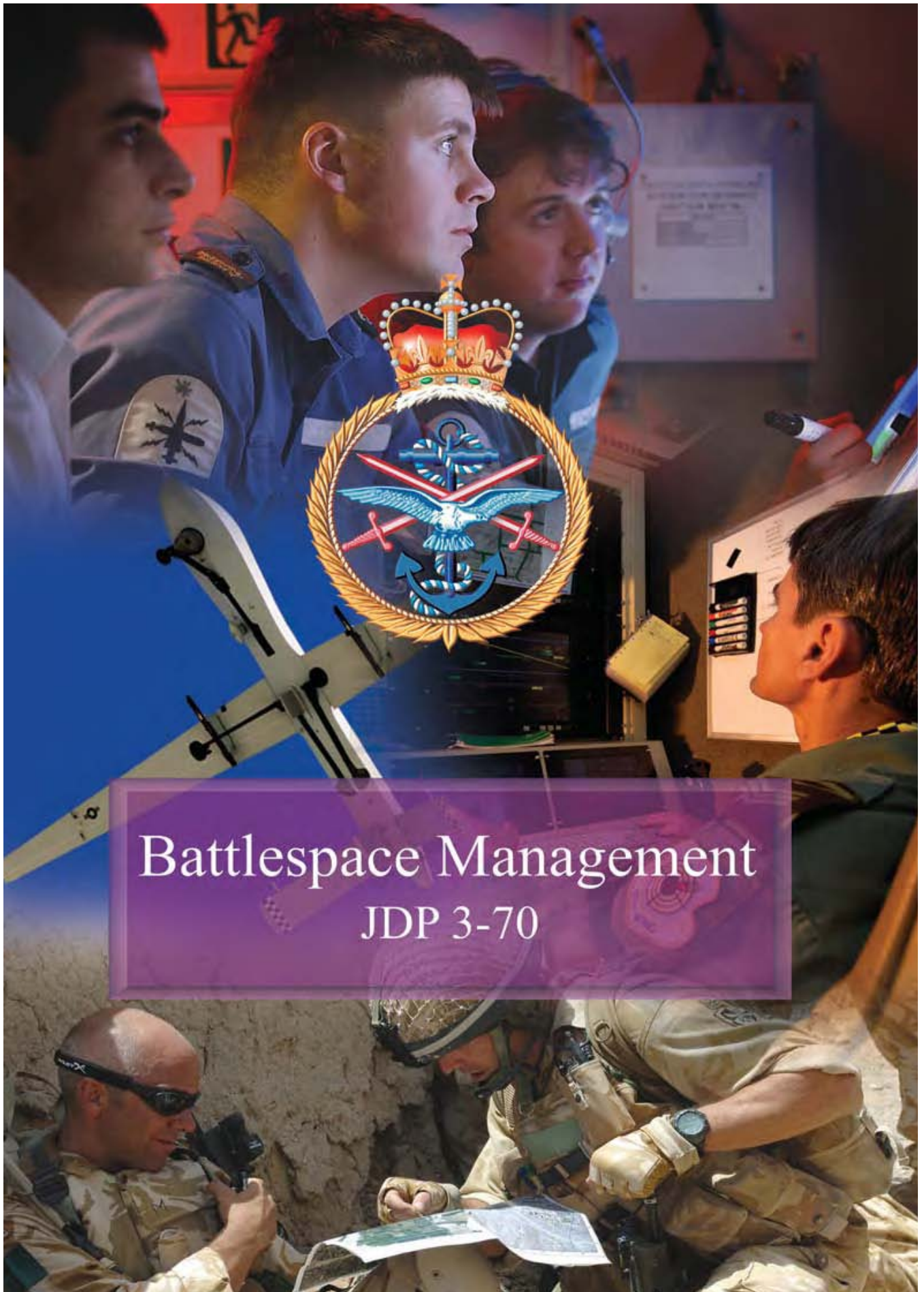


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Battlespace Management

JDP 3-70

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JOINT DOCTRINE PUBLICATION 3-70

BATTLESPACE MANAGEMENT

Joint Doctrine Publication 3-70 (JDP 3-70) dated June 2008
is promulgated
as directed by the Chiefs of Staff

A handwritten signature in black ink, appearing to read "MP Colley". The signature is written in a cursive style and is positioned above a large, hand-drawn semi-circular mark that resembles a stylized "U" or a large bracket.

Director Joint Doctrine
Development, Concepts and Doctrine Centre

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JOINT DOCTRINE PUBLICATIONS

The successful conduct of military operations requires an intellectually rigorous, clearly articulated and empirically-based framework of understanding that gives advantage to a country's Armed Forces, and its likely partners, in the management of conflict. This common basis of understanding is provided by doctrine.

UK doctrine is, as far as practicable and sensible, consistent with that of NATO. The development of national doctrine addresses those areas not covered adequately by NATO; it also influences the evolution of NATO doctrine in accordance with national thinking and experience.

Endorsed national doctrine is promulgated formally in Joint Doctrine Publications (JDPs).¹ From time to time, Interim Joint Doctrine Publications (IJDPs) are published, caveated to indicate the need for their subsequent revision in light of anticipated changes in relevant policy or legislation, or future lessons arising out of operations.

Urgent requirements for doctrine are addressed in Joint Doctrine Notes (JDNs). JDNs do not represent an agreed or fully staffed position, but are raised in short order by the Development, Concepts and Doctrine Centre (DCDC) to establish and disseminate current best practice. They also provide the basis for further development and experimentation, and a doctrinal basis for operations and exercises.

Details of the Joint Doctrine development process and the associated hierarchy of JDPs are to be found in JDP 0-00 '*Joint Doctrine Development Handbook*'.

¹ Formerly named Joint Warfare Publications (JWPs).

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RECORD OF AMENDMENTS

Amendment Number	Date of Insertion	Initials

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PREFACE

1. **Purpose.** Joint Doctrine Publication (JDP) 3-70 provides guidance to commanders on Battlespace Management (BM).² It includes governing principles for BM, describes the operational context and relevant interfaces, and outlines BM planning and execution. Although focused at the operational level, the guidance contained in JDP 3-70 is relevant to commanders at all levels.
2. **Context.** BM is a key enabler of Joint Action.³ Although BM is only strictly applicable to those under command, it is important that all actors, sharing the same operating space, are at least considered in BM; collaboration should be sought even in the absence of unity of command. Continuous changes in technology present new opportunities and new challenges for BM; in this dynamic environment, commanders should be prepared to apply judgement in the interpretation and application of the guidance contained in JDP 3-70.
3. **Structure.**
 - a. Chapter 1 outlines:
 - (1) The fundamentals of BM.
 - (2) The challenges posed by modern warfare, the role of technology, and the significance of the human interface in BM.
 - (3) Multinational, multi-agency and Joint issues that shape the conduct of BM.
 - b. Chapter 2 addresses BM planning and key issues of execution.

LINKAGES

4. JDP 01 '*Campaigning*', JDP 5-00 '*Campaign Planning*' and JDP 3-00 '*Campaign Execution*'⁴ provide overarching guidance on the planning and conduct of Joint operations, including BM. JDP 3-62 '*Combat Identification*' addresses the specifics of combat identification, a function closely linked with BM. JDP 6-00 '*Communications and Information Systems Support to Joint Operations*' provides outline guidance on Battlespace Spectrum Management. There is no specific NATO doctrine covering BM, but there are references to it in a number of Allied Joint Publications (AJPs) such as AJP-3.3.5 '*Doctrine for Joint Airspace Control*'. More

² BM is the abbreviation of Battlespace Management; BSM is the abbreviation of Battlespace Spectrum Management.

³ 'The deliberate use and orchestration of the full range of available military capabilities and activities to realise effects'. New definition developed for this publication and future UK doctrine.

⁴ All currently under revision and due to be re-issued in 2008.

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detailed information on the conduct of BM within a Joint Task Force Headquarters is contained in Permanent Joint Headquarters Joint Force Operating Procedure (JFOP) 2/06 '*Joint Battlespace Management*'. Single-Service publications provide further guidance for BM in respective environments.

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CHAPTER 1 – FUNDAMENTALS

SECTION I – PURPOSE

Introduction

101. The effective combination, or **integration**, of all elements of a Joint force to form a coherent whole, clearly focused on the Joint Task Force Commander (JTFC)'s intent, is critical to successful Joint operations. Integration of individual Force Elements (FEs) enables their activities and capabilities to be coordinated and synchronised, in accordance with clear priorities, under unified command. On multinational and multi-agency operations, the contributions of other participating nations and non-military actors should also be harmonised wherever feasible.

- a. **Coordination.** Coordination brings together different Joint force capabilities and activities into an efficient and effective relationship. Complementary aspects are united, to promote mutual support, whilst potentially incompatible aspects are de-conflicted, to preserve and make best use of available fighting power.
- b. **Synchronisation.** Coordination is enhanced by synchronisation, which sequences capabilities and activities, at appropriate tempo, in time and space. The dependency between events, and the availability of necessary resources, determines the degree of concurrent, sequential or independent activity that is possible or necessary.
- c. **Prioritisation.** Coordination and synchronisation highlight competing demands for time, space and finite resources; prioritisation determines their allocation, in accordance with the JTFC's concept of operations. As circumstances change, a JTFC should keep priorities under review to ensure that risks are analysed and managed appropriately, and that opportunities are exploited as they arise.

102. **Battlespace Management.** Integration, coordination and synchronisation are the essential tools for orchestrating a Joint force. They provide the 'who, what, when and where' of military activity throughout the Joint Operations Area (JOA).¹ Battlespace Management (BM), 'the adaptive means and measures that enable the dynamic synchronisation of activities,' provides the 'how'. BM has always been important but the nature of modern operations requires ever lower levels of command to plan and execute increasingly complex BM.

¹ 'An area of land, sea and airspace, defined by higher authority, in which a designated Joint Task Force Commander (JTFC) plans and conducts military operations to accomplish a specific mission.' (JDP 0-01.1 'United Kingdom Glossary of Joint and Multinational Terms and Definitions')

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103. Annex 1A describes the contemporary operational context. Technology provides commanders with visibility over an increasingly wide area, and improved networked communications enable them to control forces at ever greater distances. Within an expanded area of operations, a Joint force may need to operate at high tempo and with great agility. Components operating across environmental boundaries presents additional BM challenges. Furthermore, and for the time being, the UK's lack of a single BM tool – applicable across all dimensions of the battlespace – exacerbates the practical difficulties involved. Inter-component liaison, under centralised Joint Task Force Headquarters (JTFHQ) direction and control, is essential to integrate the different BM-related systems currently in use.

Defining the Battlespace

104. Battlespace encompasses '*all aspects of a JOA within which military activities take place*'. It has 7 dimensions: Maritime, Land, Air, Space, Information, Electromagnetic, and Time – none of which can be considered in isolation, as activity in one may have implications for the others.

- a. **Maritime.** Covering 70% of the Earth's surface and reaching down to the seabed, the sea constitutes a significant proportion of the battlespace.² It provides direct access to 150 coastal states and indirect access, via over-flight, to most of those without a seaboard. 70% of the world's population live within 100 miles of the sea and 80% of the world's cities are within 200 miles of the sea. Battlespace is likely to include sea and/or littoral regions.
- b. **Land.** Land covers 30% of the Earth's surface and comprises diverse surroundings from flat desert, through jungle and heavy forestation to high mountains and sheet ice. Given the growing percentage of the world's population living in towns and cities, battlespace is highly likely to include urban areas. Variables such as climate, as well as deliberate alterations to aid or impede mobility for example, can affect activities on land. Moreover, it is not just land forces that operate on land; maritime (including amphibious), air, Special Forces (SF) and logistic elements all require access to land, or at least the effects of some of their activities are likely to be realised there.
- c. **Air.** Air covers the entire surface of the Earth, extending to a finite upper limit. All components require access to the air, whether to fly aircraft or Unmanned Aerial Vehicles (UAVs) within it or to deliver weapons through it; there is considerable potential for friction between users.

² Accepting that a Joint force may not be able to exploit its entirety, in the same way that aircraft can not operate in the upper reaches of the atmosphere.

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- d. **Space.** Anything in orbit or beyond can be regarded as being in outer space.³ Despite the potential requirement for any or all components to use space, for intelligence, communications, navigation or meteorology, none yet have the capability to operate directly within it. National arrangements for space control and management are currently under development.
- e. **Information.** The information dimension of the battlespace, including cyberspace,⁴ requires particularly agile management in order to exploit emerging information technology. Information Management (IM)⁵ enables information flow and exploitation in support of effective decision-making.
- f. **Electromagnetic.** The electromagnetic dimension, or Electromagnetic Spectrum⁶ (EMS), is finite and under ever-increasing pressure due to the proliferation of electromagnetic activity. It pervades the other physical environments, providing both potential benefit (a significant source of intelligence for example) but also potential vulnerability (in being comparatively easy to disrupt or deny). While bounded by the laws of physics, it is not constrained by terrestrial borders and is freely available to any individual who attempts to exploit it. Moreover, it not only pervades the other dimensions of battlespace, but also extends beyond the confines of the JOA. Deliberate management of the EMS, referred to as Battlespace Spectrum Management (BSM), is critical to accommodate widespread reliance on the EMS; it is covered in Annex 2A.
- g. **Time.** While other dimensions describe *where* activity takes place, time is an additional dimension indicating *when* or for how long. Time is also used as a tool to orchestrate activities in other dimensions, through synchronisation or sequencing. Management of the timing and duration of activities, using a common or reference time zone throughout the JOA, underpins effective BM.

105. While applicable across all these dimensions, BM is nonetheless limited to those activities that fall within the remit of the JTFC. He may *aspire* to coordinate military activities with those of other, non-military actors within the broader operating space,⁷ but he cannot be *assured* of being able to synchronise the latter (and hence BM cannot necessarily enable it). That said, in the same way that BM across a multinational Joint force involves all components and all national contingents active

³ The boundary between air and space is blurred. The upper limit to air is the highest altitude at which an aircraft can fly (approximately 20 km), below the lowest possible satellite orbit in space (approximately 100km); the area in between is frequently termed near space. See also JSP 380 'UK Manual on Law of Armed Conflict' paragraph 12.13.

⁴ 'The notional environment in which communication over computer networks occurs'. (OED)

⁵ 'The integrated management processes and services that provide exploitable information on time, in the right place and format, to maximise freedom of action'. (JDP 6-00 'Communications and Information Systems Support to Joint Operations')

⁶ The electromagnetic dimension infers usage of the Electromagnetic Spectrum (EMS). Reflecting common practice, this publication uses the latter term to encompass both.

⁷ Encompassing 'all aspects of a JOA within which activities, *both military and non-military*, take place.'

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within the JOA, so every possible step should be taken to include non-military actors in the process of inter-agency coordination and synchronisation. A JTFC should not be dissuaded from seeking unity of effort purely by dint of lacking unity of command.

106. The extent to which inter-agency measures are practicable, or can be formalised, tends to vary from one situation to another, and to depend upon the degree to which non-military participants are willing or obliged to interact with the military. In an increasingly complex operating environment, the success of such interaction is generally underpinned by design and deliberate planning rather than good fortune. To that end, friendly and neutral actors may be persuaded to collaborate if they see it as a way of decreasing their own level of risk. Commanders should, therefore, seek a planned rather than an *ad hoc* approach to BM, and – in any given situation – expand its remit to incorporate, within relevant provisions for Operations Security (OPSEC), as many actors and activities as possible. At the very least, deliberate measures should be adopted to de-conflict military and non-military activities; ideally friendly and neutral actors should be encouraged to cooperate towards achieving shared goals.

Principles of Battlespace Management

107. **Universal Application.** BM applies at all levels of warfare. Different ‘means and measures’ are relevant at the Strategic, Operational and Tactical levels, but all activities require coordination, synchronisation and prioritisation of some sort. At the Strategic level, BM focuses on issues such as competing demands for Host-nation Support (HNS), Access, Basing and Overflight (ABO) and access to territorial waters. At the Tactical level, boundaries should be drawn between Areas of Operation (AOOs) to separate different FEs. BM at the Operational level is described in Chapter 2.

108. Boundaries and Seams.

a. In a military sense, boundaries define areas of responsibility, for example, between FEs, such as formations or units within the Land environment. An area of responsibility should not be substantially larger than that Force Element’s area of influence. Areas of responsibility should be exclusive; boundaries should not overlap. Areas of responsibility may be contiguous (where there is a common boundary) or non-contiguous (without a common boundary). Where boundaries are non-contiguous there will be areas that are unassigned; the responsibility for BM in unassigned areas remains with the higher headquarters.

b. An environmental seam is the physical space where assets operating in one environment interact with or impact on assets or activities in another environment. Maritime, land and air operations frequently take place at these seams, governed for example, by factors such as weapons systems range and penetration. As the size and depth of the seam increases, so the degree of

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complexity involved is multiplied. The air/land seam is therefore the one that poses the greatest challenge.

109. **Interaction.** Separate FEs, operating within the same battlespace, invariably interact; their respective activities impact upon each other. Not only are activities carried out within a single dimension seldom entirely independent of each other, but neither are those in one environment isolated from the influence of those in another, especially where the activities occur at the seams. BM pervades the battlespace and cannot be environmentally compartmentalised.

110. **Coordination and Control.** When FEs operate in the same battlespace, whether physical, temporal or virtual, their activities should be coordinated. Where these activities are concurrent, and cannot be physically or temporally separated, they should be subject to some form of control. The degree of control depends on the extent of their interaction and the anticipated level of battlespace resolution.

111. **Collaboration.** BM is intrinsically collaborative, both up and down the chain of command, and between levels of command. Battlespace is shared by all and no dimension is wholly owned by any one environmental component. Cooperation between environmental staffs is essential to ensure that each is aware of the others' intentions and to achieve unity of effort. Above all, however, it is the commander who retains ultimate responsibility for the battlespace allocated to him. Although he may delegate routine liaison, a commander must provide direction on BM.

112. **Context-specific.** BM cannot be templated but should be adjusted for each operation, with responsibilities for different volumes of battlespace defined accordingly. Differing levels of interaction between FEs may demand different degrees of BM, but conversely the extent of feasible BM (whether technically or procedurally constrained) may dictate the level of interaction that can be achieved, thereby potentially limiting a JTFC's freedom of action. BM, however effective, cannot negate operational risk entirely, and a JTFC's risk appetite is likely to shape his perception of necessary, as opposed to merely desirable, control in any situation.

113. **Agility.** Agility – comprising responsiveness, resilience, flexibility, acuity and adaptability – is the master principle of BM, reflecting the critical role that BM plays in enabling a JTFC to maintain tempo in dynamic and frequently chaotic and uncertain situations. Agility should not, however, become a byword for coping in the absence of proper planning (including contingency planning); well designed and properly anticipated contingencies can provide pre-scripted, yet highly responsive options for a commander. Moreover, a JTFC should apply experience and lessons from BM to improve future performance.

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SECTION II – RELATIONSHIPS AND INTERFACES

Battlespace Management, Combat Identification and Situational Awareness

114. **Combat Identification.** BM and Combat Identification (Combat ID) are inter-related; increased operational effectiveness and the avoidance of fratricide are important concerns of both. The process of Combat ID is a BM measure; it contributes to Situational Awareness (SA) and so enables more effective BM. Equally, BM contributes to SA and thereby enhances Combat ID.⁸

115. **Situational Awareness.** SA – understanding the operating environment in the context of the mission or task – provides the key to both effective Combat ID and to efficient BM. Given the inevitable ‘fog of war’, perfect SA is unlikely and a JTFC should judge for himself what represents *sufficient* SA in any given situation. As well as being one of the 3 pillars of Combat ID (SA; Target Identification; and Tactics, Techniques and Procedures), SA is crucial to the efficient synchronisation of activities. A timely, high fidelity, validated operating picture enables a commander to understand his environment and, drawing upon his intellect and experience, to make valid decisions based on the information available.

116. SA is derived from intelligence and information from a variety of sensors and sources, correlating observed activities with relevant current orders (Operations Orders (OPORDS) and Airspace Control Orders (ACOs)), and what may be known of other actors’ movements and actions. SA should be updated on a continuous basis with particular emphasis upon areas of current or planned future activity. Wherever possible, SA should be shared across a Joint force and with other relevant actors.

117. Communications and Information Systems (CIS) enable the transfer and sharing of SA.⁹ On multinational operations, however, security and other limitations of interoperability may restrict access to services such as Tactical Data Links (TDLs), Command and Control (C2) networks and near real-time intelligence broadcasts, thereby diminishing universally shared SA. Efficient IM is essential to the maintenance of SA. The volume of information available may, if not effectively managed, restrict a commander’s SA rather than enhance it.

118. **Common Operating Picture.** A Common Operating Picture (COP) is drawn up by JTFHQ on the basis of correlated, assessed and validated data from a variety of Common Tactical Pictures (CTPs). A typical COP shows, against a common geospatial and temporal reference:

- a. Boundaries, current locations and operational effectiveness of FEs.

⁸ See JDP 3-62 ‘*Combat Identification*’.

⁹ See JDP 6-00 ‘*Communications and Information Systems Support to Joint Operations*’.

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- b. Assessed locations of opponents and other actors.
119. On multinational operations, a coalition COP for example is likely to be provided, in a 'read-only' format, by the respective multinational headquarters.
120. **Common Tactical Pictures.**
- a. **Recognised Maritime Picture.** The Recognised Maritime Picture (RMP), managed by the Maritime Component Commander, depicts the locations of friendly, enemy and neutral ships. It informs the COP on a regular basis; RN ships, for example, report their positions at least every 4 hours.
- b. **Recognised Land Picture.** The Recognised Land Picture (RLP) should show the position of land forces and their operational effectiveness. Although the RLP currently remains largely aspirational, improvements in technology should enable greater fidelity in the future.
- c. **Recognised Air Picture.** The Recognised Air Picture (RAP) depicts fast moving assets in near-real time, and is consequently much more dynamic than either the RMP or RLP. It is often too changeable to feed the COP directly, and the Air Component Commander should determine the best method of updating the COP, using a combination of the ACO, Air Tasking Order (ATO) and manageable elements of the RAP.
- d. **Recognised Special Forces Picture.** The Recognised Special Forces Picture (RSFP), maintained by the Joint Special Forces Component commander, provides SF-related information.
121. **Recognised Theatre Logistics Picture.** The Recognised Theatre Logistics Picture (RTLTP) provides logistical information to complement the CTPs. It remains an aspiration for the RTLTP to provide elements of medical and personnel information derived from specialist CIS systems.
122. **Recognised Environmental Picture.** The Recognised Environmental Picture (REP) depicts information on the physical environment within the JOA through the integration of all available Geospatial Information (GEOINF)¹⁰ and Geospatial Intelligence (GEOINT).¹¹
123. **Joint Operations Picture.** The Joint Operations Picture (JOP) is the total set of information on a particular operation or JOA available through a secure information environment. It includes data from the Joint Intelligence Picture (JIP).

¹⁰ GEOINF is 'facts about the Earth referenced by geographical position and arranged in a coherent structure. It describes the physical environment and includes data from the aeronautical, geographic, hydrographic, oceanographic and meteorological disciplines.' (JDP 3-70).

¹¹ GEOINT is 'intelligence derived from the analysis and exploitation of geospatial information and imagery to describe, assess and visually depict physical features and geographically referenced activities of Defence interest.' (JDP 3-70)

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124. **Recognised Joint Picture.** The Recognised Joint Picture (RJP) is the non-real time representation of a JTFC's future plans, including battlespace requirements.

Manoeuvre

125. BM facilitates Manoeuvre¹² by allowing activities to be synchronised across all dimensions of the battlespace, and especially across environmental boundaries.

126. Manoeuvre places those seeking to create either physical or psychological effects, or frequently both, in the right time and space to do so. Manoeuvre can also realise a variety of effects in its own right, and these may be used to supplement the impact or potential impact of Fires and Influence Activities. Where it is helpful to do so, Manoeuvre may be further defined in terms of the environment(s) in which activities occur and require coordination.

a. **Single Environment.** Activities conducted within a single environment may be termed, for example, Maritime Manoeuvre – 'coordinated activities at sea, to apply force, presence or influence in order to gain an advantage in time and space'.

b. **More than One Environment.** Activities of more than one component taking place together across environmental boundaries may be termed, for example, Land/Air Manoeuvre – 'coordinated activities, across Land and Air Environments, necessary to gain advantage in time and space'.

Inter-Component Interfaces

127. Individual components have different BM requirements and a variety of procedures have developed to accommodate, for example, the different rates at which FEs move within different environments. While a fixed-wing aircraft's progress may be measured in miles per minute and a ship's in knots, a land formation's rate of progress may be kilometres per day. Separately, unitary command and centralised control of aircraft has evolved to make best use of limited assets operating across the air dimension of the battlespace at high speed. Land forces, meanwhile, operate at high-tempo and often in a highly disaggregated form but in relatively small volumes of battlespace, where interaction is potentially frequent, and friction most pronounced.

128. Components experience varying degrees of difficulty in managing their own environments, depending on the degree to which their activities or effects overlap the other environments within the battlespace. For the Air Component, there is a standing requirement to interact with the other components, as the air environment envelops both the sea and the land. The advent of longer-range weapon systems within the land

¹² 'Coordinated activities necessary to gain advantage within a situation in time and space'. (JDP 3-70)

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and maritime environments, some of which reach greatly increased apogees, inevitably affects greater volumes of the battlespace.

129. The differing ability of the various components to establish and maintain a recognised picture also has an impact on inter-component friction. For example, the Joint Force Air Component Commander (JFACC) and the Joint Force Maritime Component Commander (JFMCC) are able to compile comprehensive RAPs and RMPs respectively. Similarly, SF can be closely monitored by those who need to know. Conversely, due to the low latency of the RLP, the Joint Force Land Component Commander (JFLCC) cannot currently track land elements in anything approaching real time. This impedes the creation of a COP and, consequently, limits shared SA across a Joint force.

130. **Air-Land Interface.** Air Interdiction (AI) and Close Air Support (CAS) present particular challenges, with their requirement for synchronisation across environmental seams within a limited volume of battlespace. CAS presents the greater challenge as the potential for friction is increased when delivering weapons from the air in close proximity to friendly land forces, frequently at short notice. Close control of the battlespace is required as described in Chapter 2.¹³

131. **Amphibious Operations.** An amphibious operation, potentially incorporating the use of Naval Gunfire Support (NGS) and CAS, presents one of the most complex BM challenges and requires close control of the relevant battlespace.¹⁴ There is an extra degree of complexity added by the use of both maritime and land positioning systems in the same volume of battlespace (such as maps vs. charts, grid references vs. latitude and longitude etc). Each element involved in the operation should have a clear understanding of the agreed procedures as well as their responsibilities, freedoms and constraints.

132. **Special Forces.** SF may operate throughout a JOA, perhaps covertly, making conventional BM particularly challenging. Coordination and deconfliction between SF and other Joint force activities is facilitated by a SF Liaison Officer (LO) within the JTFHQ or a collocated SF Component HQ.

133. **Logistics.** Logistic activities should be factored into BM, both in terms of maintaining lines of communication and the protection of logistic assets and nodes.

134. **Intelligence, Surveillance, Target Acquisition and Reconnaissance.** All Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) assets needs to be directed to the 'right place at the right time'; competing requirements for

¹³ See JDP 3-62. Detailed tactical level procedures are covered in ATP-3.3.2.1 'Close Air Support Tactics Techniques and Procedures' and STANAG 3797 (FAC TTP). UK is also a signatory to the US JCAS AP MOA 2004-01 (JTAC) (Ground) dated 01 October 2007 which covers TTPs for CAS with US forces.

¹⁴ Amphibious Objective Area (AOA).

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assets need to be prioritised by JTFHQ. As importantly, however, ISTAR depends upon use of the finite EMS to relay voice or stream data. BSM is, therefore, essential to ensure that ISTAR meets prioritised information collection requirements.

Other Interfaces

135. Contemporary operations are invariably Joint, multinational and multi-agency. While a JTFC can deal readily with relationships between components under his command, relationships with other actors operating independently in the same vicinity pose separate challenges.

136. **Multinational Interface.** UK Joint forces should be prepared to operate with both traditional allies and less familiar partners within *ad hoc* coalitions. The technological capabilities of potential coalition partners may range from those with a high degree of technical interoperability to those with little or none. Furthermore, while technological interoperability remains a key issue, culture, organisational structures, doctrine, procedures and training also affect interoperability. Despite the very great importance of multinational interoperability, and interoperable BM in particular, there is currently a lack of specific Allied Joint doctrine concerning BM. In the interim, multinational operational experience and participation in multinational exercises both aid mutual understanding and interoperability, and are likely to reduce BM frictions between alliance and coalition partners. JDP 3-00 '*Campaign Execution*'¹⁵ provides additional guidance on the conduct of multinational operations.

137. **Military-Civil Interface.** Under a Comprehensive Approach (CA), a wide constituency of military and other actors should be considered and the perspectives of Other Government Departments (OGDs), International Organisations (IOs), Non-Governmental Organisations (NGOs), allies or neutrals, should all be taken into account. The manner in which a JTFC manages battlespace plays a key part in forging and maintaining external relationships, in particular where other actors feel that they have primacy, or at least an entitlement to be fully engaged. Examples include development agencies working alongside a Joint force, neutral air traffic controllers operating in bordering countries, and third parties operating in international waters.

138. The JTFC should distinguish between those other actors, whose activities are vital to the success of his mission, and those actors who are less important but nonetheless will operate in the battlespace. Under a CA, the first group should be incorporated into the planning process from the outset in order that they understand the priorities of the JTFC and have the chance to articulate their own priorities and requirements. Their involvement is likely to lead to greater understanding and cooperation, thus enabling better, and more 'comprehensive', BM. Those actors of lesser importance should be consulted when possible and kept informed.

¹⁵ JDP 3-00 is due for promulgation in 2008.

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139. The UK's CA – underpinned by institutional familiarity, trust and transparency between parties – depends upon shared SA. The engagement of OGDs, IOs and NGOs in exercises and pre-deployment planning should expose and help to resolve the potential complexities involved, although in the absence of a unified command structure, engagement of non-military organisations in BM is likely to remain a significant challenge.

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ANNEX 1A – OPERATIONAL CONTEXT

1A1. During the Cold War, Battlespace Management (BM) was largely procedural in nature and organised in a deliberate and pre-planned fashion well-suited to a known and familiar battlespace. Years of planning, refinement and practice produced a well-understood if potentially inflexible system. The UK's more recent focus on expeditionary military operations has altered the challenge of BM considerably.

1A2. It is now common for different types of military activity to take place concurrently within adjacent parts of the Joint Operations Area (JOA). For example, there may be a humanitarian crisis in one area, an insurgency in another, and intense fighting somewhere else, each with its own BM requirements. In major warfighting, the priority is likely to lie with freedom of manoeuvre for combat units and key enablers. During peace support activities, the ability to manoeuvre aviation and lightly-equipped land forces may, for example, have to be weighed against a requirement for Non-Governmental Organisations (NGOs) to conduct humanitarian missions. Moreover, political exigencies may dictate a particular approach to airspace control, particularly if the JOA is adjacent to friendly or neutral nations. Separately, operations are increasingly likely to be conducted under intense media, and hence public, scrutiny (regarding fratricide prevention, for example).

Technology

1A3. The implications of emerging technology for BM vary from one functional area to another. Information Management (IM) is a key enabler for Situational Awareness (SA) and depends on the effective use of Information Technology (IT). Joint forces are increasingly, though not uniformly, network-enabled. Air and Maritime Components currently benefit from extensive networking, largely enabled through their ability to operate from relatively few, secure locations. The Land Component has somewhat more limited access to IT-based systems, albeit a variety of operational and tactical level systems are currently being introduced into service. In the interim, while higher-level headquarters may use IT to maintain their operational picture, individual battle pictures may be plotted manually at lower tactical levels.

1A4. Some planning and management tools, with BM functionality, are already in service¹ while others are under development.² They enable increasingly quick and accurate planning and provide more dynamic control. As BM becomes increasingly IT-dependent, it is important that alliance and potential coalition partners remain interoperable or risk losing the ability to share SA.

1A5. In practice, it is unwise for BM to be entirely dependent upon, especially networked, IT. Access cannot be assured and so a reversionary capability should be

¹ Joint Automated Deep Operations Command System (JADOCS).

² Joint Effects Tactical Targeting System (JETTS).

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maintained. As a fully independent, manual backup is rarely practicable, networks should be designed to degrade gracefully, providing an opportunity to fallback on alternative systems in a controlled manner.

1A6. Technology cannot replace the human element in BM; seemingly efficient IT can diminish a commander's effectiveness if he becomes inundated with information. While he should have access to all available information on demand, it should only be 'pulled' forward when required, and 'pushed' only when mission critical.

Training

1A7. BM should be included in all training for operations. At the Operational level this should address the complexity of the Joint battlespace, as well as including multinational and multi-agency aspects as necessary.

Human Element

1A8. Individuals' ability to assimilate information and to maintain SA lies at the heart of BM. Even within the same battlespace, 2 individuals can have markedly different levels of SA. One may glean vital information that the other has missed or simply apply superior intellect or intuition to interpret information available to both of them. The cognitive ability to operate effectively within a rapidly changing battlespace can be developed and reinforced through training and experience.

Future Implications for Command and Control

1A9. An ability to communicate, in a timely manner, is vital to the sharing of SA and hence to BM. The effective orchestration of military capabilities and associated activities is, however, still likely to depend upon: clear and consistent understanding of a commander's intent; accurate and timely, high quality information and shared SA; collective and individual competence at all levels of command; and trust in information, intelligence, subordinates, superiors, peers and equipment.

1A10. Increases in operational tempo may demand even greater integration of forces and agencies. This may be enhanced, in due course, by Network Enabled Capability (NEC) providing near real-time information gathering, processing and sharing. Under a Comprehensive Approach (CA), NEC should also support the information requirements of Other Government Departments (OGDs), NGOs and International Organisations (IOs) in the operating space. However, increased activity within the Electromagnetic Environment (EME) will increase the demands place upon the Electromagnetic Spectrum (EMS). While technological advances may enable bandwidth to be exploited more efficiently, the increasing commercial and media use of the EMS may limit its availability to the military.

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CHAPTER 2 – PLANNING AND EXECUTION

SECTION I – INTERACTION AND CONTROL

201. Battlespace Management (BM) is ‘the adaptive means and measures that enable the dynamic synchronisation of activities.’ BM is seldom absolute, however, and it is for commanders to determine, in any given situation, when more or less BM is required. A commander, whose Force Elements (FEs) are operating independently in separate areas, has little need to synchronise their activities (except where limited resources need to be shared). However, a commander who envisages high levels of interaction between FEs, working in close proximity to one another, will synchronise their activities closely. He will require extensive BM. In practice, as military forces realise effects across an expanding volume of battlespace, the potential for interference between FEs, and between a Joint force and other actors, increases.

202. Levels of interaction and enabling BM are illustrated in Figure 2.1, and explained further below.

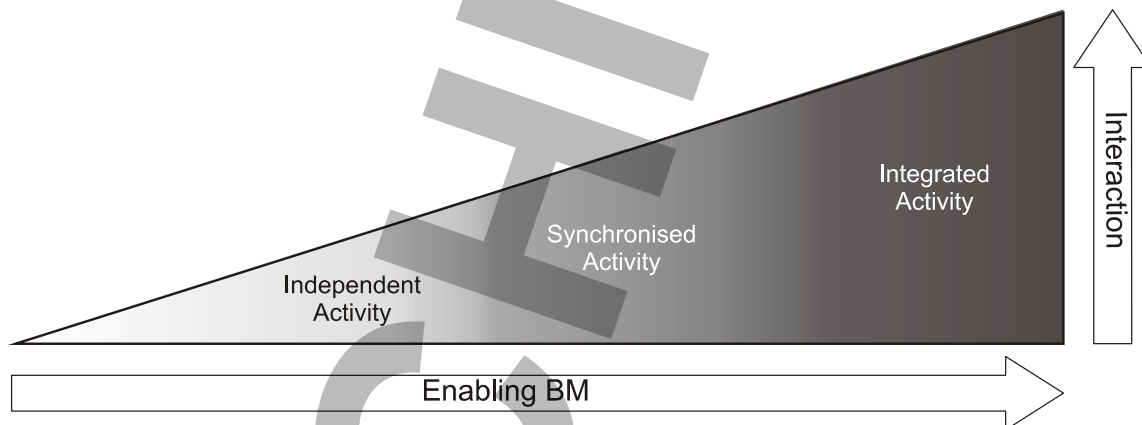


Figure 2.1 – Force Element Interaction and Battlespace Management

Independent Activity

203. The most basic form of BM is to separate actors in time and/or space such that they operate independently. Separate FEs undertake tasks in isolation, without the threat of interference, but similarly without the potential benefits that interaction may bring, such as mutual support. Activities carried out independently are simple to manage and comparatively safe, in terms of the risk of fratricide for example. Furthermore, there is little requirement for continuous routine communication, removing the need for significant contact except, when required, the exchange of liaison officers.

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204. Allocating rigid and sizeable portions of battlespace, physical or virtual, to individual users can, however, be wasteful of resources. It also significantly limits the ability to coordinate Fires, Influence Activities and Manoeuvre conducted by multiple FEs, and may deny the commander the chance to exploit fleeting opportunities. Notwithstanding the attraction of separating, for example, surface and air activities, there is always a danger of creating vulnerabilities along environmental seams, particularly where they are hard to define or frequently altering.

205. At the component level, however, physical separation of capabilities and activities retains considerable practical utility. Control measures such as fixed boundaries may usefully delineate between individual land formations' Areas of Operations (AOOs), for example, and air and maritime task groups may be restricted to 3-dimensional areas for similar purposes.

Integrated Activity

206. Fully integrated and interdependent activity sits at the opposite end of the spectrum from independent activity. An integrated force benefits from mutual awareness and understanding between FEs such that they can interact freely in the same portion of battlespace, conducting simultaneous activities with impunity. It is at this level of integration, the achievement of true Jointness, that the greatest synergies can be realised from combining component activities. FEs should use common operating procedures to share battlespace without the requirement to coordinate or de-conflict individual actions. BM of this sort should be pro-active rather than reactive, based upon thorough, and ideally shared, Situational Awareness (SA) across a Joint force, enabled by appropriate Information Management (IM).

207. Integration is currently achievable *within* components and, to a limited degree, *between* components (for example, Joint Air Defence) especially at lower tactical levels. Thorough integration across all components and at all levels remains an aspiration. A full Network Enabled Capability (NEC) may in due course enable disparate FEs across a Joint force to share battlespace and to interact comprehensively, without deliberate coordination or pre-planned de-confliction.

208. **Synchronised Activity.** Synchronised activity, within the overall construct of orchestrated activity (see Chapter 1), is the norm at the operational level. It often requires FEs to agree and commit to particular, coordinated Courses of Action (CoAs), in advance, in order to resolve anticipated conflict. It is likely to include aspects of physical separation or demarcation associated with independence as well as aspects of mutual interaction depending upon the extent of force integration. While this approach enables the efforts of otherwise discrete FEs to be concentrated, at a time and place that is anticipated to be decisive, it does not necessarily optimise use of the battlespace or provide a commander with maximum agility.

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209. *Dynamic* coordination and synchronisation of activity, where feasible, enables far greater interaction between FEs – and hence the potential for better mutual support and, ultimately, interdependence. The benefits of such freedom are clear: increased scope for mission command and enhanced operational tempo. The attendant risks should also be considered, such as that of autonomous activity – in the absence of full SA, for example – leading to fratricide. Detailed synchronisation in advance requires significant staff planning and rehearsal, but has the benefit of less risk; dynamic synchronisation possibly offers greater rewards but relies heavily on the ability of FEs, and commanders at all levels, to respond effectively to changes in the operational situation – as well as the ability of Communications and Information Systems (CIS) to enable both SA and effective Command and Control (C2).

210. **Non-Military Agencies.** A commander cannot be assured of synchronising his military activities with those of other actors under a Comprehensive Approach (CA). However, in the same way that a Joint Task Force Commander (JTFC) should pursue unity of effort across his Joint Operations Area (JOA), even in the absence of unity of command, so too he should strive for coordination – and ideally collaboration – between military and non-military actors. The guiding principles of CA apply equally to BM as they do to other aspects of multi-agency operations, in particular the benefits to be derived from proactive engagement between actors, in advance of a crisis, and the development of an agreed, shared understanding of any crisis that does subsequently emerge. In practice, it is likely that some agencies may be unwilling to collaborate with the military or indeed that Operations Security (OPSEC) may preclude a Joint force from collaborating fully itself, but in the majority of situations a JTFC should expand BM to include as many relevant actors and activities as possible.

Coordination and Control

211. When 2 or more FEs operate in the same battlespace, whether physical or virtual, their activities should be coordinated. Where these activities are concurrent, and cannot be separated, they should be subject to some form of control. The degree of control required depends on the extent to which the FEs are required to interact. The degree of control possible is dependent upon the level of shared SA across the Joint force as shown in Figure 2.2.



Figure 2.2 – Methods of Control

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212. **Procedural Control.** Procedural controls provide a straightforward method of sharing battlespace between FEs; they can, for example, be used to allocate a volume of battlespace to individual FEs for a period of time.¹ Although currently defined in airspace doctrine,² procedural controls can be applied across all environments. Procedural airspace controls segment airspace by volume and time, in combination with appropriate weapons control status. On land, procedural controls include Fire Support Coordination Measures (FSCM) to coordinate land, air and maritime fires. While pre-planned procedural control is less susceptible to disruption, it is also less flexible than other forms of control and can curtail a JTFC's ability to exploit opportunities.

213. **Positive Control.** Positive controls regulate identified FEs within designated volumes of battlespace, often using automated means such as Identification Friend Foe (IFF). Positive control does not necessarily mean overly-prescriptive management by a JTFC; it does, however, allow him to control activities in real time and, thereby, mitigate risks and exploit opportunities as they arise. An Airspace Control Authority³ (ACA) can currently identify and track FEs in the air, using IFF and radar, but this capability is not yet available across the whole JOA. Even where resolution of friendly forces is good, that of opponents and neutrals is seldom sufficiently timely or accurate to support positive control as the sole means of BM.

214. **Dynamic Procedural Control.** In the absence of positive control, a JTFC may choose to exercise procedural controls that are adapted to suit his needs in a particular situation and for a particular period of time. Dynamic procedural control still requires a pre-established architecture of control measures but presupposes that these measures can be rapidly activated and deactivated. This enables activities to be synchronised from the outset, but also to be varied in response to a changing situation.

215. The use of 'walls' for the firing of ground or maritime missiles is an example of dynamic procedural control. A wall contains a 3-dimensional volume of battlespace through which missiles can fly and from which other users are excluded. A wall can be established simply and quickly, and then refined as the missile trajectory is calculated more precisely to determine areas within the wall, both above and below the missile apogee, where aircraft can fly safely.

216. Dynamic procedural control offers some of the benefits of agility, normally associated with positive control, but it also introduces risk (of the 'dynamic' orders and procedures being misinterpreted or incorrectly applied). It also requires good SA and carries with it an additional bill in terms of staff effort, precluding its routine use

¹ AAP-6 'NATO Glossary of Terms and Definitions'.

² AJP-3.3.5(A) 'Doctrine for Joint Airspace Control'.

³ 'The commander designated to assume overall responsibility for the operation of the airspace control system in his or her assigned area'. (AAP-6)

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over prolonged periods. A JTFC usually instigates dynamic procedural control to increase tempo for a finite period of time and in pursuit of a specific outcome.

217. **Active De-confliction.** Short of positive control, but exploiting similar degrees of shared SA across a Joint force, a JTFC may choose to increase tempo further, beyond that attainable through dynamic procedural control. Given sufficient battlespace resolution, such that FEs can share with each other and the Joint Task force Headquarters (JTFHQ) position, status and intention information in near real-time, a Joint force can be managed actively – with less need for pre-planned de-confliction and greater opportunities to adjust plans in response to changes in the operational situation. Given sufficient shared SA a JTFC can use active deconfliction to minimise separation of activity in both time and space.⁴

Methods of Control

218. These methods are not mutually-exclusive and several different control are likely to be used simultaneously. As described in Chapter 1, not all the battlespace needs to be controlled in the same way, all of the time. Not every FE, or type of FE, requires positive control and a JTFC may decide to use procedural controls, such as formation boundaries, across substantial volumes of battlespace to minimise frictions inherent in interaction. Authority to control these volumes may be delegated to Component Commanders (CCs) and below, who are better equipped to manage their respective parts of the battlespace, and to facilitate access and co-use by other FEs. At the lower tactical levels where commanders synchronise activities in limited volumes of battlespace, dynamic methods of control may provide the optimum balance between agility and surety. Unless a commander employs full procedural control, however, he should ensure that he has tried and tested access to some form of reversionary mode in case one of the more dynamic (active or positive) methods fails.

SECTION II – PLANNING

219. BM should be considered early in a JTFC's planning, and appropriate BM arrangements duly developed to suit the situation at hand. These should be communicated clearly and definitively throughout a Joint force. They should not, however, be overly-complex, rigid or inflexible. Successful BM planning is underpinned by a presumption of free rather than constrained use of the battlespace, unless and until coordination and control measures are deemed necessary to facilitate interaction between FEs. The development of such measures relies upon consultation between a JTFC and his CCs to preserve freedom of action and to avoid unnecessary restrictions. Thorough analysis of the operating environment should provide a JTFC

⁴ Current systems in use are Joint Automated Deep Operations Coordination System (JADOCS) and Joint Effects Tactical Targeting System (JETTS).

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and his staff with an appreciation of the factors, specific to each dimension of the battlespace, that are likely to require BM.

220. Subsequent BM planning is based upon:
- a. Situation-specific 'battlespace conditions', established in advance and applied across the JOA.
 - b. Centralised BM planning and direction, emanating from the JTFHQ but involving as broad a 'BM constituency' as necessary.
 - c. Specific delegations to appropriate commanders and other authorities to manage particular aspects of the battlespace.

Initial Battlespace Conditions

221. Initial conditions for use of the battlespace are set out in the Force Instruction Document (FID):⁵ time, geographic and environmental data; delegated responsibilities for specific volumes of battlespace; and physical boundaries. While boundaries may be adjusted as an operation progresses, reference data should remain unchanged. Wholesale change of such data during an operation may expose a Joint force to extensive friction, and potential loss of tempo. Even local or temporary variations should only be considered in the light of thorough risk assessment. For example, the consequence of mixing WGS-84 and ED50⁶ data for safety-critical matters could have significant ramifications. The requisite data are described below.

222. **Time Reference.** The FID should state whether the Joint force is to operate using LOCAL time or an alternative, such as ZULU. GPS-provided Position, Navigation and Time (PNT) data provides the universal time reference.

223. **Geographic Datum.** The FID should set the geographic datum (such as WGS-84) on which an operation is to be conducted, and the coordinate system (for example, Lat/Long, World Geographic Reference System (WGRS), Military Geographic Reference System (MGRS), Ordnance Survey Great Britain (OSGB)), and height reference (for example, Above Mean Sea Level (AMSL)). While components and individual FEs may, in some circumstances, use different coordinate systems for their own purposes, a single format should be agreed and specified as the coordination standard, for planning and communication between elements of the Joint force.

224. **Common Reference System.** As a complement to the agreed geographic datum, a JTFC may direct use of a simplified Common Geographical Reference

⁵ Detailed information is contained within the PJHQ JFOP 2/06 'Joint Battlespace Management'.

⁶ World Geodetic System 1984 (WGS-84) and European Datum 1950 (ED50) are commonly-used chart data that employ different chart projection methods; hence they may define different values of latitude and longitude for a given geographical point on the earth's surface.

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System (CGRS), to readily define and label 2-dimensional geographical areas of the battlespace, normally for use at the Tactical level.⁷

225. Alternatively, the Global Area Reference System (GARS) may be used. GARS is a US standardised battlespace area reference system based on lines of longitude and latitude, which provides an integrated common frame of reference for joint force situational awareness to facilitate BM. Primarily designed as a battlespace management tool, it is not used for navigation or targeting.

226. **Boundaries.** A Joint Commander assigns a JOA to a JTFC, and sets any necessary conditions regarding movement into and out of the JOA, relationships with adjacent JOAs, pertinent diplomatic agreements and civilian airspace control.⁸ A JTFC may then specify conditions upon components, reflecting political, diplomatic and legal – as well as physical and operational – considerations. The management of physical spaces within the JOA is likely to be allocated to respective CCs.

Battlespace Management Groups

227. A JTFC retains ultimate authority and responsibility for BM; however, he is likely to delegate routine authority to his Chief of Staff (COS). The COS addresses the wide range of issues involved through a Battlespace Management Group (BMG),⁹ combining relevant J35 (Future Ops) and J33 (Current Ops) staffs. In practice, a BMG is likely to be J3-led and to operate in concert with the JTFHQ's routine campaign rhythm, being subsumed within Joint Effects Meetings (JEMs) where appropriate. Although drawing upon expertise from across the JTFHQ, and potentially from component HQs, it is important that members of the BMG should train together. They require expertise and levels of collective performance to employ not only traditional process-driven methods of BM, but also the increasingly important dynamic methods to facilitate synchronised activity. While BM and the BMG are ostensibly military, consideration should be given to extending its composition to include others whose activities within the JOA may impact upon the Joint force.

228. The first task of a BMG is to set the initial conditions for use of the battlespace, described above, without being overly prescriptive as to *how* it is to be managed. BMG staff, in conjunction with components who enjoy a detailed knowledge of environment-specific considerations and potential frictions, then formulate specific BM plans and procedures. BMGs within subordinate HQs address BM issues, at increasing levels of resolution, appertaining to their respective components.

⁷ Information on CGRS is contained within the PJHQ JFOP 2/06.

⁸ For example, it should not be assumed that military aircraft will necessarily enjoy unfettered freedom of action throughout a campaign. Civilian airspace procedures were reinstated in Iraq shortly after the cessation of major combat operations in May 2003. Notwithstanding its potential impact on operations, this was seen as an important indication, to the international community in particular, of Iraq re-establishing its own sovereignty.

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Structures and Relationships

229. Although based upon a core membership, the composition of a BMG is likely to be adjusted (and potentially augmented) to suit the needs of a particular Joint force and the operation at hand. Component Liaison Officers (LOs), including Special Forces Liaison Officers (SFLOs), play a significant role in identifying areas of potential inter-component friction and consequent requirements for BM. Operations across environmental boundaries, such as air/land and amphibious operations, benefit from the exchange of LOs co-opted to relevant JTFHQ and component HQs' BMGs.

230. BM may also require external engagement and liaison for a variety of reasons. Activities in the electromagnetic environment, for example, are likely to impact on military and non-military actors alike and their effects may not even be contained within a JTFC's own JOA. Battlespace Spectrum Management (BSM), therefore, is highly likely to involve a range of interested parties beyond the JTFHQ itself. Geographically and functionally, BM liaison may also be required with other nations and civilian organisations upon whom activities of the Joint force impact, or vice versa. In some circumstances, such as during a Non-combatant Evacuation Operation (NEO) or a Disaster Relief Operation (DRO), a JTFC may seek to co-opt members of relevant civilian organisations to his BMG rather than simply relying upon *ad hoc* liaison, through his Civil-military Cooperation (CIMIC) staff for example.

231. Liaison depends upon effective communication, either between collocated staffs or via CIS between separate headquarters or other organisations. Robust voice communications are a minimum; networked communications that enable collaborative planning software, for example, greatly assist near real-time BM.¹⁰ In the case of the latter, and provided that the network is well-protected against technical failure and opponent action, and its reliability can be assured, then the demand on Inter-Component Coordination and Liaison (ICCL) may be greatly reduced.¹¹

Delegation

232. A JTFC is likely to delegate responsibility for control of certain volumes of battlespace within the JOA to individual CCs. This process does not imply ownership or priority of use, nor does it bestow any degree of operational or tactical control of particular FEs. Areas for such delegation are described below.¹²

233. **Maritime Battlespace Management.** Maritime Battlespace Management (MBM), covered in detail in ATP-1(D) Volume I '*Allied Maritime Tactical Instructions and Procedures*', is addressed as follows:

⁹ Information on BMG composition, terms of reference and modus operandi is contained within the PJHQ JFOP 2/06.

¹⁰ 'Sharepoint' and 'JChat', for example, have been used on recent operations to improve the sharing of SA.

¹¹ See JDP 3-00 '*Campaign Execution*' due for promulgation in 2008.

¹² More detailed information on delegated BM responsibilities is contained within the PJHQ JFOP 2/06.

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- a. **Waterspace Management.** The Joint Force Maritime Component Commander (JFMCC) is normally delegated responsibility for Waterspace Management (WSM) throughout the JOA. Anti-Submarine Warfare (ASW) Force operating areas and attack rules are coordinated by the Submarine Operating Authority (SUBOPAETH) on behalf of the JFMCC.
- b. **Naval Cooperation and Guidance for Shipping.** Naval Cooperation and Guidance for Shipping (NCAGS) is governed by international treaty and covers protection of merchant shipping under the Regional Naval Control of Shipping organisation. Participation in the scheme is voluntary, although some governments make it compulsory for all vessels under their flag.
- c. **Amphibious Operations.** Fleet Battle Staffs conduct BM planning for amphibious operations, undertaken in an allocated Amphibious Objective Area (AOA) and associated High Density Airspace Control Zone (HIDACZ).¹³
- d. **Maritime/Land Interface.** Not all operations involving the maritime/land interface are conducted within a formally allocated AOA; some may, for example, be littoral. As with any activity taking place along an environmental seam, there is the potential for friction. Procedural controls (such as boundaries) can assist, and appropriate provision made for BSM to address the significant volume of naval system emissions within the EMS.

234. **Land Space Management.**¹⁴ Unlike the Air and Maritime environments, responsibility for the Land environment is unlikely to be delegated to a single component. The Joint Force Land Component Commander (JFLCC) is likely to require a significant proportion of land battlespace, simply to deploy his forces. However, the Joint Force Logistics Component Commander (JFLogCC) also requires real estate and the Joint Force Air Component Commander (JFACC) needs real estate for basing and, possibly, air defence.¹⁵ The Joint Force Special Forces Component Commander (JFSFCC)'s requirements are likely to vary, though he may from time to time require exclusive use of sections of the land battlespace.

235. **Airspace Management.** The JFACC is normally appointed as the ACA and Air Defence Commander (ADC),¹⁶ responsible *inter alia* for Airspace Management (ASM). The ACA function is provided through the Joint Airspace Control Cell (JACC), manned by air staff officers and representatives from the other components.¹⁷

¹³ Full details are contained in ATP-8(B) 'Doctrine for Amphibious Operations'.

¹⁴ Previously referred to as Terrain Management although this term is now obsolete.

¹⁵ The JFACC, in his role as ACA, is also likely to be nominated as the Air Defence Commander (ADC).

¹⁶ Air Defence Commander is 'a duly appointed commander responsible for the air defence of a designated area'. (AAP-6)

¹⁷ Full details of the JACC are contained in AJP-3.3.5.

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236. **Battlespace Spectrum Management.** BSM is conducted through a BSM Cell within the JTFHQ, normally part of J3/5 but it can also be a J6 role. The remit of BSM is extremely broad, reflecting the all-encompassing nature of the Electromagnetic Environment and the increasing reliance placed upon the EMS, both by military forces and others. BSM requires close engagement with, not only spectrum stakeholders across the Joint force, but also with Host Nation(s), multinational and multi-agency partners to enable efficient, shared use of the EMS (as other aspects of BM enable shared use of physical aspects of the battlespace). Annex 2A contains further details of BSM.

Iterative Battlespace Management Planning

237. BMGs are likely to be engaged continuously during high-tempo operations. On the other hand, if initial battlespace conditions endure and Joint force capabilities and activities can be successfully synchronised using in-place measures, then BM may require little more than routine supervision. An enduring peacekeeping operation, for example, within set boundaries, with a steady-state force structure and with high levels of shared SA, may place few demands upon an established BMG. In practice, the timing and frequency of BM meetings should reflect changes in the planning and/or operational tempo, and be responsive to new or evolving operational risks.

Risk Analysis and Management

238. Risk pervades operational planning, and a JTFC should determine the steps necessary to protect his Joint force from foreseeable threats and provide the capability to seize opportunities as they arise. Risk analysis identifies sources of risk, and assesses its likelihood, potential impact and ownership. It is an integral part of planning, continuously reviewed and adapted to the changing situation. The following stages of risk analysis should be followed in BM planning:

- a. **Identify Risk.** Risk identification involves recognising what might go wrong and how it could happen. Examples include: conflicting demands for airspace, resulting in assets from more than one component operating in a congested area, leading to the risk of collision; and competing demands for the use of a land line of communication, leading to the possibility of congestion at choke points. Risk identification helps to indicate potential BM requirements.
- b. **Assess Risk.** Risk assessment seeks to understand the likelihood of the activity or event occurring, and the potential severity of the outcome. Risks vary from low impact, low probability to the high impact, high probability; the latter risks are those likely to cause mission failure.

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239. **Risk Management.** Risk management reduces the possibility of any unexpected risk materialising, mitigates its consequences should it do so, and exploits any opportunities as they arise. A JTFC may deal with risks in a variety of ways:

- a. **Terminate.** Termination is the complete removal of a risk. This may be achieved by changing the plan so that the risk is completely removed. Termination may be the 'least risky but most painful' course of action.
- b. **Treat.** Treating a risk reduces its likelihood or mitigates any adverse outcomes. Many BM measures are themselves a form of risk treatment. The better the situational awareness and control of the variables, the more precisely a risk can be assessed and treated. Active synchronisation of activities, enabled by BM, aims to reduce the risk of unfavourable outcomes.
- c. **Tolerate.** A JTFC may decide to tolerate a risk without treating it if he considers it to be of sufficiently low impact and/or likelihood.
- d. **Transfer.** Where it is not possible to terminate or treat a risk and a JTFC is not content to tolerate it, he may decide to transfer it. Risk may be transferred by a JTFC, from one FE to another, that he considers better able to cope with it, perhaps due to better equipment or training.

240. **Opportunities Enhanced through Battlespace Management.** Component commanders with a clear understanding of the JTFC's intent should be enabled, by effective BM, to grasp fleeting opportunities presented by unforeseen events and turn them to advantage. Responsibility for BM should be delegated sufficiently to present tactical commanders with the minimum of constraints and the maximum possible freedom to manoeuvre in response to changes in the situation.

SECTION III – EXECUTION

241. BM is inherently active, as unforeseen events (including opponent action) influence commanders' priorities and the conduct of operations. A JTFHQ requires an effective method for pro-active, as well as reactive, BM. This is likely to entail no-notice gatherings of the BMG, unless an individual has been delegated the authority to provide immediate solutions within pre-defined parameters.

Allocation Changes

242. **Boundaries.** A permanent or temporary boundary change between components is the most common amendment to battlespace allocation. Such changes provide agility and can increase tempo, but – if too rapid and frequent – can cause confusion and increase the potential for fratricide.

243. Where boundary changes are required the following should be considered:

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- a. Impact on current and planned operations.
- b. Priority of use, in terms of both where the Main Effort lies and the capabilities of the forces and agencies involved.
- c. Disposition of friendly, opponent and neutral parties.
- d. Speed and assurance of communication across the Joint force.

244. **Fire Support Coordination.** Responsibility for the Fire Support Coordination Line (FSCL) lies with the JFLCC or JFMCC, depending upon circumstance. However, agreement for its placement should be reached with the JFACC through the BMG and, if consensus cannot be reached, the JTFC should arbitrate. Any relocation of the FSCL needs to be communicated to, and acknowledged by, all battlespace users before it is changed. Historically, the FSCL has been aligned with a geographically significant feature to assist operators at the tactical level with its identification. However, as weapon ranges increase, and modern equipment permits simpler and more accurate positional awareness, use of a significant geographical feature is becoming less of a constraint. CGRS provides an alternative method of rapidly and accurately defining the FSCL.

Assessment

245. While BM means and measures realise no effects *per se*, they do enable the synchronisation, and hence impact upon the efficacy, of activities as part of the JTFC's concept of operations. One of the challenges of BM is measuring success. If an operation is a success, it could be suggested that the BM had been one too. However, this fails to recognise that the disproportionate effect that improvements to BM can have on the conduct of operations and, therefore, the rate at which the success is achieved.

246. Assessment is designed to indicate not only whether the requisite activities and effects were carried out and realised respectively but also, if they were not, then why not and how things might be done better in future.¹⁸ It is in this regard that deductions regarding BM are included within the overall assessment process. Indicators of ineffective BM may include:

- a. High incidence of fratricide.
- b. Loss of operational tempo due to conflict between activities of individual FEs.
- c. Failure to grasp fleeting opportunities due to:

¹⁸ See JDP 3-00 for a full explanation of Assessment.

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- (1) An inability to flex forces rapidly into one area from another.
 - (2) The presence of other actors in the area.
- d. In extremis, mission failure.

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ANNEX 2A – BATTLESPACE SPECTRUM MANAGEMENT

2A1. The Electromagnetic Spectrum (EMS) is widely used on military operations. Competing demands need to be strictly coordinated and controlled. Battlespace Spectrum Management (BSM) is defined as ‘the planning, coordination and management of the EMS through operational, engineering and administrative procedures; it enables military electronic systems to perform their functions within intended environments without causing or suffering harmful interference’.¹

2A2. BSM is primarily a J3/5 function although the detailed management of the EMS is often delegated to J6. Managing the EMS presents some unique challenges, as it cannot be defined in physical terms. Efficient use of the EMS provides an operational advantage to a Joint Task Force Commander (JTFC) and enables optimum spectrum use through deconfliction, protection, exploitation and denial of this valuable resource within the Joint Operations Area (JOA). Without robust BSM procedures, however, electromagnetic interference is likely to occur with temporary or permanent loss of access to systems.² Failure to implement proper BSM procedures is likely to hamper manoeuvre and reduce tempo; at worst, it could result in electronic fratricide.

Linkages

2A3. Effective and timely BSM can only be achieved through the efforts of staff from a number of disciplines training and working, using common doctrine. JDP 3-70 addresses the overarching BSM issues; JDP 6-00 ‘*Communications and Information Systems Support to Joint Operations*’ sets out the structures of the Spectrum Working Group (SWG) and C2 arrangements, and AJP-3.6 ‘*Allied Joint Doctrine for Electronic Warfare*’ details responsibilities and procedures on NATO operations.

Principles

2A4. **Sovereignty.** The EMS is a sovereign asset. Cooperation and coordination should be undertaken with Host Nations (HNs) and affected friendly or neutral parties, such as neighbouring states or International Organisations (IOs).

2A5. **Interaction.** As parts of the EMS cannot be used concurrently, its shared use has to be coordinated and synchronised in time, frequency and space. JTFC-endorsed Information Exchange Requirements (IERs) should guide BSM.

2A6. **Delegation.** BSM should be exercised at the highest level of command. Use of specific frequencies can be delegated to subordinates, whilst recognising that they may not be best placed to coordinate with sovereign authorities and other agencies requiring access to the EMS.

¹ Allied Communications Publication (ACP) 190(B) ‘*Guide to Spectrum Management in Military Operations*’.

² Such as computer networks, radar warning receivers, radios and electronic surveillance equipment.

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2A7. **Efficiency.** BSM provides efficient use of the available EMS, by a combination of protection, deconfliction, and exploitation. Battlespace Spectrum Dominance, for example, denies an opponent the opportunity to use the spectrum (while still permitting its use by other authorised users, such as Other Government Departments (OGDs), Non-Governmental Organisations (NGOs), coalition partners and HNs). Where possible, BSM should be capable of accommodating changing requirements and responding to unforeseen interference.

Process

2A8. The BSM Cell, as the regulatory body,³ is responsible to the JTFC for the coordination and authorisation of fixed and temporary spectrum assignments⁴ to meet the requirements of spectrum stakeholders throughout the JOA.⁵ BSM is based on centralised control and frequency assignment by a BSM Cell, and decentralised authority for the use of specific frequencies, using a BSM Plan. This is achieved through close coordination of all spectrum stakeholders as detailed in Figure 2A.1.

2A9. BSM requires close engagement with spectrum stakeholders including:

- a. JFCIS/Joint Network Centre (Jt NETCEN) Frequency Manager (FMAN) for CIS requirements.
- b. J2 (Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR)) for Unmanned Aerial Vehicle (UAV) and GUARDED frequencies to the Joint Restricted Frequency List (JRFL).
- c. Electronic Warfare Coordination Cell (EWCC), to coordinate Electronic Attack (EA), Electronic Surveillance (ES), Electronic Defence (ED) and issue the JRFL.
- d. Force Protection Electronic Countermeasures (ECM(FP)).
- e. Tactical Data Links Authority (TDLA).
- f. Government Communications Officer (GCO) for Signals Intelligence and Electronic Intelligence (SIGINT/ELINT) requirements.
- g. J3 for lethal/non-lethal effects on the EMS or its users.

³ Regulation includes adoption of not just military, but also civilian procedures, in accordance with the International Telecommunications Union (ITU).

⁴ Authority for an equipment to use a frequency channel under specific conditions.

⁵ The detailed roles and responsibilities of the EMS stakeholders in a NATO operation are set out in AJP-3.6(A) 'Allied Joint Doctrine for Electronic Warfare'. More detail on procedures within a UK JTFHQ are set out in PJHQ JFOP 2/06.

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- h. OGDs for CIS or other requirements.⁶
- i. Media Operations and Information Operations (Info Ops) for support to broadcast requirements.
- j. Maritime, Land and Air Components for requirements including navigation radar, ground-to-air communications, tactical mobile radar, Missile Approach Warning Systems and EA (including attacks on navigation systems (Navigation Warfare (NAVWAR))).

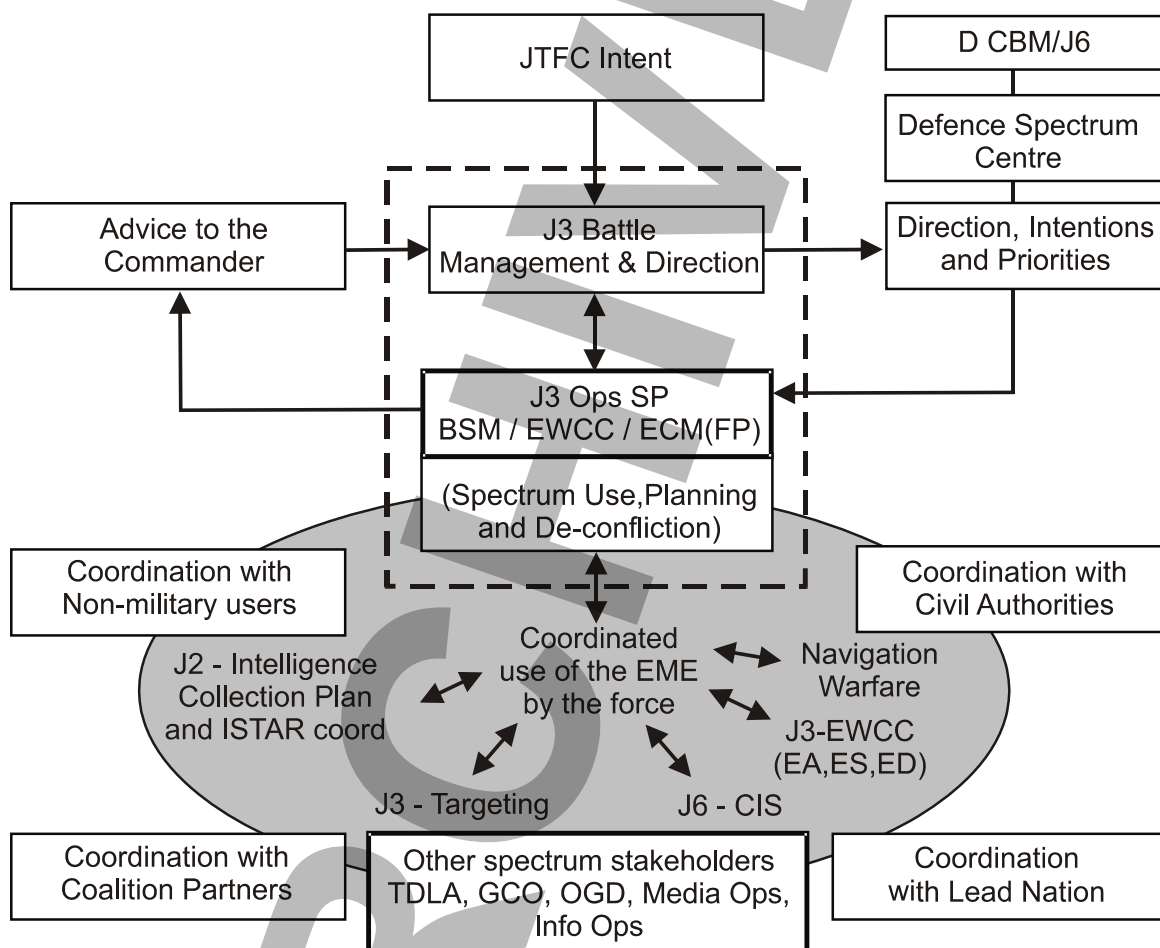


Figure 2A.1 – BSM Function

2A10. MOD is responsible for establishing an EMS strategy in conjunction with the Defence Spectrum Centre (DSC).⁷ The DSC, in conjunction with the BSM Cell, then

⁶ Such as the Foreign and Commonwealth Office or Department for International Development may be deployed with a JTFHQ, separately, or as an Inter-agency Planning Team (IAPT), as part of a Comprehensive Approach (CA).

⁷ The DSC provides assistance to deployed UK BSM elements for direction, intentions and priorities whilst also making available reach back support in the form of technical skills, advice and guidance.

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melds the JTFC's intent with this strategy to formulate the BSM plan in close cooperation with all spectrum stakeholders, and any HN.

2A11. Successful implementation of the BSM plan relies on up-to-date spectrum intelligence, compiled from the widest possible sources, including anecdotal records and dynamic spectrum monitoring with strategic, operational and tactical assets.

2A12. In a multinational operation, the Lead Nation establishes a Combined BSM Cell (CBSMC). Participating nations deploy a national BSM Liaison Officer (LO) to work in the CBSMC as well as establishing their own national or regional BSM Cell.

Planning

2A13. Initial planning for a Joint Force identifies the Joint IER. To determine spectrum requirements, multiple requirements for spectrum resources are identified, merged and prioritised. Those elements of the Jt IER that require EMS allocation are coordinated and consolidated into the force spectrum bill or EMS resource requirement. This requirement is passed to the BSM Cell to consolidate all spectrum requirements and liaise with the HN civil spectrum management authority to gain approval.

2A14. Where there is no civil spectrum management authority, or the political/strategic situation prevents liaison from taking place, anecdotal spectrum records, together with real-time spectrum monitoring and available SIGINT, provides a best-estimate spectrum resource from which to provide assignments and allotments.

2A15. Once a HN issues spectrum assignments or allotments, they are sub-issued to the appropriate requesting authority. For example, assignments and allotments to support JFCIS (including components) are issued to the JFCIS/Jt NETCEN FMAN, who in turn issues them to the relevant system manager or component FMAN.

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PART 1 – ACRONYMS AND ABBREVIATIONS

ABO	Access, Basing and Overflight
ACA	Airspace Control Authority
ACO	Airspace Control Order
ADC	Air Defence Commander
AI	Air Interdiction
AM	Air Manoeuvre
AMSL	Above Mean Sea Level
AOA	Amphibious Objective Area
AOO	Area of Operations
AOR	Area of Responsibility
ASM	Airspace Management
ASW	Anti-Submarine Warfare
BM	Battlespace Management
BMG	Battlespace Management Group
BSM	Battlespace Spectrum Management
C2	Command and Control
CA	Comprehensive Approach
CAS	Close Air Support
CATF	Commander Amphibious Task Force
CC	Component Commander
CGRS	Common Geographical Reference System
CLF	Commander Landing Force
CoA	Course of Action
Combat ID	Combat Identification
CIMIC	Civil-military Cooperation
CIS	Communications and Information Systems
COP	Common Operational Picture
COS	Chief of Staff
DRO	Disaster Relief Operation
EBA	Effects-Based Approach
EInt	Electronic Intelligence
EInf	Electronic Information
EME	Electromagnetic Environment
EMS	Electromagnetic Spectrum
FE	Force Element
FID	Force Instruction Document

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FSCL	Fire Support Coordination Line
FSCM	Fire Support Coordination Measure
GEOINF	Geospatial Information
GEOINT	Geospatial Intelligence
HIDACZ	High Density Airspace Control Zone
HN	Host Nation
HNS	Host-Nation Support
HQ	Headquarters
ICCL	Inter-Component Coordination and Liaison
IM	Information Management
IO	International Organisation
ISTAR	Intelligence, Surveillance, Target Acquisition and Reconnaissance
IT	Information Technology
JACC	Joint Airspace Coordination Cell
JADOCS	Joint Automated Deep Operations Command System
JDP	Joint Doctrine Publication
JETTS	Joint Effects Tactical Targeting System
JEM	Joint Effects Meeting
JFACC	Joint Force Air Component Commander
JFLCC	Joint Force Land Component Commander
JFLogCC	Joint Force Logistics Component Commander
JFMCC	Joint Force Maritime Component Commander
JOA	Joint Operations Area
JOP	Joint Operations Picture
JSOA	Joint Special Operations Area
JTFC	Joint Task Force Commander
JTFHQ	Joint Task Force Headquarters
LO	Liaison Officer
MBM	Maritime Battlespace Management
MOA	Measurement of Activity
MOE	Measurement of Effect
NCAGS	Naval Cooperation and Guidance for Shipping
NEC	Network Enabled Capability
NEO	Non-Combatant Evacuation
NGO	Non-Governmental Organisation
NGS	Naval Gunfire Support

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OGD	Other Government Department
OMC	Operational Management of CIS
OPSEC	Operations Security
OSGB	Ordnance Survey Great Britain
PSO	Peace Support Operations
RAP	Recognised Air Picture
RLP	Recognised Land Picture
RMP	Recognised Maritime Picture
SA	Situational Awareness
SACA	Subordinate Airspace Control Authority
SE	Supporting Effect
SF	Special Forces
SFLO	Special Forces Liaison Officer
SOI	Standard Operating Instruction
SOP	Standard Operating Procedure
SSA	Shared Situational Awareness
STOM	Ship to Objective Manoeuvre
SUBOPAATH	Submarine Operating Authority
TDL	Tactical Data Link
TST	Time Sensitive Targets
TTP	Tactics, Techniques and Procedures
WGRS	World Geographic Reference System
WGS	World Geodetic System
WSM	Waterspace Management

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PART 2 – TERMS AND DEFINITIONS

The primary references for terms and their definitions are indicated in parentheses.¹ Those marked (JDP 3-70) are either new or have been modified and will be incorporated in JDP 0-01.1 ‘*UK Glossary of Joint and Multinational Terms and Definitions*’ following ratification and subsequent promulgation of this publication.

Airspace Control Authority

The commander designated to assume overall responsibility for the operation of the airspace control system in his or her designated area. (AAP-6)

Amphibious Objective Area

A geographical area, delineated in the initiating directive, for purposes of command and control within which is located the objective(s) to be secured by the amphibious task force. This area must be of sufficient size to ensure accomplishment of the amphibious task force’s mission and must provide sufficient area for conducting necessary sea, air and land operations. (AAP-6)

Amphibious Operation

A military operation launched from the sea by a naval and landing force embarked in ships or craft, with the principal purpose of projecting the landing force ashore tactically into an environment ranging from permissive to hostile. (AAP-6)

Area of Operations

1. At the operational level, the geographical area defined by the operational level commander within his JOA in which a commander designated by him (usually a component commander) is delegated authority to conduct operations.
2. At the tactical level, a geographical area, defined by lateral and rear boundaries, which is assigned to a commander by a higher commander. Within these boundaries the commander has the authority to conduct operations in order to execute his mission. (JDP 0-01.1)

Battlespace

All aspects of a Joint Operations Area within which military activities take place subject to Battlespace Management. (JDP 3-70)

Battlespace Management

The adaptive means and measures that enable the dynamic synchronisation of activity. (JDP 3-70)

¹ JDP 0-01.1 ‘*United Kingdom Glossary of Joint and Multinational Terms and Definitions*’, AAP-6 ‘*NATO Glossary of Terms and Definitions*’.

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Battlespace Spectrum Management

The planning, coordination and management of the electromagnetic magnetic spectrum through operational, engineering and administrative procedures; it enables military electronic systems to perform their functions within intended environments without causing or suffering harmful interference. (JDP 3-70)

Close Air Support

Air action against hostile targets which are in close proximity to friendly forces and which require detailed integration of each air mission with the fire and movement of those forces. (AAP-6)

Combat Identification

The process of combining situational awareness, target identification, specific tactics, training and procedures to increase operational effectiveness of weapon systems and reduce the incidence of casualties caused by friendly fire. (JDP 0-01.1)

Components

Force elements grouped under one or more component commanders subordinate to the operational level commander. (JDP 0-01.1)

Composite Air Operations

Air operations interrelated and/or limited in both timescale and space where units differing in type and/or role are put under a single package commander to achieve a common, specific objective. (JDP 0-01.1)

Control

1. That authority exercised by a commander over part of the activities of subordinate organisations, or other organisations not normally under his command, which encompasses the responsibility for implementing orders or directives. All or part of this authority may be transferred or delegated.
2. In mapping, charting and photogrammetry, a collective term for a system of marks or objects on the earth or on a map or a photograph, whose positions or elevations, or both, have been or will be determined. (AAP-6)

Datum

Any numerical or geometrical quantity or set of such quantities which may serve as reference or base for other quantities. Where the concept is geometric, the plural form is 'datums' in contrast to the normal plural 'data'. (AAP-6)

Electromagnetic Environment

The totality of electromagnetic phenomena existing at a given location. (AAP-6)

Environment

The surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation. (AAP-6)

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Fires

The deliberate use of physical means to support the realisation of, primarily, physical effects. (JDP 3-70)

Fire Support Coordination Line

Within an assigned area of operations, a line established by a land or amphibious force commander to denote coordination requirements for fires by other force elements which may affect the commander's current and planned operations. The fire support coordination line applies to fires of air, ground or sea weapons using any type of ammunition against surface or ground targets. The establishment of the fire support coordination line must be coordinated with the appropriate commanders and supporting elements. Attacks against surface or ground targets short of the fire support coordination line must be conducted under the positive control or procedural clearance of the associated land or amphibious force commander. Unless in exceptional circumstances, commanders of forces attacking targets beyond the fire support coordination line must coordinate with all affected commanders in order to avoid fratricide and to harmonize joint objectives. (AAP-6)

Note:

1. In the context of this definition the term 'surface targets' applies to those in littoral or inland waters within the designated area of operations.

Fratricide

The accidental death or injury which occurs when friendly forces engage their own forces believing either them, or their location, to be an enemy target. (JDP 0-01.1)

Geospatial Information (GEOINF)

Facts about the Earth referenced by geographical position and arranged in a coherent structure. (JDP 3-70)

Note:

1. It describes the physical environment and includes data from the aeronautical, geographic, hydrographic, oceanographic and meteorological disciplines.

Geospatial Intelligence (GEOINT)

Intelligence derived from the analysis and exploitation of geospatial information and imagery to describe, assess and visually depict physical features and geographically referenced activities of Defence interest. (JDP 3-70)

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/airspace users. (AAP-6)

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Host Nation

A nation which, by agreement:

- a. receives forces and materiel of NATO or other nations operating on/from or transiting through its territory;
- b. allows materiel and/or NATO organizations to be located on its territory; and/or
- c. provides support for these purposes. (AAP-6)

Host-Nation Support

Civil and military assistance rendered in peace, crisis or war by a host nation to NATO and/or other forces and NATO organisations which are located on, operating on/from, or in transit through the host nation's territory. (AAP-6)

Information Management

Integrated management processes and services that provide exploitable information on time, in the right place and format, to maximise freedom of action.
(JDP 6-00 3rd Edition)

Joint Action

The deliberate use and orchestration of the full range of available military capabilities and activities to realise effects. (JDP 3-70)

Joint Airspace Control Cell

A joint cell with appropriate representation from the components and, if applicable, host and coalition nations, to provide the Airspace Control Authority with the capability to plan, coordinate, integrate and regulate airspace control within the Joint Operations Area. (JDP 0-01.1)

Joint Enablers

Operational activities that do not have an end unto themselves and are unlikely to be discrete lines of operation in achieving the end-state. Their principle purpose is to enable other activity to take place. (JDP 3-70)

Joint Force

A force composed of significant elements of two or more Services operating under a single commander authorised to exercise operational command or control.
(JDP 0-01.1)

Joint Operations Area

An area of land, sea and airspace, defined by higher authority, in which a designated Joint Task Force Commander plans and conducts military operations to accomplish a specific mission. A Joint Operations Area including its defining parameters, such as time, scope and geographic area, is contingency/mission-specific. (JDP 0-01.1)

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Joint Operations Picture

The total set of shared information on a particular operation, or Joint Operations Area, available through a secure information environment on CIS networks to support situational awareness and decision-making by UK commanders, and to facilitate information sharing with allies and partners. (JDP 0-01.1)

Joint Task Force Commander

The operational commander of a nominated joint force. (JDP 0-01.1)

Joint Task Force Headquarters

A purely national deployable joint headquarters of variable size commanded at the operational level by a Joint Task Force Commander. (JDP 0-01.1)

Liaison

That contact or intercommunication maintained between elements of military forces to ensure mutual understanding and unity of purpose and action. (AAP-6)

Mission Analysis

A logical process for extracting and deducing from a superior's orders the tasks necessary to fulfil a mission. (JDP 0-01.1)

Operations Security

The process which gives a military operation or exercise appropriate security, using passive or active means, to deny the enemy knowledge of the dispositions, capabilities and intentions of friendly forces. (AAP-6)

Operations Support Activities

Operational activities that, being capabilities or techniques likely to be essential to achievement of the end-state, have an end unto themselves. They will usually, but not always, form specific lines of operation and are underpinned by Joint Enablers. (JDP 3-70)

Positive Control

In air traffic control within NATO, a method of regulation of all identified air traffic within a designated airspace, conducted with electronic means by an air traffic control agency having the authority and responsibility therein. (AAP-6)

Procedural Control

A method of airspace control which relies on a combination of previously agreed and promulgated orders and procedures. (AAP-6)

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Recognised Air Picture

An electronically-produced display from primary and secondary radar, and ESM sources covering a three-dimensional volume of interest in which all detected air and surface contacts have been evaluated against specific threat parameters and then assigned a recognition category and track number. (JDP 0-01.1)

Recognised Land Picture

The fullest achievable agreed level of identification and tracking of all land surface contacts in the area of interest. The Recognised Land Picture is normally associated with the Recognised Air Picture of the same area. (JDP 0-01.1)

Recognised Maritime Picture

The fullest achievable agreed level of identification and tracking of all surface and sub-surface contacts in the area of interest. The Recognised Maritime Picture is normally associated with the Recognised Air Picture of the same area. (JDP 0-01.1)

Situational Awareness

The understanding of the operational environment in the context of a commander's (or staff officer's) mission (or task). (JDP 0-01.1)

Time Sensitive Targets

Time sensitive targets (TST) are those targets requiring immediate response because they represent a serious and imminent threat to friendly forces or are high payoff, fleeting targets of opportunity. In practice, TSTs are specific target sets designated by the JTFC. (JDP 0-01.1)

Waterspace Management

In naval warfare, a system of procedures for the control of antisubmarine weapons to prevent inadvertent engagement of friendly submarines. (AAP-6)