing strongholds; operations in remote or inaccessible terrain; and air manoeuvre operations to conduct guard, block/hold tasks.
- b. **Defensive actions.** Examples include: providing point and local area security; route security; and cordon-and-search.
- c. **Stabilising actions.** Examples include: route checking; vehicle checkpoints; cordons; raids; partnering and mentoring; and security patrolling.
- d. **Enabling actions.** Examples include: reconnaissance in complex terrain; advancing to contact an enemy force; and crossing rivers. Light forces can conduct these tasks in certain circumstances, and must be able to link up with other elements of the ground force.

### Key points

- Mobility allows helicopters to rapidly move tactically and operationally regardless of conditions on the ground.
- Battlefield helicopters have three main roles – lift, find and attack.
- Strategic air transport and tactical air transport are those fixed-wing aircraft directly employed in the air mobility role.
- Light forces can be deployed rapidly and are therefore suited to air manoeuvre operations.

<sup>20</sup> Offensive, defensive and stabilising actions are detailed in Army Field Manual, Volume 1, Part 2, *Battlegroup Tactics*, Chapter 1, Annex E. Enabling actions detailed in Allied Tactical Publication-3.2.1, *Allied Land Tactics*, page 8-1.



## Uses for air manoeuvre

Chapter 3 details the activity areas associated with air manoeuvre and looks at how air manoeuvre can be applied across the operational framework.

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“  
Battles are **won** by slaughter and manoeuvre. The **greater the general**, the more he **contributes in manoeuvre**, the less he demands in slaughter.  
”

Sir Winston Churchill

# Chapter 3 – Uses for air manoeuvre

3.1. Land manoeuvre is a combination of ground and air manoeuvre, enabled by manoeuvre support. It can be further enhanced by littoral manoeuvre. Synchronising ground, maritime and air manoeuvre within time and space can create a greater cumulative effect than when they operate separately. Increasing this synchronicity is key in maximising mission success. Air manoeuvre forces exploit the mobility of aircraft to provide reach and agility and, hence, speed of reaction. Air manoeuvre may allow forces to rapidly deploy into theatre directly from the UK. This gives the UK a rapid pre-emptive capability, which can create a deterrence effect.

3.2. Figure 3.1 shows the range of air manoeuvre operations that can be undertaken over inter-theatre to battlefield distances. Airborne operations can be used for theatre entry, which is one of a number of options that can create a rapid effect over inter-theatre distances. However, all air manoeuvre operations have applicability over intra-theatre and battlefield distances. Air assaults can cover significant distances if resourced effectively and small parachute or air landing operations can be tactically focussed. Air manoeuvre operations apply to both the land and littoral environments. Air manoeuvre in the littoral routinely accommodates air assault, air mobile and independent helicopter tasks.

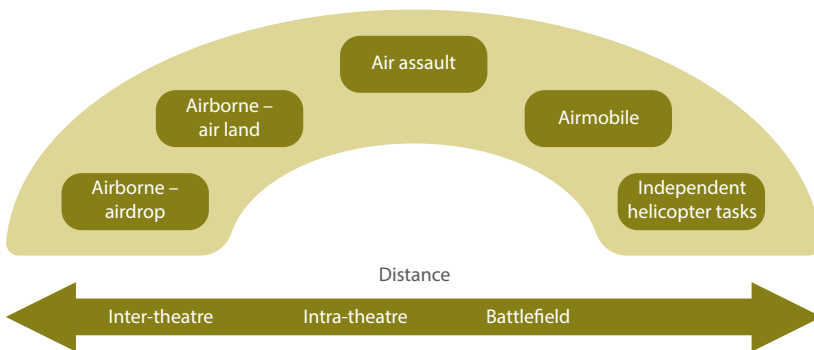


Figure 3.1 – Air manoeuvre spectrum

### Operation BARKHANE

Operation BARKHANE is a French anti-terrorist operation spanning Africa's Sahel region. From 7 to 13 April 2015, during Operation KOUNAMA 2, French forces conducted an offensive reconnaissance operation in the 'three borders' region of northern Niger. This was launched by a company-level airborne operation over the Salvador Pass. Ninety parachutists linked up with a ground force of around 50 French soldiers and 30 Niger soldiers from Madama. Several insurgent logistics sites were found and destroyed.

Subsequent operations, KOUNAMA 4 (20 July – 1 August) and KOUNAMA 5 (19 – 29 August) also featured company-level parachute operations linking up with a ground force to disrupt insurgent lines of communication.

[www.defense.gouv.fr](http://www.defense.gouv.fr)

3

## Section 1 – Air manoeuvre activity areas

3.3. In Chapter 1, the three activities of air manoeuvre (airborne forces, air assault/airmobile operations and independent helicopter tasks) were introduced. Airborne operations cover both airdrop and air land operations and is defined as: **an operation involving the movement of combat forces and their logistic support into an objective area by air.**<sup>21</sup> Airborne operations are carried out by airborne<sup>22</sup> forces – those trained to operate in this role.

21 Allied Administrative Publication (AAP)-06, *NATO Glossary of Terms and Definitions*.

22 Airborne is defined as: adjective used to describe troops specially trained to carry out operations, either by paratroop or air landing, following an air movement. AAP-06.



3.4. Airborne forces are primarily transported by fixed-wing transport aircraft.

- a. **Airdrop<sup>23</sup> delivery** involves the air movement of personnel and/or cargo by aircraft into an objective area and their subsequent delivery by parachute.<sup>24</sup>
- b. **Air land delivery** involves the air movement of personnel and/or cargo which are landed on or near their objective by a fixed-wing aircraft.

Airdrop delivery reduces aircraft exposure to threats at the objective because they remain in flight. This has to be risk balanced with the cost of a relative dispersal of the ground force and cargo, and an increased risk of injury. Air land delivery offers greater unit integrity and usually maximises the use of aircraft cargo capacity. However, air landing requires a suitable airfield or air strip, and exposes the aircraft to threats at the objective.

3

3.5. **Air assault operations.** An air assault operation is defined as: **an operation in which air assault forces, using the firepower, mobility, and total integration of helicopter assets, manoeuvre on the battlefield under the control of the commander to engage and destroy adversary forces or to seize and hold key terrain.**<sup>25</sup>

3.6. **Airmobile operations.** An airmobile operation is defined as: **an operation in which combat forces and equipment manoeuvre about the battlefield by aircraft to engage in ground combat.**<sup>26</sup> Examples include:

- moving engineers to clear a defile ahead of an advancing ground force; or
- moving a ground force to establish a hasty defensive position to block an enemy advance.

.....  
23 NATO differentiates between airdrop and paradrop. Airdrop is defined as: **delivery of personnel or cargo from aircraft in flight.** Paradrop is defined as: **delivery by parachute of personnel or cargo from an aircraft in flight.** AAP-06.

24 The airdrop of cargo may or may not use parachutes.

25 NATO Agreed.

26 *Op. Cit.*, AAP-06.

The difference between air assault and airmobile operations is that the latter does not deliver a ground force expecting to fight for an objective immediately upon landing.<sup>27</sup> The advantage, therefore, is that airmobile operations require lower levels of training for the ground force and staff.

### Operation TELIC 1

In the initial war-fighting stage of Operation TELIC 1, Royal Navy and Army Air Corps helicopters provided reconnaissance and attack support to UK ground forces as an independent helicopter task. On 24 March 2003, 847 Naval Air Squadron was supporting 40 Commando, Royal Marines and elements of the 1st Queen's Dragoon Guards (1 QDG). At 0730, a large enemy position was encountered south of Basra and the aircraft were engaged by enemy artillery. They returned fire with missiles, destroying a D-30 howitzer. The number of aircraft on patrol was then increased to provide additional support to 1 QDG. After further engagements, due to the concentration of targets, United States fixed-wing aircraft were requested to enable UK helicopters to disengage. Just after 0900, two AV-8B and two A-10 aircraft engaged, with command and control provided by a forward air controller in a UK Gazelle helicopter. Several targets were hit and destroyed.

Historical Branch (Army)

3

**3.7. Independent helicopter tasks.** Independent helicopter tasks are those which can be carried out by helicopters independently of other arms, though they may be part of a broader ground scheme of manoeuvre. They are primarily focussed on offensive actions. These are most likely to be shaping tasks but may be mission-decisive tasks in their own right.

//  
**Independent helicopter tasks are primarily  
focussed on offensive actions.**  
//

.....  
<sup>27</sup> Note that the NATO definition for an airmobile operation includes reference to 'engaging in ground combat'. This can potentially cause confusion with air assault operation if interpreted as engaging immediately.



Soldiers deploy from a Chinook helicopter

3

3.8. Fixed-wing and helicopter-associated operations. Table 3.1 compares the advantages and disadvantages of fixed-wing and helicopter-associated operations.

	Comparative advantages	Comparative disadvantages
Fixed-wing operations	Inter-theatre reach	Likely to require international airspace clearance
	Speed	Ground force requires specific training
	Lift capacity	Aircraft failure or loss can result in losing a large portion of ground force
	Massed delivery	Resupply/evacuation is difficult
Helicopter operations	Battlefield reach	More vulnerable during air movement phase
	Tactical persistence	Limited lift capacity
	Versatility	Communication difficulties during air movement phase (line of sight issues)
	Access – smaller landing sites	Limited range and performance

Table 3.1 – Fixed-wing *versus* helicopter operations

## Section 2 – Air manoeuvre in the operational framework

3.9. Air manoeuvre can be applied across the operational framework which covers understanding, shaping, decisive action, sustaining and protecting phases of a concept of operations. Military activities are those that take place as part of operations, with the primary purpose of combat.

3.10. **Understanding.** Understanding can be achieved by collecting and analysing information gained by intelligence, surveillance and reconnaissance (ISR) activity and is a prerequisite for information and decision superiority. It supports effective decision-making. Air manoeuvre can contribute to understanding in several ways.

- a. Direct collection of information by aerial surveillance using helicopters.
- b. Covert delivery of ground reconnaissance forces by parachute or helicopter. Heavier recce forces can be inserted by air landing if required, with varying degrees of combat readiness.
- c. Providing an airborne command and control platform.

3.11. **Shaping.** Shaping actions set or preserve the conditions for mission-decisive actions. Effective shaping increases tempo and should be planned and executed along with understanding activities. Air manoeuvre contributes to shaping actions in various ways.

- a. **Deterrence.** The rapid delivery of a combined arms force by air manoeuvre into a deteriorating situation could demonstrate resolve and deter further aggression. Such an effect could also be created through inference or demonstration on exercise.

- b. **Vertical envelopment.**<sup>28</sup> Passing over the enemy's main defences to secure a key objective (for example, a logistic or command node) to keep them off-balance.
- c. **Precision strike or raid.** Destroying a high-value target with a precision strike or raid conducted by armed helicopters or ground forces delivered by helicopter.
- d. **Seizing.** Air manoeuvre can be used to seize key terrain, enabling ground forces to maintain momentum.
- e. **Deception.** Air manoeuvre can be used to influence behaviour or mislead a target audience, using both its overt presence and its ability to surprise.
- f. **Surprise.** Air manoeuvre can be used to appear from an unexpected place or direction at an unexpected time to surprise and fix an adversary. This may tie down reserves, dislocate a headquarters or disrupt logistic supplies.

3



Royal Marines with 40 Commando Group run through a smokescreen

.....  
 28 Envelopment is an offensive manoeuvre in which the main attacking force passes around or over the adversary's principal defensive position to secure objectives to their rear. Air manoeuvre forces may be employed as part of an enveloping force; this is also known as a vertical envelopment. Army Doctrine Publication (ADP), *Operations*, 2010, paragraph 0836.

### Operation AGRICOLA

The spearhead of the British deployment into Kosovo was a helicopter-borne force composed of elements of 5th Airborne Brigade, inserting approximately 1,400 personnel from two infantry battalions, and supporting artillery, logistic troops and engineers. Their main task in the initial phase was to secure a terrain feature designated the 'Kacanik defile' and the road leading from Pristina to Skopje, designated Route HAWK, to prepare the way for follow-on forces. Central to this task was facilitating forward passage of lines for the British 4th Armoured Brigade, as well as brigades from Italy, Germany and France. Subsequent phases continued this process for a United States brigade and other residual elements.

3

The insertion of 1,400 troops from 5th Airborne Brigade was carried out in several waves in less than three hours by eight Chinook and six Puma helicopters flown by the RAF, with US Army Apache helicopters in support. Prior to the operation, a Phoenix unmanned aerial vehicle had flown over the area of the defile for three days. Both helicopter and electronic warfare assets had air defence as their priority tasks, and air defence was a second priority for artillery assets after close support.

The operation commenced at 0500 on 12 June 1999, with the 1st Battalion The Parachute Regiment elements being lifted to the far end of the Kacanik defile from just south of the border between the former Yugoslav Republic of Macedonia and Kosovo, a distance of approximately 15-20km. The brigade group successfully conducted passage of lines with 4th Armoured Brigade. On 13 June, 5th Airborne Brigade came under operational command of 4th Armoured Brigade and was engaged in peacekeeping operations in and around Pristina.

Historical Branch (Army)

3.12. **Decisive action.** Decisive action seeks to achieve mission-decisive tasks through either engagement or exploitation. Air manoeuvre offers opportunities that could give an advantage in situations where our ability

to manoeuvre is reduced or our ability to achieve surprise is limited. These could include:

- using armed helicopters to destroy the enemy's armoured reserve;
- capturing key adversary leaders;
- seizing vital ground; and
- delivering humanitarian aid to the civilian population.

3.13. **Protecting.** Air manoeuvre activities can also fulfil force protection tasks. These could include:

- using helicopters to screen or guard a ground manoeuvre force, including counter-reconnaissance operations;
- enabling the movement and infiltration of light forces; and/or
- suppressing enemy combatants.

3.14. **Sustaining.** Sustaining tasks enable land forces to survive, move and fight. Joint enabling capabilities such as permanent joint operating bases and joint logistics are, and will remain, fundamental to delivering and sustaining power projection.<sup>29</sup> Air manoeuvre provides air-enabled movement of casualties, encompassing casualty evacuation and medical evacuation.<sup>30</sup> It can also enable intra-theatre airlift<sup>31</sup> by conducting security tasks along lines of communication thereby allowing:

- tactical resupply of air manoeuvre forces or ground manoeuvre forces outside of static locations; and/or
- prepositioning of equipment or resources to support an air or ground manoeuvre force (this could also apply to engineer stores or air portable artillery and ammunition).

.....  
29 Development, Concepts and Doctrine Centre, *Future Joint Operating Concept-Primer*, page 19.

30 See Allied Joint Publication (AJP)-4.10, *Allied Joint Doctrine for Medical Support* for details of casualty evacuation and medical evacuation. Strategic aeromedical evacuation also falls under personnel recovery but would not be considered under air manoeuvre.

31 See Joint Doctrine Publication (JDP) 0-30, *UK Air and Space Doctrine*, page 3-19. Intra-theatre airlift is a component of air logistic support dealing with the provision of logistics between bases within theatre using tactical air transport.

### Operation SILVER BAYONET, Vietnam

The 1st Battalion, 7th Cavalry was tasked to conduct an air assault at the base of the Chu Pong massif, south of the Ia Drang Valley on 14 November 1965. To support this, a battery of 105mm guns were moved into a landing zone by Chinook helicopters, 15km east of the objective. These guns fired on the objective immediately prior to the air assault, and continued to provide fire support throughout the operation.

Historical Branch (Army)



A Merlin helicopter carries a 105mm light gun



### Key points

- Air manoeuvre allows forces to rapidly deploy into theatre directly from the UK.
- Air manoeuvre operations apply to both the land and littoral environments.
- Airborne forces are primarily transported by fixed-wing transport aircraft.
- Airdrop delivery involves the air movement of personnel and/or cargo by aircraft into an objective area and their subsequent delivery by parachute.
- Air land delivery involves the air movement of personnel and/or cargo which are then landed on or near their objective by a fixed-wing aircraft.
- Air manoeuvre offers opportunities that could give an advantage in situations where our ability to manoeuvre is reduced or our ability to achieve surprise is limited.



## Operational considerations for air manoeuvre

Chapter 4 details the considerations required for air manoeuvre operations, ranging from command through to sustaining activities.

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Section 7 – Sustain . . . . .	.50

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Strategic air assault is **wasted** if it is dissipated piecemeal in **sporadic attacks** between which the enemy has an opportunity to **readjust** defenses or **recuperate**.

//

General Henry H. 'Hap' Arnold, USAAF

# Chapter 4 – Operational considerations for air manoeuvre

## Section 1 – Command

- 4.1. Commanding air manoeuvre operations effectively requires a joint perspective. This is best achieved with a joint headquarters, with suitably qualified and experienced single-Service staff embedded at all levels. Correctly configured, equipped, manned and trained, joint command and control organisations will be fundamental to success.
- 4.2. Joint air assets are highly sought after, but as they are generally limited in numbers there is potential to fragment the joint air effort as components compete for them. Consequently, control of air assets is often centralised at a higher level than that of land or maritime forces ensuring competing demands are prioritised and apportioned accordingly. The execution of joint air operations is usually delegated to the lowest practical level of understanding, which may be the cockpit or the environmental headquarters.<sup>32</sup> It is, therefore, useful to understand the links and relationships between the air, land and maritime components through the chain of command.
- 4.3. The Joint Force Air Component Commander will establish a Joint Force Air Component Headquarters with a number of key divisions and an embedded Air Operations Centre.<sup>33</sup> The Air Operations Centre is the principal centre from which air and space operations are directed, monitored, controlled, executed and coordinated with the other components. It produces the air tasking order, airspace control order, air defence plan and special instructions.
- 4.4. The Air Operations Coordination Centre (Land) provides air expertise, allocates support tasks to its associated tactical air control parties, and .....

<sup>32</sup> Joint Doctrine Publication (JDP) 0-30, *UK Air and Space Doctrine*, paragraph 349.

<sup>33</sup> Further detail on the Joint Force Air Component Headquarters is in Air Publication 3002, *Air and Space Warfare*. Divisions are: strategy; combat plans; combat operations; intelligence, surveillance and reconnaissance (ISR); and combat support.

integrates the liaison and coordination functions relating to joint air and space operations.<sup>34</sup> It reports to the Air Operations Centre and will normally co-locate with the highest tactical level.

4.5. The Air Support Operations Centre is the senior fielded air component. It provides the full range of air command and control functions at the tactical level, and is the UK's principal air command and control agency for controlling joint air operations supporting ground forces. It coordinates close air support and processes immediate requests for air support to ground manoeuvre forces.

4.6. Lower tactical units will also have an air liaison element attached to them and are formed around the tactical air control parties. Tactical air control parties will: advise the ground force commander on capabilities and limitations; coordinate airspace control measures; de-conflict joint air assets with other fire support; and provide the primary terminal attack control of close air support. This last role is carried out by a joint terminal attack controller.

4.7. In addition to the tactical air control parties, air staff officers are permanently established at the lower tactical level.<sup>35</sup> They assist with planning and coordinating battlespace management. Under some circumstances, the brigade air staff officers may be further augmented by the Air Support Operations Centre.<sup>36</sup>

4.8. The Joint Helicopter Command (JHC) Air Manoeuvre Planning, Training and Advisory Team provides helicopter advice and staff support to the higher tactical level and to the SO2 Aviation. The Joint Helicopter Force Headquarters staff supports the brigade, and will provide a liaison officer to them. If the lower tactical level does not already have an established SO2 Aviation, they may also receive one to provide helicopter expertise. Battlegroups do not normally have helicopter liaison; however, the package

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34 These include: close air support; air interdiction; suppression of enemy air defence; air mobility; ISR; and personnel recovery.

35 Adaptive force and reactive force brigades have differing requirements and manning levels. This example assumes a brigade during pre-deployment training and deployment.

36 Air Publication 3002, *Air and Space Warfare*.

commander/air mission commander, and possibly planning team<sup>37</sup> support from the joint helicopter force, will assist the battlegroup staff during the planning phase of an air manoeuvre operation. 16 Air Assault Brigade are uniquely staffed for their role, with a wider range of established air posts.<sup>38</sup>

4.9. Effective liaison between the executing component and air component is a key factor in the success of air manoeuvre operations. At the highest level, liaison elements from each component are embedded with the other. Figure 4.1 outlines the liaison relationship, giving the most extreme example of a corps deployment in a coalition. Maritime command is detailed in Chapter 6.

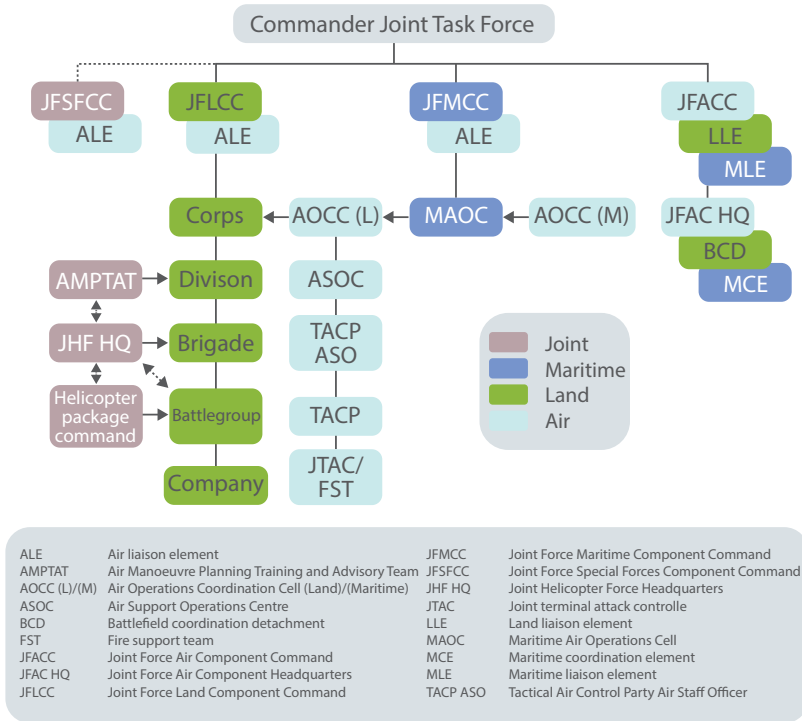


Figure 4.1 – Command and linkages

37 A planning team may consist of an aircraft operator and a mobile air operations team, with communications.

38 3 Commando Brigade are also uniquely staffed to support air activities within littoral manoeuvre.

4.10. In NATO, a division or a corps could fulfil the Land Component Command headquarters, with assigned helicopters grouped and organised under a brigade, division or corps depending on the mission or nature of the operation. NATO force generation may resource helicopters from a variety of troop contributing nations, forming a composite force commanded by the lead nation. Air manoeuvre operations are conducted in a similar manner to the UK, by ensuring the Ground Tactical Commander has the required aircraft and planning and liaison staff.

4.11. In the UK, the Military Aviation Authority regulates the risk to life associated with operating aircraft under the aviation duty holder construct. Risk to life can be said to be reduced to a level that is 'as low as reasonably practicable' (ALARP) when the cost of further risk reduction (mitigation) is grossly disproportionate to the benefits of risk reduction. Determining whether a risk is ALARP will include the assessment of good practice, a quantitative assessment and a qualitative assessment. It is a balance of gain *versus* the cost (in time, effort and financial terms). Further detail on risk management and air safety can be found in Air Publication 3002, *Air and Space Warfare*.

## Section 2 – Inform

4.12. Air and land intelligence requirements are often focussed differently. It is critical to share information within the headquarters to develop an accurate intelligence picture for all aspects of an air manoeuvre operation. Intelligence staff of the individual Services<sup>39</sup> must interact with each other and maximise their ability to reach back to their single-Service intelligence fusion centres and joint intelligence (J2) assets in the operational headquarters. Joint helicopter force elements must also be provided with a communications link into their supported headquarters.

“  
It is critical to share information within the headquarters to develop an accurate intelligence picture for all aspects of an air manoeuvre operation.  
”

39 Air intelligence (A2), land intelligence (G2) and maritime intelligence (N2).



4.13. Helicopter force information requirements will extend beyond those required by the ground manoeuvre force. They will require:

- mission-planning system mapping and imagery;
- environmental and meteorological information (to inform operational, training and engineering requirements);
- connectivity (for example, voice and data links) to the Permanent Joint Headquarters (PJHQ) and Air Warfare Centre;
- specific legal direction on rules of engagement and targeting directives; and
- specific airspace management information.



The Watchkeeper – an unmanned air system

## Section 3 – Prepare

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4.14. Force generation for tactical air manoeuvre operations is normally conducted from within a deployed joint helicopter force and ground manoeuvre force. The overall joint helicopter force package is task-organised against the required task by JHC/Army Headquarters and where appropriate, with a coalition headquarters. On occasion, forces are generated for specific air manoeuvre tasks from the home base. This also applies for airborne and air land operations.

4.15. PJHQ will develop the operational statement of requirement for forces. Once endorsed by the MOD, a force generation order will direct the respective headquarters of Land Forces, Air Command and Navy Command to generate the most appropriate military capability. Most elements will be found from units at high and very-high readiness. PJHQ then ratifies and authorises the force elements to deploy.

4.16. The JHC holds the Vanguard Aviation Force elements at readiness, which consists of three joint helicopter force headquarters and a pool of helicopters held at readiness.<sup>40</sup> Their construct and aircraft allocation will vary based on the task. Once deployed, helicopter availability will depend on a number of factors including engineering support, spares provision and the operating environment. Aircraft will be at graduated readiness to accommodate this. The total number of available aircraft will likely be lower than the total number in theatre. As a planning guideline, the *Defence Rotary Wing Capability Study* suggests an availability figure of 66%; this figure will vary and the relevant joint helicopter force headquarters will provide advice accordingly.

4.17. There are similar constraints on availability of air assets, encompassing attack aircraft, strategic air transport, tactical air transport and joint intelligence, surveillance and reconnaissance platforms. Early engagement, particularly for training activities, is required to ensure all parties' priorities are met. Additionally, the Defence Support Chain Operations and

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40 Joint Helicopter Force 1 (JHF 1) is based on the Attack Helicopter Force; JHF 2, the Commando Helicopter Force; and JHF 3, RAF Support Helicopter Force.

Movements tasks all strategic air transport<sup>41</sup> to support Defence activities. As such, there may also be extra constraints on strategic air transport availability, particularly for training.

### Operation PALLISER

On 5 May 2000, the Cabinet Office agreed to deploy an operational liaison and reconnaissance team to Sierra Leone in response to the threat to the lives of British citizens and other entitled persons. Concurrently, the spearhead lead element, based on the 1st Battalion, The Parachute Regiment battlegroup, reduced its notice to move on 6 May, moving to the Joint Air Mounting Centre that evening, and flying to Dakar, Senegal on 7 May. C Company prepared and executed a tactical air landing operation onto Lungi airfield in Sierra Leone that day. D Company, 2nd Battalion, The Parachute Regiment were the last to deploy from Dakar, waiting until 8 May for a C-130 aircraft to become available. Supporting the operation were four Chinooks that had self-deployed over 6/7 to 8 May, allowing evacuation operations to begin that night.

Historical Branch (Army)

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## Section 4 – Project

4.18. Air manoeuvre forces can project directly into theatre to conduct operations. To do this, air manoeuvre forces will need to be trained and equipped to a level that alleviates the absence of reception, staging, onward movement and integration training. This must be completed either in the UK or at a forward mounting base, if used, depending on the timeline. Very-high readiness force elements must have reception, staging, onward movement and integration procedures worked into their deployment plans.

4.19. Inter-theatre and battlespace air manoeuvre occur from either a forward mounting base in the joint operations area, or from a forward

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41 Air Publication 3002, *Air and Space Warfare*.

operations base within the area of operations or area of responsibility. These force elements will have previously conducted theatre entry and the associated reception, staging, onward movement and integration (RSOI) training.<sup>42</sup>

4.20. Staging through a forward mounting base has the main advantage of extending the range and duration of an air manoeuvre operation. It also allows reception, staging, onward movement and integration to take place as well as building up resources and shortening the lines of communication. The force is, therefore, prepared, but not committed. This may provide a deterrence effect, though it potentially alerts the adversary to our intentions. We can also use such perceptions as part of a deception plan with suitable operations security.

4.21. UK military helicopters can be transported by air transport. However, planners need to consider rebuild times which vary significantly by helicopter type, along with the ability to project aircraft engineering capabilities and sustain them. They may also self-deploy, though this will have an impact on aircraft hours, maintenance and crew rest.

4.22. Helicopters may also be deployed by shipping them to the forward mounting base or sea port of disembarkation; this is slower and requires aircraft to be protected from the elements. However, it can deliver a large number of aircraft in a single journey.<sup>43</sup> Helicopters can launch from military shipping, depending on levels of training, proximity to the target and the ability to establish and sustain command and control, and lines of communication. Helicopters require specific equipment and their aircrews require collective training to operate from shipping on an enduring basis.

4.23. Establishing control of the air is essential to provide freedom of manoeuvre in the air over a given period of time and is a prerequisite for successful air manoeuvre operations. However, control of the air is a relative condition and depends upon available resources and the commander's risk

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42 Reception, staging, onward movement and integration (RSOI) may also be conducted on board ship if transiting to the joint operations area, or preparing to conduct littoral manoeuvre.

43 Aircraft should not all be carried on the same ship to prevent their loss in the event of it sinking. The Atlantic Conveyor was sunk in 1982 resulting in the loss of all Chinooks onboard, destined for the Falklands Task Force.

appetite. Control of the air may be difficult, even if the adversary only has ground-based weapons.

4.24. Air manoeuvre operations may need to overcome some form of air defence.<sup>44</sup> This is achieved by conducting counter-air operations, a subset of control of the air. Counter-air operations in support of air manoeuvre include all actions taken, by any component, to gain and maintain control of the air. It requires careful coordination of all elements of the joint and possibly multinational force. These operations may involve fixed- and rotary-wing aircraft, cruise missiles, unmanned aircraft/remotely piloted aircraft, special forces, air-land-sea electronic warfare, artillery and ground manoeuvre forces.

4.25. Defensive counter-air operations are responsive and seek to nullify or reduce the effectiveness of enemy air and missile threats after launch. Offensive counter-air operations are proactive and seek to dominate the enemy's airspace and prevent the launch of threats; they are preferred to defensive counter-air. Offensive counter-air operations include surface attack operations, air-to-air fighter sweep and escort missions, and suppression of enemy air defences. Land and maritime forces may be able to contribute to the latter.

4.26. A large air manoeuvre operation may require extensive resourcing to achieve control of the air. A composite air operation (COMAO) describes a force flow or force package<sup>45</sup> of a large number of aircraft with a variety of complementary roles to achieve a task. It may contain fixed- and rotary-wing aircraft. A composite air operation is tasked by the Air Operations Centre in-line with the priority of the land scheme of manoeuvre.

4.27. A successful composite air operation requires extensive coordination. The air and executing component planning teams should be aware of a potential disconnect between themselves due to differences in battle

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 44 Now incorporated under the term anti-access and area denial (A2AD), covering defence against entry operations in all environments (urban, air, littoral and so on). JDP 0-30, *UK Air and Space Doctrine*, page 3-4.

45 Force flow consists of missions to attack separate targets against a common objective, synchronised by time. A package targets one target or objective within a window of time: concentration of effect.

procedure, notably different planning timelines.<sup>46</sup> This is particularly significant when planning to integrate JHC rotary-wing aircraft with fixed-wing aircraft into a composite air operation as each aircraft type has different operational parameters.

### Operation MOSHTARAK

On 13 February 2010, the International Security and Assistance Force (ISAF), in cooperation with units of the Afghan National Security Forces (ANSF), initiated an operation intended to remove the Taliban from the town of Marjah and other remaining strongholds in central Helmand province.

The operation itself began with the launch of command and control Sea King aircraft, followed by conditions-setting US and UK attack helicopters to ensure the security of helicopter landing sites. Precision infrared flare drops by KC-130 and A-10 aircraft ensured helicopter landing sites were suitably lit, with imagery provided to the Bastion Joint Operations Centre by three unmanned aircraft/remotely piloted aircraft lines and four Tornado aircraft.

In total, 37 helicopters from three nations lifted troops into the area of operations. The operation commenced at 0400, and in the space of two hours 1,200 combined force troops were delivered into 16 helicopter landing sites across Nad-e-Ali and western Babaji, previously secured by ISAF and ANSF special operations forces. The insertion was carried out in 11 waves during darkness and was completed as planned by first light.

Waves were sequenced and separated by time and height, with each national element having its own allocated airspace. Additionally, a discrete corridor was established for the use of medical evacuation and supporting aircraft.

Historical Branch (Army)

46 Pamphlet 101, *Army Aviation Operations Manual* (which uses Air Publication 3002 as its source), Chapter 8, paragraph 808, provides detailed guidance for land aviation commanders participation in planning composite air operations. Timelines refer to a 'typical' 48-72 hour land planning cycle compared to a potentially much shorter air planning cycle. See Annex A for further details on planning cycles.

4.28. When projecting airborne forces, communications may be required back to the UK and/or the forward mounting base while in flight. Some aircraft may have beyond-line-of-sight capability, although this may not always be achievable. The Boeing E-3D Sentry aircraft, an airborne warning and control system (AWACS), can provide the command element during projection. The E-3D Sentry can communicate with the package aircraft and is capable of reaching back to its command, giving better communication reach during the air movement phase.

4.29. The air movement phase is planned primarily by the air staff within the land formation. However, joint parallel planning remains essential as this phase is derived from the landing and ground tactical plan; timings and sequencing will all be built from these two elements. As joint planning is often done concurrently, the ground force element of the air manoeuvre force must ensure that it arrives at a workable solution specifying the effect to be created with enough time to allow the air component to plan effectively. The ground force element should also attempt to minimise significant changes to the plan once it has been issued.

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A joint approach – Apache helicopters on deck

## Section 5 – Operate

4.30. Planners must be aware of the complexities inherent within air manoeuvre operations, particularly within a coalition environment. This can include:

- congested airspace;
- different airspace management procedures;
- complicated command chains; and
- disjointed air and land planning procedures.

An outline planning guide is contained in Annex A.

4

### **Operating in a complex battlespace – Operation HERRICK**

Number 1 Air Control Centre (1 ACC) is the UK's deployable airspace management command and control asset and it was deployed to Afghanistan from 2006-2010. 1 ACC established the RAF's Air Support Operations Centre whose remit is to provide dynamic procedural airspace control. The Marine Air Ground Task Force deployed into Helmand from late 2009 and established the Direct Air Support Centre (DASC), (call sign 'OVERLORD') and executed procedural control of the Helmand airspace. 1 ACC then supplemented the US Marine Corps (USMC) manning at both the DASC and the Tactical Air Operations Centre. The control of airspace in Regional Command (South-West) was therefore based on USMC procedural airspace management doctrine and UK forces had to adapt to integrate.

It is unlikely that UK aircraft will enjoy the same freedoms on future operations as they did on Operation HERRICK. Effective airspace management remains a risk for contingency if not redressed in future training activity.

Historical Branch (Army)



4.31. Battlespace management has become increasingly important as we look to operate in congested and potentially coalition environments with a rising number of unmanned aircraft being used. Battlespace encompasses the electromagnetic, information and time dimensions, in addition to air and space, land and maritime dimensions.

4.32. The range of battlespace management activities is broad. Joint battlespace management includes land, air and space, maritime and electromagnetic spectrum management. Maritime battlespace management is covered in Chapter 6; electromagnetic spectrum management is outside the scope of this publication.

4.33. Land battlespace management combines air and ground measures, and considers four aspects: manoeuvre; fire support coordination measures; air defence requirements; and airspace control. Land battlespace management controls are split into terrain management (restrictions on movement, boundaries and so on) and fire support coordination measures, (restrictions and freedoms in using joint fires). Airspace management is the integration and use of airspace by indirect surface-to-surface, air-to-surface, surface-to-air weapons and air platforms.<sup>47</sup>

4.34. All components will invariably require access to airspace. However, component airspace requirements may often conflict. Consequently, all airspace requirements are considered at the joint force level and an airspace control plan is constructed to provide the best compromise in-line with the joint force commander's operational priorities.

4.35. Airspace control is directed by the Airspace Control Authority (usually the Joint Force Air Component Command) with the goal of increasing combat effectiveness by promoting the safe, efficient and flexible use of airspace through the airspace control plan. It also helps prevent fratricide in airspace that may be used by all component and civilian air traffic.

4.36. The airspace control plan is implemented by issuing the airspace control order, which contains various control measures. This can be modified

.....  
47 Allied Tactical Publication (ATP)-3.3.5.1, *Joint Airspace Control Tactics, Techniques and Procedures* and JDP 3-70, *Battlespace Management*.

by airspace control means requests<sup>48</sup> which allow components access to the airspace that they require. These are promulgated by special instructions when approved by the Airspace Control Authority.

4.37. The land/maritime component may not control the airspace above it. Therefore, all activity in or through the air, must be coordinated between all battlespace users. A portion of airspace can be delegated to a formation; enabling faster decisions. During air manoeuvre operations the airspace control means used include the following.

- a. **The coordination level.** This is essentially a 'stay above' level for fixed-wing aircraft and 'stay below' for helicopters.
- b. **High density airspace control zone.** This zone allows the control of a number of aircraft, fires and ground manoeuvre forces. This is likely to be used within the area of operations.
- c. **Restricted operations zone.** This zone is smaller than a high density airspace control zone (HIDACZ), and allows temporary exclusive use of an area of airspace. This is likely to be used on an objective for air manoeuvre forces.

Additionally, air manoeuvre operations may use air corridors, air routes, transit corridors and slow aviation asset flight routes<sup>49</sup> to move aircraft.

## Section 6 – Protect

4.38. Air manoeuvre forces are light by design, creating vulnerabilities that must be considered. Organic firepower and mobility is relatively limited. The firepower of fixed-wing attack aircraft and attack helicopters can offset this to some degree. Due to distance limitations, air manoeuvre forces are reliant on aircraft to sustain them. Air manoeuvre forces are particularly vulnerable to poor weather conditions which will impact on casualty evacuation and the

48 Known as an ACMREQ. Airspace control means are methods used to control airspace – high density airspace control zone, restricted operations zone and so on. Allied Joint Publication (AJP)-3.3.5(B), *Allied Joint Doctrine for Airspace Control*, page 2-4.

49 *Ibid.*, slow aviation asset flight routes are described on page A-7.

logistics chain. An inability to reinforce or withdraw the air manoeuvre force may lead to isolation and mission failure.

4.39. Combat identification is critical. This applies to control of the air, air defence and interaction with aircraft and ground forces. Combat identification consists of three related elements:

- situational awareness;
- target identification; and
- tactics, techniques and procedures.<sup>50</sup>

4.40. Air identification can be achieved using positive or procedural means and effective battlespace coordination. Air defence can be coordinated with battlespace management measures supported by identification, friend or foe (IFF) systems.

4.41. Air manoeuvre aircraft are susceptible to many weapons systems but tactics and equipment can mitigate their effectiveness. Air platform protection measures, including defensive aids, jammers, exhaust suppression and expendable countermeasures, can defeat many modern weapons. Continual weapons development requires air platform protection systems to be continually upgraded. Commanders must consider the assessed threat in theatre balanced against the capabilities of defensive systems, taking advice from the deployed helicopter subject matter experts and/or the Air Warfare Centre.

// **Air manoeuvre aircraft are susceptible to many weapons systems but tactics and equipment can mitigate their effectiveness.** //

.....  
50 Joint Tactics, Techniques and Procedures (JTTP) 3-62, *Combat Identification*, paragraph 105. Target identification can be improved with recognition training.

## Section 7 – Sustain

4.42. Joint logistics<sup>51</sup> and lines of communication support air manoeuvre forces, particularly aircraft. This relies on capability coherence, commonality in equipment and supplies and appropriate preparation time. These factors are increasingly important due to the consistent paucity of strategic and tactical air transport and support helicopters. They should be planned for accordingly.

4.43. Aircraft and aircrew availability is a key consideration for the duration of an air manoeuvre operation. Due to their mechanical complexity and environmental sensitivity, aircraft require regular maintenance, which is resource intensive. This means the number of available aircraft will be less than the number deployed whilst maintenance is carried out. Aircrew must also be adequately rested to operate effectively.

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4.44. The joint helicopter force provides its own first-line combat service support including supply,<sup>52</sup> basic repair and maintenance. The heavy emphasis on fuel, ammunition and spares requires ground lines of communication. Hard standings are preferred with covered and well-lit engineering environments. These offer the best opportunity for timely maintenance. There is also a significant requirement for connectivity and bandwidth for engineering and mission planning information technology.

4.45. The capacity of second and third line sustainment is a major consideration when deploying air manoeuvre forces. Sustainment requirements beyond two days will be drawn from second and third line enablers, or a joint combat service support element such as the RAF Tactical Supply Wing. Access to these resources is most likely by ground lines of communication.

4.46. Projecting the air manoeuvre force requires priming equipment packs to be issued to those ground and helicopter forces involved. This will include ammunition, medical equipment and other spares and consumables. The

51 JDP 4-00, *Logistics for Joint Operations*.

52 Supplies are defined as: **all material and items used in the equipment, support and maintenance of military forces**. Allied Administrative Publication (AAP)-06, *NATO Glossary of Terms and Definitions*.

first line priming equipment packs is scaled at three days consumption. Second and third line packs<sup>53</sup> are deployed once forward logistic elements are in position to receive them. Joint helicopter forces also require deployed spares packs to be held at first line to enable maintenance. A land deployed spares pack is resourced for 15 days use; a maritime deployed spares pack for 28 days use.



Supplying the newly landed force with vital equipment

.....  
53 A first line priming equipment pack contains three days combat supplies and materiel; second line has three days of each; third line has six days combat supplies and 22 of materiel.

4.47. UK operational-level planning includes developing sustainability requirements using the '4D' framework.<sup>54</sup> The 4Ds are: distance; destination; demand; and duration.

4.48. When planning and conducting air manoeuvre operations, there are many factors to consider within the 4D framework.

- a. Distance considerations could include: transportation mode; endurance; and lines of communication – air, land and sea.
- b. Destination considerations could include: geography; altitude; weather; infrastructure; technical support; road networks; and civilian contractors.
- c. Demand considerations could include: size of forces; transport capacity; fuel (quality and quantity); spares; and personnel.
- d. Duration considerations could include: logistic support; rotation; replacements; and maintenance.

The above factors, which may overlap in the framework, represent an indicative example only and will be far more detailed in the operational environment. The 4D framework is vital for sustaining air manoeuvre operations.

.....  
54 JDP 4-00, *Logistics for Joint Operations*, (4th Edition), page 156.

## Key points

- Effective liaison between the land and air component is a key factor in the success of air manoeuvre operations.
- It is critical to share information within the headquarters to develop an accurate intelligence picture for all aspects of an air manoeuvre operation.
- Air manoeuvre forces can project directly into theatre to conduct operations.
- Staging through a forward mounting base has the main advantage of extending the range and duration of an air manoeuvre operation.
- A large air manoeuvre operation may require extensive resourcing to achieve control of the air.
- Planners must be aware of the complexities inherent within air manoeuvre operations, particularly within a coalition environment.
- Air manoeuvre forces are light by design, creating vulnerabilities that must be considered.



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MAX WEIGHT: 550

NO STEP



## Conducting air manoeuvre in the land environment

Chapter 5 outlines broad considerations for conducting air manoeuvre in the land environment.

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Section 2 – Shaping . . . . .	.59
Section 3 – Decisive action . . . . .	.60
Section 4 – Protecting . . . . .	.67
Section 5 – Sustaining . . . . .	.70

//

This operation is not being planned with any alternatives. This operation is **planned as a victory**, and that's the way it's going to be. We're going down there, and we're **throwing everything** we have into it, and we're going to make it a **success.**

//

General Dwight D. Eisenhower

# Chapter 5 – Conducting air manoeuvre in the land environment

5.1. An air manoeuvre force is capable of conducting the core functions (find, fix, strike and exploit) across the operational framework. It offers particular utility at the divisional level when conducting decisive and shaping operations distant from the main force. Air manoeuvre gives the commander the ability to conduct tactical activity at reach, free from the constraints of the terrain and over a wider area than that afforded to purely ground forces. It cannot be conducted without effective air land integration.<sup>55</sup>

5.2. An air manoeuvre force package may be significant in terms of manpower and aircraft. A key role for the higher commander is to plan for, and accommodate, enablers with long lead times ensuring the executing unit is resourced and informed appropriately. The following considerations will allow the higher commander to support the executing unit and to synchronise air manoeuvre as part of land manoeuvre.<sup>56</sup>

## Section 1 – Understanding

5.3. Intelligence gathering and developing situational awareness can be achieved with both piloted aircraft and unmanned/remotely piloted aircraft. Reconnaissance and, to an extent, attack helicopters, have intelligence, surveillance and reconnaissance (ISR) gathering capabilities. Helicopters, other piloted aircraft and unmanned/remotely piloted aircraft can be synchronised with ground manoeuvre forces to improve the intelligence picture. However, consideration must be given to transmitting and processing information in the absence of real-time air-to-ground links.

.....  
55 The higher land commander (Land Component Commander) could range from a corps to a brigade. The larger the higher commander, the more air manoeuvre resources it is able to control. The executing unit may be a brigade or battlegroup.

56 Guidance for planning and conducting air manoeuvre operations at brigade and battlegroup level can be found in Doctrine Note 15/02, *Airmobile Operations* and Doctrine Note 14/07, *Tactical Air Landing Operations*.

5.4. The executing unit will be unlikely to possess tactical unmanned aircraft or have sufficient lead time to conduct an ISR soak.<sup>57</sup> The higher command must bid for and employ ISR assets to develop a broad understanding of the objective area. Given that this may be in the deep battlespace, the commander may have to request assets outside of their own command.

5.5. In addition to the objective area, ISR may be required on landing sites and on segments of air movement corridors. There is potential for a large number of ISR assets to be tasked to an air manoeuvre operation. To that end, the burden of controlling and interpreting ISR may fall to the higher command as it may be beyond the capability of the brigade to do so.

5.6. The higher command must link in with air intelligence (A2), and should request a liaison officer to achieve this. Air intelligence will have access to the Air Operations Coordination Centre and by reachback to the Air Warfare Centre in the UK. This allows air intelligence to conduct immediate analysis of threats in the area. This will determine if UK aircraft are able to mitigate the threat with existing weapons or defensive aid suites, or whether the threat will significantly affect air operations. The higher command will therefore be able to determine the feasibility of the mission prior to starting detailed planning.

5.7. The Land Component Commander is responsible for liaising with the Air Operations Centre to ensure that the requirements for all land force elements (notably helicopters) are reflected in the air tasking order special instructions (SPINS). SPINS provides identification, friend or foe (IFF) codes and laser codes, as well as covering frequency management.

5.8. The higher command must ensure that all force elements are supported by sufficient information technology and bandwidth. The Joint Helicopter Force Headquarters will require links to air intelligence; helicopter operations rely heavily on information technology for mission planning and equipment support functions.

.....  
57 Intelligence, surveillance and reconnaissance soak describes the use of various complementary surveillance and reconnaissance systems to gather information about an area or objective for an extended timeframe.

5.9. A commander's critical information requirements should support the entire air manoeuvre operation and force collaboration. Considerations for the location and states of tactical landing zones, drop zones and helicopter landing sites must be made early, along with options for forward arming and refuelling points and identifying air defence assets to advise the operational risk management process.

## Section 2 – Shaping

5.10. The air support operations cell is likely to be embedded within a division. They will work with the Air Manoeuvre Planning Team to synchronise the air tasking cycle. Divisional planners must accommodate the 48-hour cycle required to produce the air tasking order. This is best achieved by articulating clear requirements and engaging with the air support operations cell in sufficient time. However, divisional planners must also be flexible enough to accommodate shorter notice tasks using aircraft available at higher readiness states.<sup>58</sup>

5.11. Deception for air assault operations can be achieved using helicopters and troops; an airmobile operation taking place on a flank could mislead the enemy as to the true objective. However, this goes against the principle of delivering sufficient mass within the first wave of an air assault, which may result in loss of surprise. Deception may be better achieved with the use of ground manoeuvre forces within a scheme of manoeuvre.

5.12. The higher command must interpret the theatre targeting directive and rules of engagement to accommodate nuances with helicopter weaponry. For example, Apache can generate a firing solution using just the radar, and fire on it. The directive may allow this, or demand that it visually confirms the target. Deconfliction measures (separation by height, time or space) will be required for effectively integrating helicopters into a composite air operation.

.....  
58 Joint Helicopter Force (JHF) Headquarters or Joint Aviation Group (JAG) may hold aircraft at readiness to accommodate short notice tasks. The air tasking order will have aircraft configured for close air support that can react to short notice tasking using the joint tactical air request process.

5.13. Planning for the use of a forward arming and refuelling point may require a lead time beyond the planning cycle of the brigade. Forward arming and refuelling points operate in a matrix – opening, closing and moving – with two to three operating for an attack helicopter regiment. They will require accommodation with battlespace management to move and also to accommodate other aircraft. This is particularly relevant if the ground forces are manoeuvring.

5.14. Advance forces will require robust communications, an extraction plan and access to offensive support. This may require divisional support, especially if they are deployed at significant ranges: for example, Pathfinders. Frequent training is essential to retain familiarity and competence with air manoeuvre. This applies equally to ground forces and aircrew. Single-Service and joint training is essential for developing a competent air manoeuvre force.

“ Single-Service and joint training is essential for developing a competent air manoeuvre force. ”

5

## Section 3 – Decisive action

5.15. Specialist forces such as 16 Air Assault Brigade and 3 Commando Brigade are more suited to the wider range of air manoeuvre tasks. The former is optimised for airborne and air assault. However, all light forces are capable of airmobile operations with a small amount of training. As a minimum, this will require unit familiarisation training coordinated by the Joint Helicopter Force Headquarters, including staged trooping drills. A basic level of air manoeuvre training should be conducted during the training year for all light forces. Table 5.1 summarises the use within the spectrum of air manoeuvre of specialist forces against general light forces.

Specialist air manoeuvre forces	Generalist light forces
Routine use of helicopters	Familiar with emplaning/deplaning techniques
Familiar with specialist insertion/landing techniques	Can operate from a helicopter landing site or tactical airstrip
Expert in integrating air and land fires	Require air planning team to support battlespace management/fires planning
Conducted by specialist light forces	May also be mechanised or armoured forces operating out of role
Headquarters manned and trained to conduct air manoeuvre operations	Headquarters manned and trained to conduct airmobile operations

Table 5.1 – Specialist air manoeuvre forces and generalist light forces

5.16. Tactical command of air manoeuvre operations will normally sit with the ground tactical commander who commands the ground elements of the air manoeuvre force. However, abort authority may be delegated to the package commander during the air movement phase. For helicopter-only tasks, the package commander retains command throughout. If a composite air operation is used, the package leader, who may be fixed-wing or helicopter package commander, will fulfil a similar role.

5.17. Air manoeuvre operations (less helicopter-only tasks) consist of five phases. These phases are planned in reverse to fully sequence and synchronise the constituent parts; the phases are listed below.

- a. The **staging phase** involves moving troops and equipment to the Joint Air Mounting Centre, a forward mounting base or helicopter landing site. It can also mean moving troops and equipment on to a ship, like the landing platform helicopter (LPH).
- b. The **loading phase** covers the embarkation of troops and equipment onto the aircraft.

- c. The **air movement phase** begins when an aircraft leaves the Joint Air Mounting Centre, forward mounting base or helicopter landing site and ends when troops and equipment are delivered to the landing site.
- d. The **landing phase** begins with troops and equipment exiting the aircraft and includes rallying procedures to form tactical groupings.
- e. The **ground tactical phase** covers achieving initial objectives and extends until the mission is completed and the air manoeuvre force is relieved or reinforced.

5.18. Once the mission is complete, a final consideration should be whether to extract the air manoeuvre force or to integrate it with the ground manoeuvre force. Integration gives continuity and improves combat power. Extraction preserves the force and retains flexibility for the joint force commander.

## Staging phase

5

5.19. Staging essentially involves the mass movement, sustainment and protection of air manoeuvre forces to the point of embarking aircraft. For airmobile and most air assault operations, this is within the capabilities of the executing brigade. Airborne and larger air assault operations launching from a forward mounting base overseas may require additional resources such as:

- ammunition transport and storage;
- proximity to appropriately sized landing sites for all aircraft to be used, plus associated fuel and equipment support elements;
- space for accommodation, feeding, rehearsals, briefings, rigging of loads; and
- personnel and equipment transport.



## Loading phase

5.20. Site selection is linked to the staging phase. Sequencing aircraft loading is viable; however, this will then require aircraft and embarked troops to take off and circle whilst waiting for the others.

## Air movement phase

5.21. Aircraft and ground forces should be able to communicate directly but complications caused by range and terrain masking requires a robust command and control plan. The higher command can support this by requesting command and control aircraft; providing additional radio rebroadcast capabilities and more liaison officers. However, the higher command must be aware that command and control aircraft are unlikely to be available beyond initial insertion of air manoeuvre forces, so the communications plan must be able to endure using other methods (for example, high frequency, tactical satellite or radio rebroadcast).

5.22. During inter-theatre operations, communications for the ground tactical commander and assault troops is difficult and, therefore, mostly done via the aircrew. These communications can be between aircraft, to the Boeing E-3D Sentry aircraft or to the UK and may be restricted by emissions controls in place for the operation.

5.23. Each chalk commander and the embarked ground tactical commander should have communications with their aircrew. Communications between



Paratroopers line up to board a Royal Air Force Hercules

troops in different helicopters may be achievable if the aircraft have radio capacity to set up an 'assault frequency' net for the embarked commanders to use.

## Landing phase

5.24. Landing sites include drop zones (parachute and aerial resupply); tactical landing zones (air landing) and helicopter landing sites.<sup>59</sup> Landing site sizing and geographic considerations should be sought from suitably qualified personnel.<sup>60</sup> Aside from facilitating the safe ingress and egress of aircraft and the proximity to the objective, there are several general considerations for selecting landing sites.

- a. The threat level and the weather, including wind, dust and light levels, for example.
- b. Landing sites should be flat or rolling, with the minimum of obstacles – no obstacles for a tactical landing zone. Obstacles on a drop zone will not prevent landing but could increase jump casualties.
- c. Constructing and maintaining landing sites should demand the minimum amount of engineering support, reducing the burden on aircraft and resources.
- d. The altitude of potential landing sites may not be supportable due to operating restrictions of certain aircraft, in particular helicopters. Temperature and humidity will also be a constraint as they affect air density and, therefore, the ability to generate lift. High altitude and high temperatures have the worst effect.
- e. Landing sites will ideally use terrain that is easily defensible, offering cover and concealment nearby.

.....  
59 See the lexicon for definitions of landing site, landing point and landing zone.

60 For example: appropriate aircrew; mobile air operations teams; defence helicopter handling instructors; tactical air traffic controllers; and air despatchers. The operational situation will determine how long a landing site will take to recce and clear for use.

- f. If tactically viable, proximity to a road network can ease the movement of troops and equipment from the landing site. It also allows more rapid movement of a link-up force to it.

Of course, some of these considerations may also give advantage to an adversary. Landing site selection should balance our own benefit against the possible loss of surprise.



16th Air Assault Brigade jumping

5.25. A Defence Science and Technology Laboratory (Dstl) study<sup>61</sup> found that within the battlegroup scale of air manoeuvre operations, larger operations were more successful. Parachute and air assault operations should aim to deliver a battlegroup in a single wave to achieve surprise. The higher command will be required to allocate or bid for sufficient aircraft to permit mass.

5.26. Air manoeuvre works best if it is synchronised with other ground manoeuvre or ship to objective manoeuvre. However, air manoeuvre

.....  
61 Dstl conducted a historical analysis of air manoeuvre operations since the Second World War to support a series of air manoeuvre war games with 16 Air Assault Brigade held during March 2015.

objectives must be mutually supportable and within the span of command and achievable range of influence for the commander. There may be a temptation to over-reach with air manoeuvre forces, relying too heavily on the principle of surprise to maintain initial success.

### **Operation SABRE TOOTH, Borneo**

In March 1964, the 2nd Battalion, 10th Gurkha Rifles (2/10 GR) attempted to intercept a mixed force of Indonesian infantry which had crossed the border into Malaysian Borneo. The pursuit by C Company failed to locate the enemy, but intelligence was received which led them to expect another incursion. B Company was tasked with setting an ambush along the Indonesians' route, whilst C Company was ordered to block the enemy's retreat.

On 26 March, A Company of the Indonesian 'Black Cobras' Battalion crossed the border into Sarawak, heading straight into B Company, 2/10 GR's waiting ambush. To guarantee the enemy's successful interception, the commanding officer decided to reinforce the pursuing units with D Company, the assault pioneer and reconnaissance platoons and the recently attached independent Gurkha Parachute Company. This meant that 2/10 GR's battalion area was held only by A Company and an attached token force. These units were moved to establish a cordon to prevent the Indonesians' escape, and the rough terrain meant almost all movement was undertaken by helicopter. Helicopters were used to lift small units to tactical points, and, as the enemy retreated from the ambush sprung by B Company, they were used to conduct small-scale tactical lifts to bar potential escape routes. Throughout the three weeks of Operation SABRE TOOTH, helicopters flown by 825 Naval Air Squadron were used to lift 2,236 men and 152,050lbs of supplies in 164 flying hours.

Historical Branch (Army)

5.27. A composite air operation, in support of an air manoeuvre operation, will have aircraft assigned to counter-land operations, for example, close air support or strike. However, the air tasking order will also allow for additional close air support aircraft to support operations. These aircraft can be tasked using the joint tactical air request process and allows for dynamic targeting.

5.28. Planning must include the extraction or relief of air manoeuvre forces, and so synchronisation with wider ground manoeuvre is essential. This is particularly important for link-up operations, with clear rules of engagement and methods of combat identification. Extraction also requires sufficient mass of aircraft to move the air manoeuvre force – including advance forces in the minimum number of waves.

## Section 4 – Protecting

5.29. Threats can be mitigated through control of the air, defensive aids and tactics, techniques and procedures. These are all enabled with robust joint intelligence (J2) hinging on effective fusion of ground and air intelligence (G2 and A2).

5



Patrolling

5.30. Airfields require force protection.<sup>62</sup> This should be provided by ground forces<sup>63</sup> that will support establishing local control of the air by employing ground based air-defence, airspace control means and securing terrain around the airfield. Protection can also be provided by the maritime component if they are in range.

5.31. Local control of the air may be required to defend a tactical landing zone. This will be achieved organically by the brigade using all arms air defence and any attached short-range air defence assets. The division should accommodate this by providing the brigade with a high density airspace control zone.

5.32. Control of the air is a relative condition and may change. Sufficient control of the air will be a go/no-go criterion for launching air manoeuvre operations.<sup>64</sup> Assessing the required level of control of the air is a necessity for the whole operation, and not just the insertion and extraction. Although led by the air component, the land and maritime components can contribute to control of the air by suppressing enemy air defences using their associated weapon systems, for example, special forces, artillery or cruise missiles.

5

5.33. The identification method of ground forces must be established – using correct tactics, techniques and procedures – and an appropriate weapon control state set. Situational awareness and a clear understanding of both weapon effects and the rules of engagement reduce the risk of fratricide.

5.34. Military engineering support to air manoeuvre operations is most likely to be found from tactical ground close support engineering units. Using light equipment, these units are capable of clearing obstacles and creating defences; the latter being constrained by limits on manpower, resources and time.

.....  
62 Allied and UK force protection considerations can be found in Allied Joint Publication-3.14, *Allied Joint Doctrine for Force Protection*, 2015.

63 Protection may be provided by host nation forces.

64 These are elaborated on in Doctrine Note 15/02, *Airmobile Operations*.

5.35. Specialist units can undertake limited airfield and airstrip repair. General support units will be required for more sophisticated defences and for constructing or extensively repairing airfield or airstrip sites.

### Dhofar

In 1962, a rebellion broke out in Oman's Dhofar region. With British help, the Sultan's armed forces successfully defeated the rebellion by January 1976.

One vital part of the campaign in the early 1970's was the protection of the vital Salalah region. This required constructing a number of fortified defensive lines and outposts stretching some 30 miles from the coast to the inland. A number of strongholds were also built in the inland north. All this was created in rough roadless terrain and was made possible with both helicopter and fixed-wing airlift.

In 1974, the RAF sent a detachment of four 72 Squadron Wessex helicopters, primarily to assist with constructing the 'Hornbeam' defensive line. In six months they logged a total of 1,487 flying hours and carried 2,750 tons of freight and 15,000 personnel. They participated in six large artillery moves and six large offensive operations. The region was protected and the rebels never really penetrated and threatened Salalah.

Historical Branch (Air);  
Historical Branch (Army)

5.36. The higher command must interpret the theatre policy for joint personnel recovery. If the division forms the land component command, it is responsible for resourcing the joint personnel recovery plan. Planning considerations for joint personnel recovery can be found in NATO Allied Joint Publication (AJP)-3.7, *Allied Joint Doctrine for Recovery of Personnel in a Hostile Environment*.

5.37. The higher command is the main conduit for meteorological information. Timely and accurate weather forecasting is crucial to planning and sustaining air manoeuvre operations.

## Section 5 – Sustaining

5.38. Sustaining the air manoeuvre force is one of the major constraints on the amount of time the force can be deployed. Sustainment relies on helicopter internal or underslung loads, air land or airdrop. In turn, this depends on aircraft availability, weather and threat levels. Effective allocation of limited medical and technical manpower and resources is critical in air manoeuvre operations.

5.39. Deployed helicopters will operate from a helicopter forward operating base. The size of a helicopter forward operating base depends on the size of the force, logistic requirements, the threat and the environment, amongst other considerations. A very large helicopter forward operating base is likely to be accommodated within a larger main operating base; smaller footprints may be incorporated into a ground manoeuvre force forward operating base, or removed entirely if sea-basing is a viable option.

5.40. If the division and the joint helicopter force are advancing, helicopter sustainment will most likely need to be moved by vehicle. Planners must note that attack helicopter ammunition requirements are significant, and will require a substantial number of palletised load system vehicles.

5.41. Helicopter activity will be restricted until the support chain is established. This is still relevant for inter-theatre and, to an extent, tactical operations, and has notable relevance for ground manoeuvre brigades which have no organic combat service support capability to support helicopter activities. Accurate forecasting of helicopter activity, based on effective planning, will allow for proactive sustainment.





A Chinook helicopter

5.42. In the event of a theatre entry operation, fuel capacity will be severely limited. A joint helicopter force headquarters can temporarily deploy its own forward arming and refuelling point<sup>65</sup> to permit extended missions. Forward arming and refuelling point sizes vary; a small one could fit within a 100 metre perimeter clearing. An air land arming and refuelling point provides a similar service that is air portable. The capacity of the aviation fuel supply chain, and the quality of the fuel within it, is a critical factor in maintaining the tempo of air manoeuvre operations. Though delivery of aviation fuel during the initial period by air transport may be feasible, it would place significant demand on air transport resources. Fuel may therefore be supplied by contractors or the host nation but joint staff will need coherent planning and close control to ensure reliability and quality of supply.

.....  
65 Or forward refuelling point if no arming is required.

## Key points

- A commander's critical information requirements should support the entire air manoeuvre operation and force collaboration.
- An airmobile operation taking place on a flank could mislead the enemy as to the true objective.
- Specialist forces such as 16 Air Assault Brigade and 3 Commando Brigade are more suited to the wider range of air manoeuvre tasks.
- All light forces are capable of airmobile operations with a small amount of training.
- Landing sites include drop zones (parachute and aerial resupply); tactical landing zones (air landing) and helicopter landing sites.
- Landing site selection should balance our own benefit against the possible loss of surprise.
- Parachute and air assault operations should aim to deliver a battlegroup in a single wave to achieve surprise.
- Sustaining the air manoeuvre force is one of the major constraints on the amount of time the force can be deployed.
- The capacity of the aviation fuel supply chain, and the quality of the fuel within it, is a critical factor in maintaining the tempo of air manoeuvre operations.

Notes:



## Conducting air manoeuvre in the littoral

Chapter 6 outlines considerations for conducting air manoeuvre in the littoral environment.

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A **landing** on a foreign coast in the face of **hostile troops** has always been one of the most difficult operations of **war**.

//

6

Captain Sir Basil H. Liddell Hart

# Chapter 6 – Conducting air manoeuvre in the littoral

6.1. Air manoeuvre in the littoral is not a means within itself; air manoeuvre facilitates littoral manoeuvre.<sup>66</sup> Littoral manoeuvre aims to generate a military effect on land. This chapter does not describe how to conduct littoral manoeuvre. Rather, the chapter highlights the extra considerations, opportunities and constraints when conducting air manoeuvre in the littoral environment.

6.2. Littoral air manoeuvre is achieved using ship to objective manoeuvre. This uses mobility and firepower to launch directly against an objective from the sea. This is different to a traditional amphibious operation, where the beachhead is an essential tactical node; this remains the case for surface offload.

6.3. The littoral manoeuvre headmark<sup>67</sup> provides the contextual framework for air manoeuvre within the action phase of an amphibious operation. In outline, it states that the UK amphibious force should be able to conduct ship to objective manoeuvre over distances of up to 110 nautical miles. The initial assault wave can be delivered simultaneously by air and sea. The whole landing force can be sustained by air and surface means from a sea base located up to 30 nautical miles offshore.

6.4. Amphibious operations have two distinct phases. The initial phase is commanded, executed and supported from the sea. If the landing force is to be established ashore upon transfer of authority between the amphibious task force and the land force commanders, the second phase will see command and execution ashore, with support from the sea.

.....  
66 Littoral manoeuvre is the term used to describe the manoeuvrist approach to amphibious operations; concentrating on seizing the initiative and applying strength against weakness and vulnerability, while protecting the same on our own side. A full description of littoral manoeuvre can be found in Royal Navy Book of Reference (digital) (BRd) 4487, *Fighting Instructions*, Volume 2-2.

67 The description of the required amphibious capability derived by the Royal Navy from Government policy. Full description available in BRd 4487, *Amphibious Warfare*, page 3-1.

## Section 1 – Command

6.5. An amphibious task force delivers a landing force to the joint operations area, potentially followed by projecting the force ashore. The nature of littoral manoeuvre is complex and requires amphibious forces to be commanded using a unique co-equal relationship between 1\* land and maritime force commanders. They work together to create the required effect on land. At sea, the naval Commander Amphibious Task Force shapes the environment and delivers the landing force to a position of advantage. This function usually falls to Commander Amphibious Task Group, who commands all the specialist amphibious and support shipping within the task force. The Commander Landing Force owns the ground force element and is responsible for delivering tactical success on the ground. This is usually Commander 3 Commando Brigade. There may also be a 1\* Commander Carrier Strike Group, who commands an aircraft carrier, associated shipping and aircraft. All work to the Maritime Component Commander under the Joint Force Commander.

6

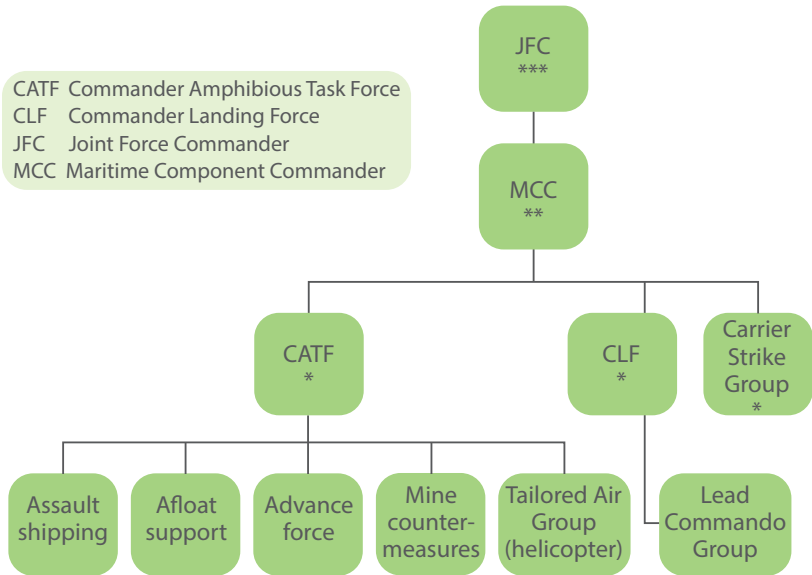


Figure 6.1 – Command structure



6.6. The helicopter command element is embedded with the land and maritime force commanders and will provide advice and guidance during the planning phase.<sup>68</sup> They are located on the primary command and control ship. This is usually the landing platform dock (LPD). During the execution phase they will provide command and control of air manoeuvre assets from the supporting arms coordination cell aboard the command ship.

6.7. The Joint Helicopter Force 2 Headquarters commands helicopters and supporting assets used for ship to objective manoeuvre. This headquarters is drawn from the Commando Helicopter Force. Helicopters can be drawn from throughout Joint Helicopter Command to form the Joint Helicopter Force 2 Tailored Air Group.<sup>69</sup> Additional maritime helicopters remain under Royal Navy command and are used for maritime force protection.<sup>70</sup> These aircraft will be referred to as maritime helicopters in this publication. These maritime helicopters may support air manoeuvre tasks if maritime force protection threat levels permit.

6.8. The Joint Expeditionary Force (Maritime)<sup>71</sup> comprises a scalable and modular task force, the composition of which will vary in accordance with the mission and availability. It includes the UK Amphibious Task Force.

## Section 2 – Inform

6.9. Intelligence is fused within the task force by the maritime and land intelligence staff (N2 and G2) embarked in the command ship. The Joint Helicopter Force 2 Headquarters will provide joint intelligence with a staff that is split between the command ship and the designated landing platform

68 As the Joint Helicopter Force 2 Headquarters will be drawn from the Commando Helicopter Force, who are the subject matter experts for air manoeuvre in the littoral environment, it is unlikely an air manoeuvre planning team will deploy with the Commander Amphibious Task Force/Commander Landing Force staff.

69 Merlin 3/4 and Wildcat battlefield reconnaissance helicopter from the Commando Helicopter Force are earmarked, as well as elements of the Apache and Chinook forces.

70 Force protection provided by airborne surveillance and control, anti-surface warfare and anti-submarine warfare.

71 The Joint Expeditionary Force (Maritime) replaces the Responsive Force Task Group as the maritime commitment to the Joint Expeditionary Force.

helicopter (LPH) ship.<sup>72</sup> This ensures effective flow of information to the aircrew while supporting the helicopter command element and liaising with maritime and land intelligence staff.

6.10. Airborne intelligence, surveillance and reconnaissance (ISR) assets, particularly unmanned and remotely piloted aircraft, may be limited to those contained within the task force. This means that there will likely be fewer ISR assets than those available during land operations. Intelligence soaks of objective areas prior to an operation may be limited to ground reconnaissance forces; together with experts from 30 Commando Information Exploitation Group Royal Marines and, potentially, UK Special Forces. This will include Royal Navy mobile air operations teams.<sup>73</sup> Inserting these forces before landing may be a task for helicopters, possibly detached ahead of the main amphibious task force on a frigate or destroyer.

6.11. Using a voice radio network is currently the only way to promulgate situation updates to helicopter aircrews during a mission. This may require commanders to dedicate one of the embarked helicopters to voice reporting and communications relay.

6.12. Air mission planning demands a lot of digital information. Bandwidth and physical space for communications equipment is extremely limited onboard ships, so information flow must be efficient. This requires using common types of equipment and message formats between all aircraft types and ships in the task force.

## Section 3 – Prepare

6.13. Force generation for littoral operations may be conducted from the UK or from a deployed task force. Helicopters may self-deploy or use strategic air transport to meet up with a deployed task group. However, embarking support equipment and personnel may require the task group to go alongside in a permissive environment, affecting the planning timeline.

.....  
72 The landing platform helicopter (LPH) is the primary helicopter platform. While the UK currently operates HMS Ocean as the sole LPH, the Queen Elizabeth Class aircraft carriers will have a scalable configuration, and may operate in a dedicated LPH role.

73 Royal Navy Mobile Air Operations Teams are part of the Commando Helicopter Force and are trained as reconnaissance operators.

6.14. Troops, equipment and aircraft assigned to air manoeuvre may not necessarily be co-located within the task force, due to a rapid, unplanned embarkation or due to availability of space, particularly for vehicles. Helicopter support personnel will usually be prioritised over landing force troops in the landing platform helicopter ship.

### Falkland Islands

The Falklands Task Force was dispatched very quickly, long before any landing planning had been conducted. Consequently the cross-loading of troops and their equipment along with the re-loading of most ships was done at Ascension Island, the forward mounting base for the operation.

*Doctrine Note 15/09, Joint Theatre Entry*

6.15. The planning assumption for assault operations is that a company group can be lifted in a single wave. Numbers will be based on an assumed aircraft availability of 95% for a pre-planned assault, reducing to 75% for 14 days high intensity operations and 66% for sustained operations. Attack helicopter availability is assumed as 66% when planning for all operations. These numbers are higher than for the land environment due to the necessity to make the maximum use of limited embarked aircraft, allied to the well-founded maintenance organisation and equipment onboard.

6.16. While assigned forces are held at high readiness, force integration training will be conducted during the transit to the joint operations area. Such training begins with troop/aircraft familiarisation and culminates in a wet and dry mission rehearsal. A rehearsal is also required to validate the plan.

## Section 4 – Project

6.17. It is preferable for helicopters to operate for sustained periods from ships equipped with hangars as they provide environmental protection and are easier for maintenance. However, deploying a large number of aircraft may result in helicopters being dispersed around the task group. The following are the primary ships used to launch air manoeuvre helicopters.



A landing platform helicopter



A landing platform dock



A landing ship dock (auxiliary)

a. **Landing platform helicopter.** The LPH provides the deck and hangar space required to enable air manoeuvre.<sup>74</sup> It is the principal helicopter platform with the associated command and control and support functions. The LPH also enables the surface assault by operating four Landing Craft Vehicle Personnel (LCVP). The Queen Elizabeth Class carrier, which is being re-roled to function as an LPH, will not have a surface manoeuvre capability.

b. **Landing platform dock.** The LPD is unique in that it supports all the key amphibious functions. Critically, it provides the command, control and communications necessary for a battle staff with maritime, land and air elements. It can accommodate a landing force and conduct limited helicopter operations from its flight deck; however, it has no hangar. The LPD has a dock and davits, carrying four landing craft utility and four LCVPs.

c. **Landing ship dock (auxiliary) (LSD(A)).** The LSD(A) provides the major part of the landing force, vehicle and freight capacity. Each platform can also carry a landing craft utility in its dock. An LSD(A) also has one spot from which to operate helicopters, but no hangar.

.....  
<sup>74</sup> HMS Ocean can embark, support and operate a tailored air group of 16 medium support helicopters plus six light helicopters. Chinooks can be embarked on the flight deck only (lack of powered blade fold prevents routine hangar use).



Queen Elizabeth Class carrier

6.18. Aircraft which are not cleared or equipped to operate from ships, such as the Puma, may still be transported by sea with minimal preparation.<sup>75</sup> On arrival in the operating area, they will be expected to disembark and base ashore.

6.19. Air manoeuvre helicopters will be involved in shaping operations, particularly in the absence of fixed-wing aircraft. The Wildcat maritime attack helicopter may perform intelligence, surveillance and reconnaissance tasks, and attack helicopters can provide pre-landing fires and support the insertion of pre-landing forces.

6.20. The range at which helicopters will be launched to an objective will depend on a variety of factors including adversary anti-access and area denial (A2AD) capabilities.<sup>76</sup> Positioning must balance the need to create effect ashore with mitigating the threat to the Amphibious Task Force. Shipping will generally position within a fixed operating box for ease of air and surface assault operations prior to, and during, ship to objective manoeuvre.

.....  
75 Main rotor blades would normally be removed to allow the aircraft to be stowed below decks out of the salt laden environment to minimise salt corrosion/environmental degradation.

76 Coastal defences and shallow water will drive the launch point away from the coast. The distance of the objective inland, as well as availability and speed of both surface and air lift, will push it closer.

### The Pebble Island raid

Having seized the Falkland Islands in 1982, the Argentines were quick to establish a small airbase on Pebble Island, to the north-west of West Falkland. The Pucara ground attack aircraft based there posed a significant risk to the planned amphibious assault onto East Falkland.

On the night of 14 May 1982, 45 members of the D Squadron 22 SAS, supported by naval gunfire from HMS GLAMORGAN, were inserted onto Pebble Island by Sea King helicopters of 846 Naval Air Squadron embarked on HMS HERMES. Total surprise was achieved and the raid was a complete success with all 11 Argentine aircraft being destroyed at no loss to the SAS, who withdrew by helicopter back to HMS HERMES.

BRd 4487, *Amphibious Warfare*

6.21. While aircraft performance will not be affected by altitude on launch, it will still be affected by temperature, wind and air pressure. To mitigate the conflicting requirements of landing craft and helicopters, landing craft may be moved to other amphibious ships or embarked prior to conducting air manoeuvre.

6.22. Air manoeuvre helicopters will be at their most vulnerable when approaching the land over the sea as there is no terrain to mask their approach, though aircraft defensive aids suites may mitigate some threats. Both sea and land routing constraints directed by airspace management may also hamper manoeuvre.

6.23. The Amphibious Task Force can provide some local control of the air. Suppression of enemy air defences can be provided by naval fires and ship air defence missiles may be able to engage targets overland. Escorting attack helicopters can also provide support to an assault package, as can fixed-wing aircraft, if available.<sup>77</sup> Complete control of the air is unlikely, so commanders will need to balance the risk of aircraft loss against mission success.

.....  
77 Either carrier-based or launched from a nearby friendly country.

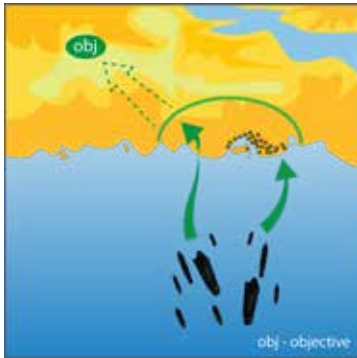
6.24. Composite air operations planning is not generally used in littoral manoeuvre. Coordinating aircraft outside of the organic assault package is achieved by synchronising aircraft activity and battlespace management. This is planned and conducted by the component commands at the operational level.



A Merlin helicopter supporting littoral air manoeuvre operations

## Section 5 – Operate

6.25. Ship to objective manoeuvre is the operational technique used by the landing force to project ashore. It seeks to create a decisive effect by using the agility of amphibious forces to strike at the points of greatest opportunity. This is achieved using a combination of surface manoeuvre, using landing craft, and air manoeuvre. Air manoeuvre is fundamental to ship to objective manoeuvre, as it gives the ability to reach beyond the shore and strike directly on the objective or secure key terrain. Air assault is the primary type of air manoeuvre used. Ship to objective manoeuvre avoids the delay typical of a classic amphibious assault where there is a requirement to build up combat power in a beachhead before moving to the objective. Figure 6.2 compares traditional amphibious assault and ship to objective manoeuvre.



### Elements of a traditional amphibious assault

- Extensive naval gunfire
- Seizure of beachhead
- Build up of combat power ashore
- Strike inland to seize objective
- Limited manoeuvre

### Elements of ship to objective manoeuvre

- Requires sea based/networked fires, logistics and command and control
- Focus on the objective
- No initial beachhead
- Rapid tempo
- Reduced footprint
- Integrated fires and high mobility
- Access to joint capabilities

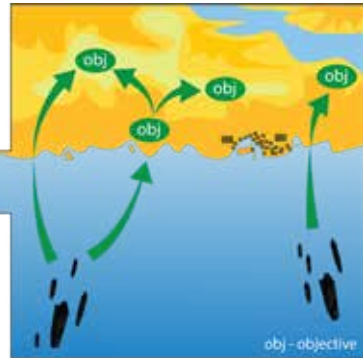


Figure 6.2 – Different types of littoral assault

6.26. Ship to objective manoeuvre planning is conducted by the Commander Amphibious Task Force staff. They produce helicopter assault landing tables that detail how the force will use and synchronise its helicopters and landing craft to support the Commander Landing Force's preferred scheme of manoeuvre.

6.27. Detailed mission planning will then be conducted by helicopter aircrew, along with assigned elements of the landing force. Given the complex nature of littoral battlespace, it is likely that both sea and air transit to the objective will use prescribed routes. Helicopters<sup>78</sup> may not have complete tactical freedom of manoeuvre until approaching, or even at, the objective area.

.....  
78 Some coalition partners use tilt-rotor aircraft for littoral air manoeuvre. The UK has no plans to procure such aircraft but they can operate from some UK shipping.



6.28. One of the key limiting factors in littoral air manoeuvre operations is ‘deck tempo’. This is the speed at which it is possible to complete a deck cycle of range,<sup>79</sup> launch and recover aircraft. The main constraint is that there are many more aircraft than deck space available. The landing platform helicopter ship has six spots designed for medium support helicopters. Chinooks each use one and a half spots while attack helicopters may require two spots clear behind during arm/disarm operations due to weapon danger areas. Efficient sequencing of loads and troops is essential to maintain deck tempo.

6.29. The number of helicopters required to provide an escorted move of a company group in one wave<sup>80</sup> requires three range and launch cycles to be completed from the landing platform helicopter ship. Ranging and launching can take more than 30 minutes, during which time the aircraft that have already launched will need to stay airborne. The first aircraft launched are likely to need fuel before they can depart on the mission. This can be reduced to two launch cycles by distributing aircraft onto other ships, known as spare decks.

6.30. To ensure effective battlespace management during the action phase, watchkeepers from all airspace users operate from the Combined Operations Room onboard the command ship. Helicopter packages liaise with the joint helicopter force watchkeeper in the ship to objective manoeuvre cell who de-conflicts with the adjacent supporting arms coordination cell. This latter cell integrates battlespace users that include naval fires, artillery, mortars and fixed-wing aircraft.

6.31. Commander Amphibious Task Force may establish a discrete operating area, known as the amphibious objective area, in which they have coordinating authority. The amphibious objective area is a three-dimensional area, which contains the landing force objectives. If task force commanders do not have the resources to control all activity within an amphibious objective area, they may instead use an area of operations, with a high density

.....  
79 Move an aircraft from a stowed position, such as the hangar, to a deck spot and configure it for flight.

80 Wave is defined as: *in amphibious operations, a formation of forces, landing ships and craft, amphibious vehicles or aircraft, required to beach or land at about the same time.* Allied Administrative Publication (AAP)-06, *NATO Glossary of Terms and Definitions*.

airspace control zone. In this instance, the Maritime Component Commander will usually manage the air, surface and subsurface environments.

### **The Amphibious Landing, Operation MUSKETEER, Suez**

The leading waves of 40 and 42 Commando came ashore at 0450 hours on 6 November 1956 facing light opposition. The marines were followed at 0500 hours by four landing craft tank that landed 14 waterproofed Centurion tanks of C Squadron, 6 Royal Tank Regiment in four and a half feet of water.

At 0520 hours 45 Commando was ordered to land within the beach area already secured by the marines. In 89 minutes, 22 helicopters flew in a total of 425 men and 23 tons of stores in four waves from the carriers situated nine miles offshore.

In many respects this was a remarkable operation. It was the first time in history that helicopters had been used in this manner during an amphibious operation. The US Marine Corps had pioneered developments in this field, but had not yet had the opportunity to put them into practice on the battlefield. Even given the improvised nature of the British force, and the rather conservative way in which it was used, the potential for helicopters to add speed and flexibility to amphibious operations was readily apparent.

Amphibious Assault, *Manoeuvre from the Sea*

6

6.32. A standing operational task air helicopter order will cover airspace control measures, communication procedures, routes, close air support and fixed-wing aircraft procedures to enter and exit the amphibious objective area. It also contains the airspace control means, airspace control order and special instructions for operating for the amphibious objective area. The procedures and instructions contained within the standing operational task air helicopter order are disseminated to the Joint Force Air Component Commander to include in the airspace control order/airspace control means where appropriate.

6.33. Commander Landing Force may deploy ashore to exert influence directly on the land battle.<sup>81</sup> The Joint Helicopter Force Headquarters staff will also move ashore to continue their role of directing operations. The decision to disembark helicopters and their life support largely depends on the ability of the shipping to remain in close proximity, driven by the maritime threat. Long ship to shore transits will favour forward basing. Logistic challenges ashore, such as fuel availability and poor maintenance conditions, will see helicopters operate more efficiently from afloat.



Operating from field locations in harsh (jungle) climate conditions

6.34. Air manoeuvre helicopters should be capable of disembarking and operating from field locations in harsh climatic conditions. One of the greatest constraints to disembarked air manoeuvre operations is the shipping space required to carry additional support vehicles alongside those needed by the landing force.

“  
Air manoeuvre helicopters should be capable of disembarking and operating from field locations in harsh climatic conditions.  
”

.....  
81 Remaining afloat will give better situational awareness; useful during a raid, for example.

## Section 6 – Protect

6.35. Air defence of the amphibious task group will normally be allocated to a destroyer through the 'Green Crown' procedure.<sup>82</sup> All aircraft entering, or launching into, the amphibious objective area must verify their identity through identification, friend or foe (IFF)<sup>83</sup> with the 'Green Crown' destroyer. All other battlespace management is planned in the command ship and executed in the combined operations room by the ship to objective manoeuvre cell, supporting arms coordination cell and the group warfare officer. This officer manages force protection for the Amphibious Task Force.

6.36. Force protection is the responsibility of the maritime force commander. Force protection air tasks will generally fall to the dedicated maritime helicopters. Air manoeuvre helicopters may also be called upon to augment maritime helicopters, although they are not optimised for the role. Wildcat<sup>84</sup> and attack helicopters are commonly used to find and attack sea surface threats – for example, fast attack craft.



A Wildcat helicopter

.....  
82 'Green Crown' is listed as a US-only procedure in Allied Tactical Publication (ATP)-8(C), *Amphibious Operations*, but has now been adopted by UK maritime forces.

83 An automatic system which allows radar operators to identify friendly aircraft.

84 Wildcat battlefield reconnaissance helicopters are primarily operated in the littoral by 847 Naval Air Squadron, part of the Commando Helicopter Force.

6.37. If there are no fixed-wing aircraft, attack helicopters may be the only fires platform beyond the range of naval gunfire support.<sup>85</sup> Attack helicopters have limited endurance; launching from distant shipping will impact on its ability to support the landing force. Wildcat may be tasked to provide direct support to troops through surveillance and coordination of indirect fires.

## Section 7 – Sustain

6.38. The Amphibious Task Force can sustain itself for 90 days, giving time to establish the Defence Support Chain from the UK. Joint helicopter force elements should embark with a deployable spares pack for 28 days flying operations. Logistics support for the return of unserviceable parts is crucial to maintaining the support chain, particularly for enduring deployments. This can be managed by Royal Fleet Auxiliaries exchanging large parts at friendly ports. Small parts can be dropped off and collected by helicopter.

6.39. First- and second-line aircraft maintenance can be conducted while embarked in a ship.<sup>86</sup> Where necessary, some third-line tasks may be undertaken to maintain aircraft availability. This includes battle damage repair carried out by 1710 Naval Air Squadron, a UK-based deployable engineering support organisation held at high readiness.

6.40. Due to the limited number of air manoeuvre helicopters and deck space, joint personnel recovery and casualty evacuation tasks are unlikely to be supported by dedicated aircraft, particularly during assault operations. All aircraft will be able to support these tasks as a secondary role and can be re-tasked while airborne.

6.41. A forward arming and refuelling point can be established ashore to improve helicopter support to the landing force. However, this requires helicopters to transport and sustain it. Fuel bowsers and supply vehicles can be delivered by landing craft once a permissive environment is achieved. They will need to be returned to shipping for refilling until the bulk fuel installation is established.

85 Mk 8 gun fires to a maximum of 22km.

86 Depending on the aircraft contractual support arrangements. Some aircraft can only receive first line maintenance. This is sometimes referred to as ‘forward and depth’ maintenance, where depth covers second- to fourth-line activities.

### Key points

- Littoral air manoeuvre is achieved using ship to objective manoeuvre.
- It is preferable for helicopters to operate for sustained periods from ships equipped with hangars as they provide environmental protection and are easier for maintenance.
- Air manoeuvre helicopters will be at their most vulnerable when approaching the land over the sea as there is no terrain to mask their approach.
- Complete control of the air is unlikely, so commanders will need to balance the risk of aircraft loss against mission success.
- Ship to objective manoeuvre is the operational technique used by the landing force to project ashore. It seeks to create a decisive effect by using the agility of amphibious forces to strike at the points of greatest opportunity.
- Attack helicopters have limited endurance; launching from distant shipping will impact on its ability to support the landing force.
- A forward arming and refuelling point can be established ashore to improve helicopter support to the landing force.

# Annex A – Air manoeuvre planning

## Planning cycles

A.1. Planning for air manoeuvre operations will draw on both the air and land planning processes. Joint air planning is conducted as part of a joint air tasking cycle. The purpose of the air tasking cycle is to plan, task, execute and assess a 24-hour period of flying operations. Planning commences 48 hours ahead of the start of flying operations and concludes with a 24-hour air tasking order (ATO), which is flown and combat assessed. A complete cycle typically covers a 72-hour time frame; however, it may be compressed to 48 hours where circumstances allow. This process is outlined below in Figure A1.

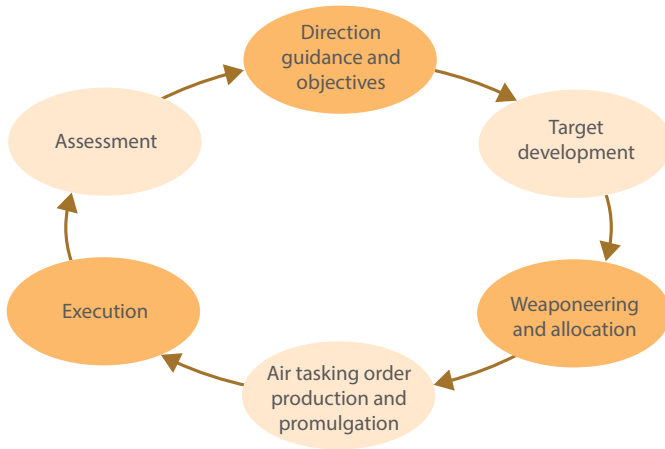


Figure A1 – The joint air tasking cycle

A.2. Targets are prioritised against the Joint Force Commander’s objective. Approved targets are then ‘weaponeered’ giving detailed target and weapon information to allow capabilities to be best allocated. This is translated into detailed tactical information that is issued through the ATO, special instructions and the airspace control order. This direction is then executed and assessed.

A.3. The joint air tasking cycle is a continual process. Each air tasking order covers a 24-hour period, so there will be three of them in use or production

at any one time. The Joint Helicopter Force uses land planning processes but coordinates with the ATO process.

A.4. It may be possible to compress timelines further, particularly for time sensitive targets. The Joint Helicopter Force Headquarters has authority to re-task assets at short notice. It may also hold force elements at readiness for this eventuality. The air planning cycle will have close air support aircraft allocated on the ATO awaiting tasks. These can be tasked at shorter notice using a joint tactical air request. Air staff officers will be able to provide advice on the detailed procedures for a particular theatre.

A.5. The UK uses Allied Joint Publication (AJP)-5, *Allied Joint Doctrine for Operational-level Planning* (with UK national elements) and NATO Allied Command Operations *Comprehensive Operations Planning Directive* (COPD) for joint planning. Land planning at the tactical level will also use the combat estimate. This process is captured within the land publication, *The Staff Officer's Handbook* and will be included in the *Command and Staff Army Field Manual*. Land planning will incorporate the Joint Helicopter Force Headquarters and the ground manoeuvre unit headquarters providing the ground manoeuvre element of the force. It will often follow a 72-hour planning cycle so it can inject into the joint air tasking cycle, though it may be reduced if the situation demands it. A small operation with minimal requirement for fixed-wing support can be planned and executed in a shorter time frame.

A

### Staff synchronisation

A.6. The land and air component staff must ensure they are embedded in each other's planning cycle to prevent any disconnect. Once fixed-wing aircraft or their units have been aligned to an air manoeuvre task, they will link in with the land planning process during three events.

A.7. Synchronisation of effort is ensured through the conduct of three events during the planning process: joint mission orders; rehearsal of concept; and the conditions check. These events are of less value for independent helicopter tasks, and apply primarily to air manoeuvre operations that deploy a ground manoeuvre force. This is outlined in more detail in Figure A2.



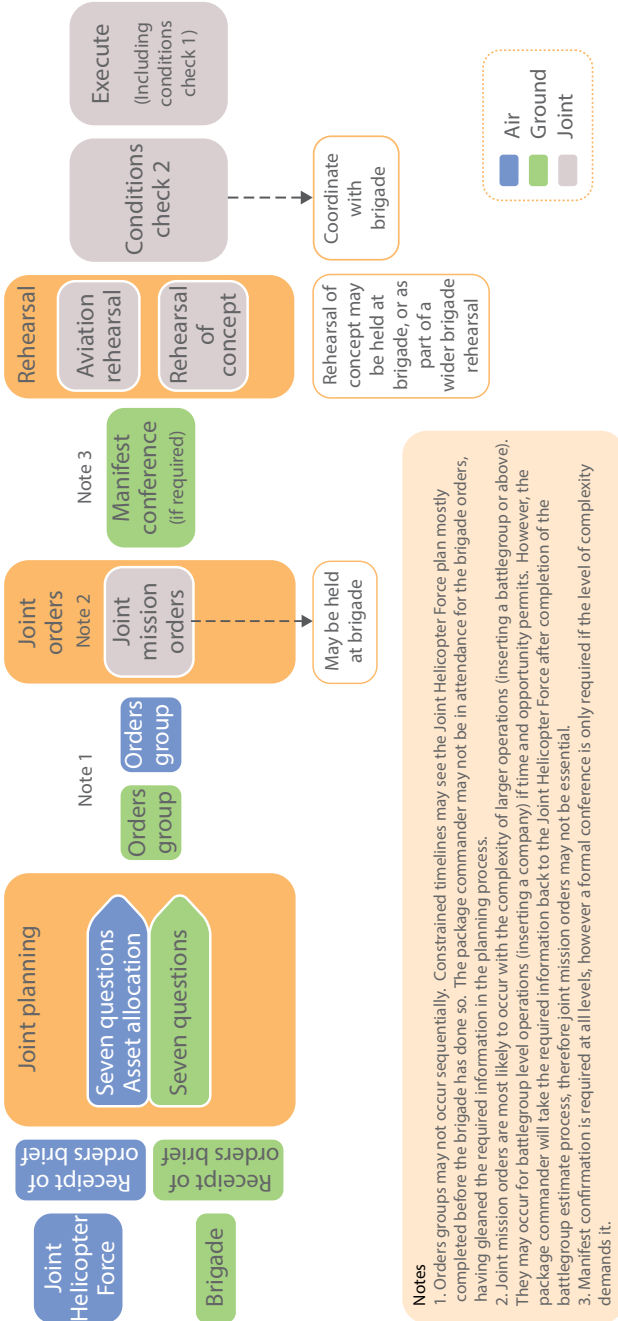


Figure A2 – Air manoeuvre operations staff synchronisation overview. Example of a joint helicopter force planning with a ground manoeuvre brigade

## Planning events

A.8. **Joint mission orders.** This occurs after the ground manoeuvre unit and joint helicopter force have delivered their orders. It acts as a cross brief to fully inform the pilots of the ground tactical plan and ground manoeuvre force of the air plan. It also defines abort criteria for the mission and confirms go/no-go criteria for the conditions checks.

A.9. **Manifest conference.** The manifest conference confirms the air movement table by finalising the loading plan and confirming the landing plan. Its purpose is essentially to finalise the allocation of troops and equipment to available aircraft. The conference should take place no later than 24 hours before the troop carrying aircraft depart from the ground force pick up point (based on a 72-hour planning timeline). This conference is less likely to be required the smaller the executing element. A single company operation may not require one – internal confirmation is sufficient.

A.10. **Rehearsal of concept.** This confirms the understanding of the plan, and is the most important planning event. The rehearsal of concept should include all pilots taking part in the operation. As a minimum the package commander should attend. The rehearsal of concept must cover the air movement and landing plans.

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A.11. **Conditions check.** The conditions check is a pre-designated list of criteria required to set the conditions for a successful air manoeuvre operations. The criteria are known as go/no-go criteria. These are basic requirements that must be met to allow the mission to take place; some will be matched to decision points. These criteria are developed during the planning process and refined during wargaming,<sup>87</sup> then briefed at the end of the joint mission orders, along with the abort criteria. The conditions checks are valuable in air manoeuvre operations due to their complexity and the distances involved. There are two conditions checks that can be used.

.....  
<sup>87</sup> Wargaming remains a vital component. The process is outlined in Allied Joint Publication (AJP)-5, *Allied Joint Doctrine for Operational-level Planning* (with UK national elements). It must include interaction between the joint helicopter force and ground force used in the operation.

- a. **Condition check 2** reviews the go/no-go<sup>88</sup> criteria. It must be completed no later than two hours before the troop-carrying aircraft departs from the ground force pick-up point. It gives commanders the opportunity to recommend the execution of the mission.
- b. **Condition check 1** is given in flight. It should be conducted between the ground tactical commander and the air package commander, who should be on the same aircraft. Condition check 1 consists of a quick review of the abort, delay and divert criteria.

A.12. **Abort criteria.** Abort criteria are considerations that occur when a change of one or more conditions in the objective area or landing site seriously threatens mission success. They require the commander to make a decision to continue, abort, divert or delay the mission. Examples could be weather changes, aircraft failure, discovery of enemy air defence or only having the minimum troops required on the ground to complete the mission. An abort decision can apply to elements of, or the whole mission. A divert decision would usually involve switching to alternate landing sites.

## Air manoeuvre in the littoral

A.13. The challenges of maritime operations necessitate significant planning differences to that outlined above. This is particularly relevant to timelines, rehearsals and synchronisation of ground and air briefings. Air manoeuvre planning in the littoral is detailed within amphibious battle procedure. This is described in Royal Navy Book of Reference (digital) (BRd) 4487, *Amphibious Warfare*, Volume 2.2, which should be used as a guide for planning air manoeuvre in the littoral.

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.....  
88 These are not 'abort' criteria.

## Air assault and airmobile groupings

A.14. A wave consists of all aircraft assigned to deliver troops or equipment that land on the landing site at the same time. A serial is a tactical grouping of two or more aircraft separated from other serials by time or space.

Figure A3 details air assault and airmobile groupings. A chalk comprises all personnel and/or equipment to be moved by a specific aircraft for each wave. A wave of four aircraft will have chawks 1-4. Each further wave will have four chawks.

- Preliminary wave – recce, artillery, for example, (may not be required).
- Assault wave – escort (attack helicopter), assault (ground force), echelon (additional troops and/or equipment) serials.
- Follow-on wave – further troops/equipment (may not be required).

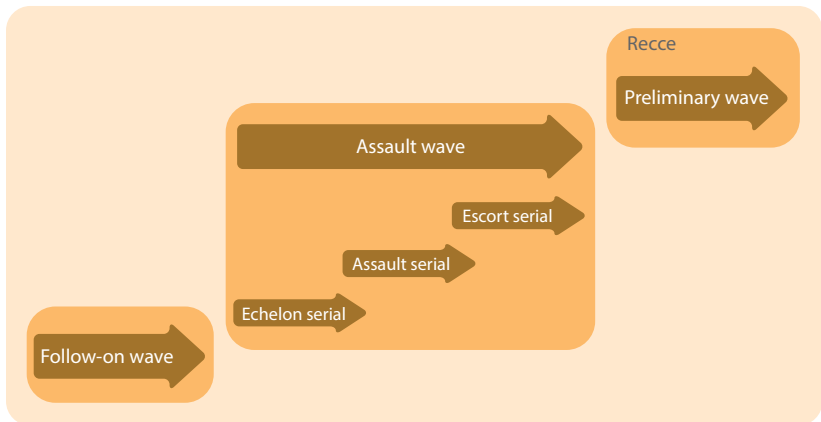
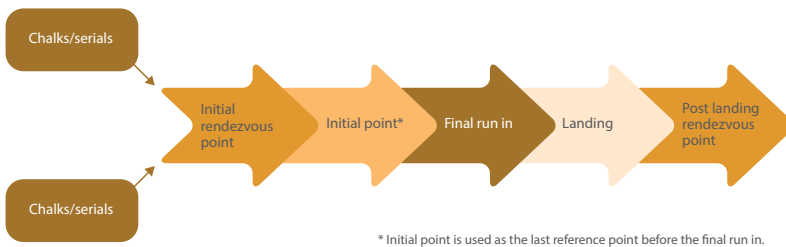


Figure A3 – Air assault and airmobile groupings

## Air movement plan

A.15. The air movement plan provides the information required to move ground force from the staging helicopter landing site to the drop-off helicopter landing site. The plan consists of five stages as shown in Figure A4. These are:

- initial rendezvous point;
- initial point – start of final run-in;
- final run in;
- landing; and
- post landing rendezvous point.<sup>89</sup>



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Figure A4 – Air movement plan stages

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89 The area used to hold casualty evacuation aircraft, airborne reaction forces and immediate resupplies.



# Lexicon

## Part 1 – Acronyms and abbreviations

AAP	Allied administrative publication
ADP	Army doctrine publication
AFM	Army field manual
AJP	Allied joint publication
ALARP	as low as reasonably practicable
AOC	Air Operations Centre
ATO	air tasking order
ATP	Allied tactical publication
AWACS	airborne warning and control system
BRd	Book of reference (digital)
BRH	battlefield reconnaissance helicopter
COMAO	composite air operation
DCDC	Development, Concepts and Doctrine Centre
Dstl	Defence Science and Technology Laboratory
HIDACZ	high-density airspace control zone
IFF	identification, friend or foe
ISR	intelligence, surveillance and reconnaissance
JCN	joint concept note
JDN	joint doctrine note
JDP	joint doctrine publication
JHC	Joint Helicopter Command
JHF	joint helicopter force
LPD	landing platform dock
LPH	landing platform helicopter
LSD(A)	landing ship dock (auxiliary)

MOD	Ministry of Defence
NATO	North Atlantic Treaty Organization
PJHQ	Permanent Joint Headquarters
RSOI	reception, staging, onward movement and integration
SPINS	special instructions



## Part 2 – Terms and definitions

This section is divided into three areas. First, we list terms and their descriptions that we use as reference for this publication only. We then list new definitions proposed by this publication and finally we list endorsed terms and their definitions which may be helpful to the reader.

### Terms used for reference in this publication only

#### **air assault**

Combined arms operations that employ helicopters to deliver an assault force onto an objective.

#### **airdrop delivery**

The air movement of personnel and/or cargo by aircraft into an objective area and their subsequent delivery by parachute.

#### **air land delivery**

The air movement of personnel and/or cargo which are landed on or near their objective by a fixed-wing aircraft.

#### **air mission commander**

The title given to the pilot in command of the aircraft package allocated to an air manoeuvre operation. (Joint Helicopter Command)

#### **air mobility**

Deploying, sustaining and recovering military and civilian personnel and materiel by air.

#### **composite air operation (COMAO)**

The composite air operation concept involves packaging a large number of joint air assets, with a variety of roles, to complement each other to achieve a task. (Air Publication 3002)

**joint helicopter force**

An organisation consisting of a headquarters and a pool of helicopters held at readiness.

**land manoeuvre**

A combination of ground and air manoeuvre, enabled by manoeuvre support.

This term is likely to be replaced by combined arms manoeuvre in the future publication of Army Doctrine Publication (ADP), *Land Operations*

**light forces**

Light forces are combined arms groups formed around the light infantry, but may be mechanised or armoured forces operating out of role. They are task-organised with combat support and combat service support. Light forces are optimised for operations in mountains, jungles and dense urban areas. They primarily fight dismounted.

**littoral manoeuvre**

The exploitation of the sea as an operational manoeuvre space from which a sea-based or amphibious force can influence situations, decisions and events in the littoral regions of the world.

*(Littoral manoeuvre Joint Capability Concept, 2008).*

**operational framework**

The arrangement of activities by purpose and effects within the battlespace. (ATP-3.2.1)

**package commander**

A pilot in command of the aircraft package allocated to an air manoeuvre operation.

**ship to objective manoeuvre (STOM)**

The operational technique used by the landing force to project ashore. It seeks to create a decisive effect by using the agility of amphibious forces to strike at the points of greatest opportunity. This is achieved using a combination of surface manoeuvre, using landing craft, and air manoeuvre.

**vertical envelopment**

Passing over the enemy's main defences to secure a key objective (for example a logistic or command node) to keep them off-balance.

(ADP, *Operations*)

## New definitions proposed by this publication

**air manoeuvre**

The movement of forces through the air to positions of advantage from which force can be applied or threatened. (JDN 1/16)

## Endorsed definitions

**air assault operation**

An operation in which air assault forces, using the firepower, mobility, and total integration of helicopter assets, manoeuvre on the battlefield under the control of the commander to engage and destroy adversary forces or to seize and hold key terrain. (NATO agreed)

**airborne**

Adjective used to describe troops specially trained to carry out operations, either by paratroop or air landing, following an air movement. (AAP-06)

**airborne force**

A force composed primarily of ground and air units organized, equipped and trained for airborne operations. (AAP-06)

**airborne operation**

An operation involving the movement of combat forces and their logistic support into an objective area by air. (AAP-06)

**airdrop**

Delivery of personnel or cargo from aircraft in flight. (AAP-06)

**airfield**

An area prepared for the accommodation (including any buildings, installations and equipment), landing and take-off of aircraft. (Note that NATO's preferred term is aerodrome). (AAP-06)

**air landed**

Moved by air and disembarked or unloaded, after the aircraft has landed or while a helicopter is hovering. (AAP-06)

**airmobile operation**

An operation in which combat forces and equipment manoeuvre about the battlefield by aircraft to engage in ground combat. (AAP-06)

**airstrip**

An unimproved surface which has been adapted for take-off or landing of aircraft, usually having minimum facilities. (AAP-06)

**attack helicopter**

A helicopter specifically designed to employ various weapons to attack and destroy enemy targets. (AAP-06)

**battlegroup**

An operational grouping which is usually based on either an infantry or tank battalion, each with at least a squadron or company of the other arm and with elements of other supporting arms and services allocated according to need. (AAP-39)

**casualty evacuation****(CASEVAC)**

The non-medicalised evacuation of patients without qualified medical escort. (AMedP-13(A))

**combined arms**

The synchronised or simultaneous application of several arms, such as infantry, armour, field artillery, engineers etc to achieve an effect on the enemy that is greater than if each arm were used against the enemy in sequence. (AAP-39)

Also used to describe the construct of an organisation that consists of several arms.

**component command**

In the NATO military command structure, a third-level command organisation with specific air, maritime or land capabilities that is responsible for operational planning and conduct of subordinate operations as directed by the NATO commander. (AAP-06)

**component commander**

A single service or functional component commander at the third level of the NATO military command structure. (AAP-06)

**control of the air**

Freedom, over a given period of time, to use a volume of airspace for our own purposes while, if necessary, denying or constraining its use by an opponent. (JDP 0-30)

**forward arming and refuelling point****(FARP)**

A temporary facility organised, equipped and deployed by a Joint Helicopter Force commander to provide fuel and ammunition necessary for the employment of helicopter units. Normally located in the main battle area ahead of the Joint Helicopter Force's normal combat service support area. (AAP-39)

**high-density airspace control zone**

Airspace of defined dimensions, designated by the airspace control authority, in which there is a concentrated employment of numerous and varied weapons and airspace users. (AAP-06)

**joint air attack team**

A combination of attack and/or reconnaissance rotary-wing aircraft and fixed-wing close air support aircraft, operating together to locate and attack high-priority targets and targets of opportunity. Joint air attack team operations are coordinated and conducted to support the ground commander's scheme of manoeuvre. (AAP-06)

**landing point**

A point within a landing site where one helicopter or vertical take-off and landing aircraft can land. (AAP-06)

**landing site**

A site within a landing zone containing one or more landing points. (AAP-06)

**landing zone**

A specified zone used for the landing of aircraft on land, water or the deck of a ship. (AAP-06)

**medical evacuation****(MEDEVAC)**

The medically supervised process of moving any person who is wounded, injured or ill to and/or between medical treatment facilities as an integral part of the treatment continuum. (AMedP-13(A))

**paradrop**

Delivery by parachute of personnel or cargo from an aircraft in flight. (AAP-06)

**restricted operating zone****(ROZ)**

Airspace of defined dimensions, designated by the airspace control authority in response to specific situations and/or requirements, within which the operation of one or more airspace users is restricted. (AAP-06)

**utility helicopter**


Multi-purpose helicopter that may be armed. (AAP-06)





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