

# Royal Air Force Command and Control 1982–2014

Air Historical Branch (RAF)



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## **General Introduction**

Effective command and control (C2) is fundamental to the efficient application of any form of military power, whether air, land or maritime. It may not guarantee victory, and successful operations may be mounted even when C2 provisions are weak or obviously defective. However, efficient C2 is certainly a key determinant of mission success and its absence will, at the very least, make success more difficult to achieve.

The critical importance of C2 in air operations has been clear since the First World War, and the subject of air C2 has been a central focus in the writing of air power scholars, theorists and practitioners over many decades since. Where the RAF is concerned, it is an issue that has arisen in the context of such historic operations as the Battle of Amiens in 1918, the Battle of Britain in 1940, the subsequent British campaign in North Africa, the Allied invasion of Sicily in 1943 and, perhaps most of all, the campaign to liberate northwest Europe in 1944. After the Second World War, air C2 became a prominent focus in the history of the Malayan Emergency of the 1950s.

The aim of this study is to bring our knowledge and understanding of this important issue more up to date by drawing on Air Historical Branch (AHB) narratives covering six operations spanning a period of more than thirty years: these are Corporate (the Falklands, 1982), Granby (the First Gulf War, 1990-91), Allied Force (Kosovo – UK operation name Kingower, 1999), Telic (the Second Gulf War, 2003), Herrick (Afghanistan, 2004-14) and Ellamy (Libya, 2011). The objective is to produce a single cohesive and accessible source charting the theory, practice and development of UK operational air C2 during the RAF's more recent history.<sup>1</sup>

It is not suggested that this account represents an entirely comprehensive history of the RAF's experience of air C2 in the operations under consideration; more could probably be written where all six are concerned. However, further coverage would have enlarged an already lengthy survey beyond manageable proportions, and the parameters of this study do at least ensure that valuable elements of continuity and cohesion extend across its component chapters. It is primarily concerned with the salient features of the air C2 story as recorded in contemporary documents and correspondence, post-operation reports and lessons papers. It is also a history of human endeavour – of the most demanding tasks and of how they were addressed, of the problems encountered and solutions adopted. Recurring themes include C2 structure and organisation, the distribution of authority and responsibility within command hierarchies, operational planning, the decision-action cycle, targeting and Rules of Engagement (ROE).

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1. A project of this nature was first suggested at an Operation Shader Mission Exploitation conference held at Air Command in November 2016.

The six operations proved illuminating because of the wide variety of scenarios they encompassed. Corporate was a UK operation, Allied Force, Herrick and Ellamy were NATO operations and Granby and Telic involved US-led coalitions. Corporate was primarily maritime, Granby, Allied Force and Ellamy relied largely on air power, while the Land Component played lead role in Telic and Herrick. Telic was mounted against a conventional adversary, while Herrick was a counter-insurgency (COIN) operation. Corporate and Ellamy were launched at virtually no notice, but there was considerably more lead time where Telic was concerned. In terms of duration, the shortest was Telic, which involved major combat operations for less than a month, while the longest was Herrick, which was sustained for a period of ten years. The range and scope of air C2 assignments, challenges, approaches and outcomes could hardly have been more diverse.

The RAF's experience of air C2 in the period under review was profoundly influenced by the spectacular transformation of the strategic background. In the post-Second World War years there was no necessity for the RAF to develop a deployable air C2 capability as the UK still possessed a network of command headquarters and air bases around the world. Subsequently, the UK defence focus turned decisively towards NATO and a C2 infrastructure based on fixed UK and European facilities, and it was not until the 1980s that C2 provision for Out-Of-Area (OOA) operations was once more seriously considered. This reorientation was then accelerated by the end of the Cold War, which heralded a period of more regular military operations of a deployed or expeditionary character. Yet although live operations became far more frequent, the defence budget was slashed along with the service manpower base. The RAF's trained strength declined from (in round figures) 82,000 in 1980 to 33,000 in 2014. The British armed forces gradually adapted to the new strategic environment but were confronted by innumerable obstacles along the way, and the demands imposed by consecutive OOA commitments had always to be balanced against the UK's enduring support for NATO.

Change was no less in evidence at the operational level. Operational command arrangements in the UK and most other countries were comprehensively overhauled. Traditional state-on-state conflict continued, but there was an increasing tendency for adversaries to rank as 'non-state actors'. Planned air campaigns made way for more dynamic and flexible approaches to the utilisation of air power, and the concept of 'jointery' evolved steadily. Unguided weapons were still in general use in the 1980s and 90s, but Precision-Guided Munitions (PGMs) appeared in ever-increasing numbers. The implications for air-to-ground targeting and ROE took time to clarify. The information age arrived, bringing spectacular capability enhancements to air platforms and equipment as well as the transformation of C2 via Network-Enabled Capability (NEC). Air commanders and their staffs had to adapt accordingly.

Predictably enough, this was not a straightforward process. Indeed, despite the critically important role of air power in modern warfare and the apparently shared interest of the three armed services in maximising the advantages that the air medium confers, air C2 has consistently been the subject of friction. This has related sometimes to the structure and sometimes the function of C2 mechanisms; on other occasions, it has resulted from political pressures or the actions of particular personalities. Whatever the cause, there has been a consistent tendency to argue in retrospect – sometimes in tones of considerable frustration – that the true potential of air power was unfulfilled as a direct consequence. And yet, while it has rarely been difficult to suggest ways in which air C2 might have been improved, it has been far harder to implement measures that are broadly accepted as optimal air C2 solutions. It has been easier to identify lessons than to address them.

This conundrum cannot be solved by history alone; equally, it is rare for history to repeat itself from one conflict to the next. Yet it still has a valuable role to play. Strategy may change over time, organisations may be redesigned and technology radically improved, but many of the basic influences on C2 remain relatively constant. History can therefore provide a useful tool for air practitioners with C2 responsibilities not necessarily by solving problems but by helping to explain how and why they may occur. If this study helps to provide a means to that end, it will have achieved its basic purpose.

Doctrine must serve as our starting point. The importance of C2 is fully reflected in the amount of space devoted to the subject in RAF and NATO doctrinal publications, and the analysis presented here would be incomplete without careful consideration of the subject. It is impossible to understand the practical application of air C2 in major operations without grasping how airmen thought about it – without appreciating their underlying assumptions and the C2 principles they sought to apply.

## UK AIR COMMAND AND CONTROL DOCTRINE

Typically, 'command' is now defined as the authority vested in an individual of the armed forces for the direction, coordination and control of military forces. 'Control' is defined as the authority exercised by a commander over part of the activities of subordinate organisations, or other organisations not normally under his command, that encompasses the responsibility for implementing orders or directives. The doctrinal principles underpinning the exercise of air C2 evolved significantly in the period covered by this study, reflecting the strategic transformation already described as well as the revolution in communications and information technology. Throughout the 1970s and 80s, the RAF produced no air doctrine of its own. Such doctrinal activity as the RAF undertook involved contributions to emerging NATO publications, which largely addressed Cold War scenarios. The end of the Cold War witnessed a renewed interest in independent national doctrine, and the first edition of AP3000, *British Air Power Doctrine*, was prepared by the RAF's Director of Defence Studies (D Def S) for the Air Staff in 1990 before the outbreak of the First Gulf War. It was slightly revised over the next three years to take account of the Gulf operation but not fundamentally altered.

After the Gulf War, the Air Warfare Centre (AWC) was established at RAF Waddington and assigned specific responsibility for the production of UK air warfare doctrine. The AWC produced the first edition of the *Air Operations Manual* in 1996; follow-up editions of both AP3000 and the *Air Operations Manual* then appeared at the end of the decade. All three publications reflected the comprehensive overhaul of UK defence policy since the end of the Cold War and accumulating operational experience. In 2006, the *Air Operations Manual* was replaced by AP3002, *Air Warfare*, and the fourth edition of AP3000 followed together with the second edition of AP3002 in 2009. Both documents were prepared at a time when the RAF was engaged in protracted counter-insurgency operations in Iraq and Afghanistan. Responsibility for UK air power doctrine subsequently passed to the Defence Academy's Development, Concepts and Doctrine Centre, while the Air Warfare Centre retained ownership of AP3002.

Air C2 was a somewhat contentious issue in NATO in the 1970s. The enduring air principles where C2 is concerned are (1) centralised command and (2) decentralised execution. Centralised C2 promotes an integrated effort and allows air power to be employed to meet recognised overall priorities. It also permits air operations to be redirected quickly to exploit fleeting opportunities, respond to changing demands and be concentrated at the critical time and place to achieve decisive results. Decentralised execution recognises that no single commander can direct personally all the detailed actions of multiple air units or service personnel. Decentralisation is therefore essential and is accomplished by delegating appropriate authority to execute tasks and missions.

These principles were broadly agreed between the RAF and the USAF, which provided the lead elements in the 2nd and 4th Allied Tactical Air Forces (2 and 4 ATAF) in NATO's central region. However, they differed in their interpretation of centralised command and decentralised execution. According to a RAND study prepared in 1987, 2 ATAF emphasised co-ordinated decisions between air and ground elements at echelons of command close to the battle area, with air power applications taking place beyond the range of organic ground force firepower.

The 2 ATAF concept of command and control encourages the local coordination of national air and ground forces whenever possible and for managing combat aircraft has adopted 'procedural control' methods that reduce the need for costly infrastructures.<sup>2</sup>

By contrast, the USAF C2 concept was considerably more centralised:

4 ATAF achieved firepower flexibility and responsiveness through a complex array of command and control centers and an associated system for data processing and secure communication. This permitted the *positive control* of aircraft and the in-flight diversion of sorties to new targets.<sup>3</sup>

In the production of ATP-33, *NATO Tactical Air Doctrine*, a compromise was required to produce a document acceptable to both air forces and also to the US Navy and the Marine Corps. The agreed text laid down that 'Operational control of available air resources is exercised by a central, designated air commander at the highest practicable level.' This wording provided enough flexibility to accommodate differences of opinion as to what constituted 'practicability', and the term 'highest practicable level' has since reappeared in numerous air doctrine publications. Nevertheless, from the RAF's perspective, it implied some degree of decentralisation and forward collaboration between air and surface commanders. Equally, it served as a warning against centralising command to an impracticable extent.<sup>4</sup>

It is therefore perhaps surprising that, in keeping with the other services in the 1970s and early 80s, the RAF retained an operations staff and operations facilities at the MOD level, and the command relationship between the MOD and the Front-Line Commands (FLCs) was not clearly laid down in the relatively small number of official Defence publications generated in this period. The

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2. David J. Stein, *The Development of NATO Tactical Air Doctrine, 1970-1985* (RAND, 1987), pp. v-vi.

3. Stein, *NATO Tactical Air Doctrine*, p. 18.

4. Stein, *NATO Tactical Air Doctrine*, p. 20.

operational headquarters role shifted decisively away from the MOD in the mid-1980s, but this still did not entirely settle the issue.

In 1990, AP3000 again embraced the concept of centralised command at the highest practicable level, which was now defined as ‘that at which relative priorities of combined/joint demands on air resources can best be assessed’.<sup>5</sup> It also stressed that control should not be exercised from too high a level, as this could produce inflexibility and inefficiency. In other respects, AP3000 drew heavily on NATO doctrine, employing NATO definitions of C2, emphasising the critical importance of unity of command, and pointing out that there would rarely be enough air resources to meet all demands: tasking priorities would invariably have to be set.<sup>6</sup> Air C2 process and organisation were addressed in broad terms, with process broken down into four stages:

- 1) Analyse the situation.
- 2) Plan – develop a plan or concept of operations.
- 3) Direct – issue orders and directives.
- 4) Control – monitor the progress of the operation and assess results.<sup>7</sup>

The basic organisational construct envisaged the commander himself, his staff and his headquarters facilities.

AP3000 went on to describe four levels of assignment – allotment, apportionment, allocation and tasking. It argued that allotment, apportionment and allocation ‘should be made in accordance with priorities established between specific tasks’, a judgement that effectively ruled out any other basis for determining the division of resources.<sup>8</sup> It also considered the relationship between assisted and assisting commanders and supported and supporting commanders, stressing the need for the commander of the assisted force to indicate in detail to the assisting commander the support missions he wished to have fulfilled.<sup>9</sup> Similarly, when air operations were supporting land or maritime objectives, or land or naval forces were operating in support of air objectives,

The supporting commander and the supported commander(s) and their staffs should work as a team throughout the period from the creation of joint/combined surface/air plans to their final execution.<sup>10</sup>

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5. AP3000, *Royal Air Force Air Power Doctrine* (1990), p. 35.

6. AP3000 (1990), p. 34.

7. AP3000 (1990), pp. 36-37.

8. AP3000 (1990), p. 39.

9. AP3000 (1990), p. 40.

10. AP3000 (1990), p. 40.

Beyond this, AP3000 considered the characteristics required of an air control organisation in terms of flexibility, mobility, survivability, interoperability, communications and information process and display infrastructure. It described centralised and decentralised air control structures and the exercise of air control from the level of land and maritime forces, as well as airborne control assets, and defined positive and procedural control.<sup>11</sup>

The role of the MOD was described as the ‘coordination of all policy and administrative matters affecting the fighting services’ including ‘the conduct of operations’. However, the clarity of this statement was subsequently undermined somewhat and left open to interpretation by an acknowledgement that ‘within the guidelines determined by Ministers, the Ministry of Defence is responsible for the higher direction of operations ... through the Ministry of Defence Joint Operations Centre.’<sup>12</sup>

By the early 1990s, computerisation was serving to facilitate the more centralised USAF C2 concept, and the Gulf War had witnessed the first live operational appearance of the now familiar Combined Air Operations Centre (CAOC) and the Air Tasking Order (ATO) and Airspace Control Order (ACO) processes. Their effectiveness in conventional warfare scenarios was established beyond doubt. It is thus not surprising that the first *Air Operations Manual*, while again espousing centralised air C2, no longer sounded any warnings about over-centralisation (although it did caution against over-centralised *planning*). The manual also reflected the development of the component command system in the UK, the US and NATO, with the Air Component commanded by a Joint Forces Air Component Commander (JFACC) exercising command from a Joint Forces Air Component Headquarters (JFACHQ) and control through a CAOC. Under the component system, all component commanders were subordinated to a Joint Force Commander (JFC).<sup>13</sup> He would discharge his functions primarily through the medium of the so-called Joint Targeting Coordination Board (JTCB).

The Board is chaired by the JFC, or his most senior deputy, and is attended by all the component commanders, senior representatives from the JFC’s staff and representatives from subordinate units, as required by the JFC. The JTCB will advise the JFC on optimisation and prioritisation of targets theatre wide and the associated daily apportionment of all assets. It is the forum for deconfliction of other operations, such as Special Forces. It is at this meeting that the Target Nomination List (TNL) is drawn from the Joint Prioritised Integrated Target List (JPITL) and approved by the JFC for a particular ATO. This results directly in the production of the

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11. AP3000 (1990), pp. 41-45.

12. AP3000 (1990), pp. 142, 144.

13. *Air Operations Manual* (Air Warfare Centre, 1996), p. 3.I.4.

Master Air Attack Plan (MAAP).<sup>14</sup> The ultimate aim of the JTFC is clear and unequivocal guidance from the JFC as to the direction of the headquarters staffs and subordinate formations, for the next and subsequent stages of the operation.<sup>15</sup>

In most other respects, the *Air Operations Manual* replicated the air C2 coverage provided by AP3000, although it supplied considerably more detail. The analyse-plan-direct-control process was refined to analyse-plan-implement-assess, but it was the language that changed rather than the process itself. It was now formally linked to Colonel John Boyd's decision-action cycle or 'OODA loop', and the manual stressed that 'the commander must complete his control cycle ... more quickly than his enemy, otherwise his plans will be overtaken by enemy action and he will be restricted to reactive decisions.'<sup>16</sup> Within the analysis and planning phases, the manual incorporated the so-called Air Estimate principle.<sup>17</sup>

At the turn of the century, the new editions of AP3000 and the *Air Operations Manual* acknowledged policy initiatives that emerged from the 1998 Strategic Defence Review (SDR), the experience of continuous air operations over Iraq and the former Yugoslavia, and significant changes in UK command arrangements, notably the creation of the Permanent Joint Headquarters (PJHQ) in 1996 and the establishment of the JFACHQ at Headquarters Strike Command (HQSTC). They also incorporated changes in terminology, such as use of the term JTFC – Joint Task Force Commander – rather than JFC.

There was now clearer delineation between the responsibilities of the MOD and those of the operational commander. AP3000 recorded that although the MOD retained its role as both a department of state and a military headquarters, its responsibilities were confined to 'formulating policy and guidance and providing military advice to ministers and commanders'.<sup>18</sup> Within this construct, the Chief of the Defence Staff (CDS) was to issue a planning directive to the Joint Commander and collaborate with him to produce a strategic estimate and recommend a military strategy; he would then issue the Joint Commander with an operational directive specifying the overall campaign strategy and military objectives, detailing the allotment of resources to achieve the operational directive, and granting the Joint Commander operational command of assigned forces. The Joint Commander would then be responsible for deploying, sustaining and recovering the force. It was also recorded that while UK forces deployed on purely national operations would still come under a JTFC, command in theatre

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14. MAAP – Master Air Attack Plan.

15. *Air Operations Manual* (1996), p. 11.I.2.

16. *Air Operations Manual* (1996), p. 3.I.2.

17. *Air Operations Manual* (1996), pp. 11.II.1-7.

18. AP3000 (3rd edition, 1999), p. 1.3.2.

would be exercised by a National Contingent Commander in multinational operations led by another nation.<sup>19</sup>

A new subject for UK air C2 doctrine was the principle of Mission Command, described by AP3000 as ‘the philosophy in which commanders tell their subordinates what to achieve and why, rather than what to do and how’.

At all levels, mission command is articulated through a statement of the commander’s guidance and intent, together with the articulation of his subordinates’ missions in the context of the overall plan ... The JFACC can exercise mission command by offering guidance, intent and effect sought to the next level to avoid ‘reachdown’ and mission prescription.<sup>20</sup>

This could involve a cascade process characterised by the repeated delegation of mission command to lower-level commanders.

Both publications assumed an orthodox position on the basic principles of centralised command and decentralised execution, although AP3000 accepted that the JFACC might wish to delegate a measure of control to lower levels ‘depending on the context’ and for ‘certain missions’.<sup>21</sup> Likewise, they both embraced the component command concept. However, AP3000 noted the potential need to create *ad hoc* command arrangements in coalition operations. ‘As a general rule, particularly for air power, complex command and control arrangements should be avoided.’<sup>22</sup> On the supported and supporting relationship, the importance of close collaboration was reiterated.

The commander of the supported force will indicate in detail to the supporting commander the support missions he wishes to have fulfilled, taking account of the normal operational procedures of the supporting force. He will provide the information needed for complete coordination of the supporting action with the action of his own force.<sup>23</sup>

Process was refined once more to reflect evolving terminology within command organisations, but there were no changes of great substance. Six phases were listed in the *Air Operations Manual*:

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19. *Air Operations Manual* (Air Warfare Centre, 2nd edition, 2000), p. 3.I.2.

20. AP3000 (3rd edition), p. 1.3.4.

21. AP3000 (3rd edition), p. 1.3.5.

22. AP3000 (3rd edition), p. 1.3.3.

23. *Air Operations Manual* (2nd edition), pp. 3.I.4-3.I.5.

- 1) Guidance
- 2) Air Estimate (Analysis)
- 3) Planning
- 4) Tasking
- 5) Execution
- 6) Combat Assessment, potentially leading to revised guidance<sup>24</sup>

Again, the speed of the decision/action cycle was deemed all-important, and the need for prioritisation was another recurring theme. The JTCCB remained central to the provision of guidance and prioritisation from the JTFC's level, playing 'a crucial role in overall campaign coordination'.<sup>25</sup>

Between them, AP3000 and the *Air Operations Manual* successfully re-established a doctrinal basis for RAF operational activity during the 1990s, including air C2. However, developments in the following years soon necessitated revision. Increasingly, it was recognised that rapid advances in communications and information technology were causing some commanders to attempt both centralised control and centralised execution, with potentially detrimental consequences. Later publications therefore stressed that, while there were occasions when centralised execution might be of some utility, 'this should not become the norm'.

No single person can achieve and maintain the detailed level of situational awareness that is required in a dynamic combat environment involving multiple simultaneous engagements throughout the JOA.<sup>26</sup> Too much centralised execution results in a rigid campaign unresponsive to local conditions and lacking in tactical flexibility.<sup>27</sup>

Furthermore, while both publications were overwhelmingly framed to address conventional warfare scenarios and pre-planned air operations, the first decade of the new century witnessed a pronounced shift towards dynamic tasking – particularly Close Air Support (CAS) – in operations against both conventional and irregular adversaries. Air-Land Integration (ALI) was the subject of much discussion in both RAF and Army circles, although it was rarely defined with much clarity.

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24. *Air Operations Manual* (2nd edition), pp. 3.IV.2-3.

25. AP3000 (3rd edition), p. 1.3.7.

26. JOA – Joint Operational Area.

27. AP3002, *Air Warfare* (Air Warfare Centre, 2006), Section 1, p. 32.

This was reflected in the first edition of AP3002. Whereas the Air Operations Manual barely considered CAS, AP3002 assigned twelve pages to the subject and provided further coverage of ‘Counter-Land C2’, much of which was directly relevant to the provision of CAS. Where C2 was concerned, it considered the role of the Battlefield Coordination Detachment, which was the senior Land Component liaison element in the CAOC, the Air Component Coordination Element, the equivalent Air Component liaison unit at the Combined Joint Task Force (CJTF) headquarters or Combined Forces Land Component Commander (CFLCC) level, airborne C2, the Air Support Operations Centre (ASOC), which controlled CAS and other air operations in support of particular ground formations, and the US Marine Corps’ equivalent organisation, the Direct Air Support Centre (DASC). Ground and air forward air control measures were also described, together with CAS techniques, tactics and procedures.<sup>28</sup>

Complex as this nomenclature might have sounded, the broad principle was simple enough. In accordance with the CJTF commander’s guidance, the Combined Forces Air Component Commander (CFACC) would assign a proportion of his air assets to CAS via the ATO. Aircraft would then be sent to a particular area to work with an ASOC, which would pass them to a Forward Air Controller (FAC) if a forward ground unit required CAS. However, this did imply that certain functions performed at CAOC level in pre-planned operations were delegated to lower-level control centres or airborne C2 assets, FACs and even the cockpit in CAS. To that extent, CAS involved no reduction of centralised command but some decentralisation of control and not merely execution. The authors of AP3002 were apparently unwilling to acknowledge this inescapable truth.

Furthermore, the emphasis on CAS generated a gulf between the CAOC and the missions that the CFACC’s aircraft were supporting, except in the broadest operational sense. The Air Component’s role was concerned less with military objectives than the provision of a given level of support to the Land Component. Similarly, from the Land perspective, the importance of integrating airmen into the operational planning process became more difficult to grasp. All that seemed to matter was the availability of CAS or other forms of air support on call. These trends, evident in the Iraqi theatre from 2003 onwards, became more pronounced during the subsequent Afghan conflict but were not directly addressed by AP3002.

By the time that a second edition of AP3002 appeared, both issues were somewhat more familiar, and there was at least a readiness to concede that ‘the decentralised control and decentralised execution of air assets may be allocated to specific subordinate commanders for finite periods to improve responsiveness and assurance.’ Nominated ground and air units could also be integrated as task-organised teams for certain operations. However, at other times, centralised

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28. AP3002 (2006), Chapter 2, Section 3.

control would be more suitable. 'The challenge is to determine when decentralised control and execution is appropriate.' The delegation of planning, control and execution functions to an ASOC in operations involving land forces was also acknowledged.<sup>29</sup> At the same time, in addressing the planning process, the second edition insisted that 'early and frequent communication between all interested parties is the key to a coherent and workable plan and ensures that air and space power is fully considered and integrated from the start.'<sup>30</sup> This required suitably qualified and experienced air representation at key planning meetings. Effective inter-component liaison was also considered to be 'a key factor in the success of joint operations'.<sup>31</sup>

Such judgements were both influenced by and applicable to the experience of COIN operations in Iraq and Afghanistan and yet, even in 2009, AP3002 remained largely focused on conventional air operations and deliberate tasking scenarios, and rarely mentioned irregular warfare. At the time, the AWC was working on the production of a classified COIN study blending lessons and doctrine, but it was never completed.<sup>32</sup> Updated NATO air doctrine published in 2009 meanwhile addressed C2 in terms that were entirely orthodox and made no concessions whatsoever to accommodate experience gained during the Afghan counterinsurgency.<sup>33</sup>

In the end, the AWC produced a *Counterinsurgency Primer*, which reiterated the importance of effective and responsive C2. It also insisted on the need for all components to coordinate their activities with air planners at every level to maximise the effectiveness of air support, promoting NEC as a means to achieve information dominance, improved situational awareness, increased tempo, closer air-land partnerships and improved response times.<sup>34</sup> However, the *Counterinsurgency Primer* offered little more than a repetition of the C2 principles published in AP3002, with their limited provision for decentralised control. It was the fourth edition of AP3000 that raised more direct questions about the underlying principles of air C2 in the context of irregular warfare, and which deserves to be quoted verbatim.

With limited numbers of capable aircraft in high demand, the need to deliver assurance and timeliness of air support to the Land Component must be balanced against the requirement to retain the flexibility to concentrate air power where it will be most effective, or where it is most needed ... The challenge for airmen is to

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29. AP3002, *Air Warfare* (Air Warfare Centre, 2nd edition, 2009), Chapter 1, p. 6.

30. AP3002 (2009), Chapter 2, p. 4.

31. AP3002 (2009), Chapter 5, p. 2.

32. An unfinished draft of this document is held by AHB.

33. AJP 3.3(A), *Allied Joint Doctrine for Air and Space Operations* (NATO, 2009), Chapter 1, p. 4.

34. *Counterinsurgency Primer* (Air Warfare Centre, 2009), pp. 33-34.

determine how the flexibility and economy of force provided by the philosophy of centralised command and decentralised execution can be successfully employed in irregular warfare, where the Land Component is primarily applying decentralised planning and execution, requiring air power to respond rapidly to situations not of its own making. This requires acknowledgement that, in some circumstances, centrally controlled air power may be allocated to specific ground operations for finite periods, to improve responsiveness and assurance ... However, there will be other periods when centralised command is more appropriate. The earlier that the Land Component's requirements are integrated into the air planning process, the more likely it is that the right balance – and therefore the desired levels of assurance – can be achieved between centralised and decentralised control and execution.<sup>35</sup>

Subsequently, the AP lent its support to the ATO process as the best means to coordinate competing requirements and orchestrate both aircraft and airspace. Although, to some, it appeared 'too rigid and bureaucratic for irregular warfare in anything other than deliberate operations', it was actually 'surprisingly flexible' if it was properly understood, and joint planning had been conducted from the outset.<sup>36</sup>

AP3000 then introduced the concept of 'adaptive' air command. Via NEC, the JFACC could, it was suggested, delegate and employ mission command with greater confidence.

The JFACC will retain responsibility for ensuring that his subordinates are aware, and comply with, his intent and priorities. However, he may delegate either functional or regional responsibilities to responsible commanders, who in turn may empower other subordinates in the lower tiers of command, as either desired effects, or the plans of other components, demand ... Increasing degrees of NEC permit mission command to be extended, with confidence, down through the tiers of command ... This construct allows air power to shape operations at the strategic and operational levels in irregular warfare, rather than being used as a centrally allocated, but purely tactical response, in the form of airborne surveillance and aerial artillery.<sup>37</sup>

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35. AP3000, *British Air and Space Power Doctrine* (4th edition, 2009), pp. 63-64.

36. AP3000 (4th edition), p. 64.

37. AP3000 (4th edition), pp. 65-66.

‘Adaptive’ air command and control was afterwards incorporated into Joint Doctrine Paper (JDP) 0-30, *UK Air and Space Doctrine*, which replaced AP3000 in 2013, but the AWC proved less inclined to embrace the concept in the third edition of AP3002 three years later, nor does it feature in equivalent NATO and USAF doctrinal publications.<sup>38</sup> Predictably, perhaps, the Development, Concepts and Doctrine Centre elected to abandon adaptive air C2 in the second edition of JDP 0-30 along with any consideration of air power’s role in COIN,<sup>39</sup> but Joint Concept Note 2/17, *Future of Command and Control*, offers ‘agile’ C2 as an alternative. It suggests that ‘We cannot follow a single inflexible approach and expect success. Command and control should be viewed as a system that has a number of parameters, which will need to be purposefully altered for each given approach.’<sup>40</sup>

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38. Joint Doctrine Paper 0-30, *UK Air and Space Doctrine* (Development, Concepts and Doctrine Centre, 2013), Section 3, pp. 30-32. Note, however, that the USAF produced Air Force Doctrine Document 2-3, *Irregular Warfare*, in August 2007, which accepted that ‘In some cases, the COMAFFOR/JFACC may delegate some aspects of planning and decision-making to subordinate Airmen positioned at lower levels within the theater air control system (TACS).’

39. Joint Doctrine Paper 0-30, *UK Air and Space Doctrine* (Development, Concepts and Doctrine Centre, 2017), Section 3.23-3.24, pp. 41-43.

40. Joint Concept Note 2/17, *Future of Command and Control* (Development, Concepts and Doctrine Centre, 2017), Section 3.1, p. 23.

## **OPERATION CORPORATE: THE FALKLANDS WAR, 1982<sup>41</sup>**

On 2 April 1982, Argentine forces occupied the British possessions of the Falkland Islands and South Georgia in pursuit of a long-held but disputed territorial claim. Within a week, under the operation name Corporate, the UK dispatched a Joint Task Force (TF) to retake the islands if no diplomatic solution to the crisis could be found. The RAF played a significant supporting role. British troops ultimately landed at San Carlos on East Falkland on 21 May, and the island capital, Port Stanley, was retaken on 14 June, bringing the conflict to an end. Nevertheless, exceptional challenges were involved in conducting joint operations some 8,000 miles from the UK against numerically superior forces operating far closer to their home bases. Of critical importance to the TF was Ascension Island, approximately halfway between the UK and the Falklands. A British possession, it had an American-operated airfield, Wideawake, which was substantially enlarged for both naval and air operations. It rapidly became a main base, staging post, maintenance unit and supply depot rolled into one.

For the RAF, Operation Corporate will always be associated with the development of air-to-air refuelling and the so-called Black Buck raids on Port Stanley airfield. With vast distances to be covered between the UK and the South Atlantic, AAR played a critical role, and the necessary capabilities were extended to every type of aircraft committed. For more than 2,500 flying hours, RAF Victors completed some 600 fuel transfers during the operation, but their capacity was stretched to the limit, and it was ultimately necessary to modify C-130s and Vulcans to augment the tanker fleet. The Victors were also adapted to conduct photographic reconnaissance and maritime radar reconnaissance. Black Buck operations involved five night attacks by Vulcan bombers targeting the runway at Port Stanley airfield and the airfield radars. Taking up to 16 hours, each mission entailed an 8,000-mile round trip from Ascension and AAR support from 13 tankers; at the time, these were the longest bombing missions in history.

Beyond Black Buck, UK combat air power was supplied by Royal Navy Sea Harriers and the RAF's Harrier GR3s. The Sea Harriers inflicted heavy losses on the Argentine Air Force, but it was impossible to provide the TF with absolute protection: six ships and a landing craft were sunk, and a number of other Royal Navy vessels sustained damage. The loss of the merchant ship *Atlantic Conveyor* on 25 May led to the wholesale revision of British landing plans due to the destruction of her cargo of Royal Navy Wessex helicopters and all but one of the RAF Chinooks on board. The RAF GR3s were at first used to reinforce the Sea Harriers on the TF's two aircraft carriers, even though the RAF Harrier force was unaccustomed to carrier-borne or air defence operations in 1982. Subsequently, they were transferred to their normal offensive support role during the British

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41. Unless otherwise stated, this chapter is based on the unpublished AHB narrative *The Falklands Conflict 1982*.

landings and the advance to Port Stanley, carrier operations being supplemented by sorties from a Forward Operating Base (FOB) at San Carlos established during the first week of June. Three GR3s were lost, all to ground fire.

The other notable roles executed by RAF aircraft during Corporate were maritime air reconnaissance and air transport. Nimrod MR1s and 2s were the first RAF assets to be deployed operationally and provided almost constant maritime surveillance above and below water, supporting the TF throughout its voyage towards the Falklands. Subsequently, AAR extended their coverage to the entire South Atlantic, allowing 19-hour missions to be flown and providing reach as far as the Argentine coast. The Nimrod presence significantly enhanced the situational awareness of British commanders in the area of operations, repeatedly confirming the absence of Argentine naval activity and so preventing the diversion of resources to guard against non-existent threats. To this extent, they functioned as force multipliers – particularly during the landings at San Carlos. Their very presence may also have deterred Argentine naval intervention. Additionally, they patrolled the seas around Ascension and provided communications support for submarines and search-and-rescue capabilities for aircraft flying south, and specially fitted Nimrods were used to collect Signals Intelligence (SIGINT) until the end of May.

Meanwhile, backed by a variety of civil charter aircraft, the RAF air transport force established a continuous resupply of men and equipment to Ascension Island in the largest operation of its kind since the Berlin Airlift. From Ascension, using AAR, C-130s also dropped supplies to TF ships *en route* to the Falklands and positioned in the area during the amphibious landings, the later long-range missions covering 8,000 miles non-stop and taking an average of 25 hours. Beyond carrying passengers and freight, the VC10s flew aeromedical sorties to the UK either from Ascension or Uruguay under International Red Cross arrangements. On the ground, the RAF Regiment provided base defence units and Rapier air defence missiles, and the Tactical Communications Wing assisted with the provision of forward communications for the TF and UK forces at Ascension. Within the logistical chain, the contribution of supply units such as the Tactical Supply Wing and the UK Mobile Air Movements Squadron was equally important.

## **Air C2: The Background**

The story of air C2 in Operation Corporate is essentially one of improvisation. When Argentine forces landed in the Falklands, there were no contingency plans for military countermeasures. The possibility of mounting offensive air operations in the South Atlantic had never been envisaged, so it is hardly surprising that the RAF had not considered the associated problem of command and control either. Moreover, while the TF was rapidly constituted and sent south, few of the roles that the RAF would play in its support were immediately

apparent. At first, therefore, the air C2 arrangements were largely confined to maritime air reconnaissance; they had to be adapted over time to meet the requirements of broader air operations, and this proved extremely difficult.

The RAF command structure in early 1982 was geared in the main to its NATO commitments, with the United Kingdom Regional Air Operations Centre (UKRAOC) at HQSTC in the primary position. In the event of war in the NATO area, the C-in-C STC, in his capacity as CINCUKAIR (the NATO term for the UK Air Commander), would have exercised command and control over most RAF operational aircraft based in the UK through the UKRAOC, answering directly to the Supreme Allied Commander Europe (SACEUR). Aircraft based forward in RAF Germany were part of 2 ATAF within a command chain leading up to SACEUR through Allied Forces Central Europe.

However, Corporate was not a NATO operation but a national OOA operation. In April 1981, the government had announced:

Improvements are being made in command and control arrangements for overseas operations; an existing two-star headquarters will be nominated and staff earmarked to take command of any contingency intervention. This headquarters will be in close contact with all formations that might be called on for such operations.<sup>42</sup>

Yet this plan had not progressed very far by the following year. Consequently, when Argentina invaded the Falklands, the UK did not possess a permanent joint or joint force headquarters, nor were there cadre-based headquarters provisions that could be enlarged in time of emergency. Furthermore, the MOD proved unwilling to delegate operational command of Corporate to an existing UK headquarters, preferring instead to assume a direct command role itself through the medium of the Chiefs of Staff. Beneath the Chiefs of Staff, the role of Task Force Headquarters was assigned to CINCFLEET's headquarters at Northwood, CINCFLEET himself becoming Commander Task Force (CTF). This was entirely logical given the Royal Navy's central role in the operation, but it was extremely ambitious to locate the Task Force Headquarters some 8,000 miles from the Falkland Islands. No subordinate headquarters facility was established either at Ascension or with the TF itself to co-ordinate the actions of the force elements in theatre.

The chain of command therefore ran from the MOD to Northwood and then on to the various Task Groups. Within this structure, the post of Air Commander was assigned to the Air Officer Commanding (AOC) 18 Group, the RAF group responsible for Nimrod Maritime Patrol Aircraft (MPA) squadrons.

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42. Cmnd. 8212-I, *Statement on the Defence Estimates 1981* (HMSO, London, 1981), p. 32, para 416.

As these were, at first, the only RAF aircraft directly committed to the TF's support, there were strong arguments in favour of this arrangement. The AOC and his staff were fully accustomed to working with their Royal Navy colleagues, and it made good sense for his headquarters to direct RAF operations in their support. However, whereas the AOC 18 Group was normally answerable to the C-in-C STC and only indirectly responsible to the MOD, during Corporate he would work directly up to the Assistant Chief of Air Staff (Operations) (ACAS (Ops)). Thus, although the C-in-C STC was always kept informed about developments at the TF headquarters, he was left in a very uncertain position.

## **Ministry of Defence**

The Falklands crisis erupted when CDS was out of the country, and the principal measures to establish the TF were therefore taken by the Chief of the Naval Staff (CNS) and Commander-in-Chief Fleet (CINCFLEET) (consulting as necessary with the Secretary of State); Corporate was primarily viewed as a naval operation for which assistance from the other services could be enlisted by normal staff action. The Chief of the Air Staff (CAS), functioning as Acting CDS, was present when most key decisions were taken, and he instituted daily Chiefs of Staff meetings (which continued throughout the crisis) to keep all three service chiefs fully up to date on the latest developments. Above the COS and the Secretary of State for Defence was a ministerial sub-committee known as the Defence and Overseas Policy Committee Sub-Committee on the South Atlantic and Falkland Islands (OD (SA)). Established on 6 April, this included the Home, Defence and Foreign Secretaries and the Paymaster General, with one or more of the Chiefs of Staff attending as necessary.

While Corporate was a joint operation, both the task and the C2 chain determined that the Royal Navy invariably exercised a pivotal influence on decision making. Quite apart from the fact that CINCFLEET was appointed CTF and commanded the TF from Northwood, working directly down to the naval Task Groups and up to the First Sea Lord and his staff in the MOD, the CDS in 1982 was Admiral Sir Terence Lewin and the Vice Chief of the Defence Staff (Operations) (VCDS (Ops)) was Rear Admiral David Brown. Some officers in this chain and at lower levels understood that the RAF could make a significant contribution to Corporate, but others did not, and air power was employed throughout within an operational planning framework that was overwhelmingly dark blue in complexion. In theatre, the TF battle group, Task Group 317.8, was commanded by a submariner, Admiral Woodward. Although he exercised command from the carrier HMS Hermes, he had little professional knowledge of air power. The result was a degree of inter-service friction extending from the inevitable differences of opinion and perspective through to misunderstandings and, on occasion, outright obstruction.

For example, for the Black Buck raids, the MOD fulfilled the operational command role effectively enough. Key issues such as aircraft capability, AAR requirements, the threat from enemy air defences and the avoidance of civilian casualties were dealt with from the Air Staff level, albeit sometimes via unorthodox C2 channels. However, where the rationale for the operation was concerned, the Air Staff's primary argument for using the Vulcans rested on calculations of effect. As CAS put it on 19 April,

We could let it be known that we had a force of Vulcans on Ascension with the range to carry out attacks as far as the Argentine mainland posing a threat to their airfields and naval units in port ... The Argentines would be aware of all these possibilities from published data on the Vulcan. Positioning some Vulcans at Ascension could also force the Argentines to maintain or deploy some of their fighters to the northern part of Argentina where they could not pose a threat to our TF in the area of the Falklands.

It was on these grounds and in the expectation of broader strategic effect that the War Cabinet approved the Black Buck concept on 21 April. To that extent, the purely tactical aspects of Black Buck were of secondary importance. An attack on virtually any Argentine military target in the Falklands would have sufficed.

Nevertheless, it was necessary to identify a target that a Vulcan could realistically hit with unguided weapons; such a target had to be fixed and relatively large. The Port Stanley runway satisfied both these criteria but its use as a target for a single long-range Vulcan attack with the support of at least twelve tankers was then confused with the very different problem of closing the runway and keeping it closed. Not only would this involve multiple attacks over time; it would also require the regular collection of imagery for Battle-Damage Assessment (BDA) purposes. When this became clear, there were protracted arguments that touched on the requirement for Black Buck, the apparently far simpler concept of using Sea Harriers to close the runway, and subsequent air reconnaissance.

It was in this context that Admiral Woodward produced a very different rationale for Black Buck. Woodward was keen to launch an air attack on Port Stanley before his carriers entered the Falkland Islands Total Exclusion Zone (TEZ), and he also feared that his small force of Sea Harriers might prove vulnerable to Argentine air defences during low-level attacks on the airfield. On 28 April, he signalled Northwood:

My main requirement is for a Vulcan attack in advance of Battle Group arrival in the TEZ ... This would allow me to close the Falklands for follow-on offensive air operations and to sustain

local air control. More importantly, it cuts Sea Harrier attrition to a minimum and ... I need all I can get for their primary AD<sup>43</sup> role. Tasking the Sea Harriers in advance of the Vulcans for fire suppression obviously puts them at risk.

Furthermore, he was strongly opposed to the use of his Sea Harriers for BDA collection because of the risks involved.<sup>44</sup>

Subsequent events fully substantiated the validity of CAS's arguments. The first Black Buck raid exerted considerable strategic effect, causing at least part of the Argentine Mirage fighter force to be moved north – beyond range of the Falklands – to protect Buenos Aires, even though the UK never developed detailed plans for attacking the Argentine mainland. However, any prospect of more systematic action to close the airfield was effectively ruled out by the lack of air imagery. The MOD repeatedly requested photographs from the TF, but neither Woodward nor his staff possessed a clear understanding of the importance of BDA subsequent to Vulcan attacks, attacks by Sea Harriers or naval bombardment.<sup>45</sup> Between Black Buck 1 (30 April to 1 May) and 18 May (the day after the first Harrier GR3s landed on HMS Hermes), TF situation reports made no mention of low-level air reconnaissance and the Air Commander complained to VCAS that day that:

On those occasions that photographic evidence is gained, the reports are vague, incomplete and bear no resemblance to correct Recce and Misrep format; disappointing as there is an RAF Photo Interpreter with the Force.

VCAS replied that CAS had raised this topic on several occasions, the most recent being at the COS meeting on 17 May, but there was no improvement throughout the campaign.

With CAS closely involved in higher decision-making through his membership of the COS committee and, on occasion, as Acting CDS, the detailed work of the Air Staff was the responsibility of ACAS (Ops). Shortly before the Argentine invasion, he met his Royal Navy and Army opposite numbers to exchange ideas; he also reinforced the 24-hour manning of the Air Staff's Air Force Operations Room. To operate a three-shift system, a third Air Commodore occasionally joined the two already on his staff, and several specialists were brought in to cover some of the support roles. Nevertheless, the Operations Room was largely run by existing members of his division, all of whom had still to manage their own offices – even if much of their normal work was at this stage

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43. AD – Air Defence.

44. Sir Lawrence Freedman, *The Official history of the Falklands Campaign Vol. 2: War and Diplomacy* (Routledge, Oxford, 2005), pp. 277-279.

45. Freedman, *The Falklands Campaign, Vol II* (Routledge, London, 2005), pp. 277-278.

related to Corporate. ACAS (Ops) did not work shifts himself; as the officer responsible for virtually all the key decisions taken in a constantly changing situation, he simply worked all the hours he could.

Nearby, in MOD Main Building, ACAS (Ops) had easy access to the Central Staffs and his Navy and Army counterparts, and they appear to have collaborated very effectively. There was also close co-operation with the secretariat branches. Much of the work of the Operations Room was concerned with procurement and planning, normally the preserves of ACAS Operational Requirements and ACAS Policy, neither of whom were closely involved in Corporate. On operational grounds, it was essential to simplify procurement procedures, and many of the normal financial restraints were eased. The revised procedures worked in practice, but the need to purchase new equipment and incorporate modifications into aircraft at very short notice presented engineering staffs with a considerable challenge and periodically generated confusion at lower levels. While it was widely considered that central control should have been tighter, the real problem was perhaps that control was centralised to an unrealistic degree and at very short notice.

Given their role in the operational command chain, another serious difficulty for ACAS (Ops) and the other staffs involved in Corporate was the initial lack of intelligence on Argentine forces and the broader situation in the South Atlantic. Despite friction over the Falklands between the UK and Argentina during the 1970s, the Defence Intelligence Staff (DIS) had faced cuts in personnel and other economies over the years, and the resulting need to prioritise had inevitably resulted in a focus on the NATO area. The DIS had devoted minimal effort to Argentina as an intelligence target and there was virtually no data-bank of information; even the most basic 'staff officers' handbook' material was lacking, not to mention details of Argentina's most recent arms acquisitions.

Reinforced by 85 augmentees, the DIS at first expended considerable effort on assembling and collating raw data; little more could be done until this process was under way. Yet there were naturally many urgent demands for assessments and analysis as soon as the crisis erupted. The initial DIS response was an examination of Argentine capabilities produced on 7 April, but it contained several errors and misleading statements. Further papers on the same subject produced on the 14th and 15th were little better, seriously underestimating the likely effectiveness of Argentine air attacks on shipping. A more accurate analysis of Argentine air power appeared on 7 May, but certain air defence, air reconnaissance and attack capabilities were still underestimated. A much-enlarged collection effort drawing heavily on GCHQ sources only started to bear fruit in the following week, when the DIS produced far more accurate reports on Argentine military deployments and the Argentine garrison on the Falklands.

Even then, little intelligence was available on military activity in mainland Argentina, and many assessments and briefings reflected a marked degree of uncertainty about the dispositions of the Argentine air force and the movement of

key elements of the fleet, such as submarines and the single aircraft carrier. As early as 2 April, the air and Exocet missile threats were identified in a COS briefing by the Deputy Chief of the Defence Staff (DCDS) as ‘the biggest worry’, but the Argentine air order of battle could never be assessed with confidence. Similarly, in the absence of intelligence from the mainland, there was little information about basing and the subsequent redeployment of Argentine aircraft. However, UK intelligence assessments of Argentine strategic and tactical options and likely courses of action were perceptive and accurate throughout the campaign, and threat warnings were also both reliable and timely. Thus, although the intelligence picture was seriously flawed during the early stages of Operation Corporate, a pronounced improvement had taken place by the time the TF reached the Falklands.

Security was a subject of constant concern. Few of those working in the MOD or the other C2 nodes had previously experienced an actual war situation and the risks involved in planning and mounting ‘live’ military operations, and ACAS (Ops) therefore decided to impose stringent rules in applying the ‘need to know’ principle. In some quarters, it was felt that he was too secretive. For example, there were occasions when key support staff found themselves excluded on security grounds from high-priority tasks, such as the Black Buck work-up at RAF Waddington. There were dangers, too, in the signals distribution system. In an operation critically dependent on signalling, it could be difficult to restrict observation of more sensitive communications to their intended recipients even when they were marked ‘exclusive for’. Similar difficulties could also occur during the transmission process.

The focal position of ACAS (Ops) meant that he and the Operations Room were in constant touch with lower formations throughout the RAF. The need to act quickly often entailed direct communication with the various RAF Group headquarters and, at times, with staff at lower levels, which gave rise to periodic complaints that responsible commanders or their headquarters were being bypassed. For example, on 19 April, the AOC 38 Group expressed concern at the amount of direct contact apparently occurring between higher headquarters and station commanders, especially during planning for the use of Harriers<sup>46</sup> and support helicopters. In his view, this caused uncertainty if not confusion. While he appreciated the need for flexibility, he sought assurances that all questions concerning the use of 38 Group assets would be directed to his headquarters.

Wing Commander Squire, the Officer Commanding 1 Squadron (and future Chief of the Air Staff, Air Chief Marshal Sir Peter Squire), likewise recorded that disjointed C2 arrangements were the cause of considerable frustration. While preparing for deployment, he was receiving ample information straight from the MOD and 18 Group but little from HQSTC or 38 Group;

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46. In 1982, 1 Squadron, the RAF Harrier squadron that deployed to the Falklands, came under 38 Group.

although they were his superior formations, they had, of course, been excluded from the Corporate command chain. Seeking to obtain details of how his aircraft were to be loaded on board ship, he found that his best source of up-to-date information was the Royal Navy. There were also occasions when trials work ordered directly on stations by the MOD involved the allocation of aircraft that were being used for other urgent training or operational purposes. An information link was established between ACAS (Ops) and the Senior Air Staff Officer at HQSTC and was correctly observed on most occasions, but it could not provide a solution to the many and varied problems generated by STC's separation from formal Corporate C2 channels.

### **HQ 18 Group, Northwood**

Once the decision had been taken to place the TF under the command of CINCFLEET at Northwood, it was virtually inevitable that the role of Air Commander would be assigned to the AOC 18 Group, Air Marshal Sir John Curtiss. Their respective headquarters were co-located, they were accustomed to working together in their normal NATO roles, and they were good friends. Indeed, CINCFLEET wanted Curtiss and was already treating him as his air deputy before his appointment as Air Commander was formally announced on 12 April. His directive from CAS made him responsible to CINCFLEET for operational command and control of all aircraft, air operations, equipment and personnel of the RAF placed under his authority by C-in-C STC for Corporate. In this capacity, he was allowed to liaise directly with the Air Force Department at the MOD and with other Royal Navy, Army and RAF commanders, while keeping MOD (Air) and the C-in-C STC fully informed. The only area to which his authority did not extend was air transport, which remained the responsibility of the AOC 38 Group. However, C-130s supporting the Special Forces (SF) were placed under his control once they reached Ascension, and on 5 May he was also assigned Operational Control (OPCON) of aircraft dropping supplies to the TF between Ascension and the Falklands.

It was fortunate that Curtiss possessed considerable operational experience in a wide variety of air power roles extending far beyond the maritime environment.<sup>47</sup> Moreover, as a full Air Marshal, he was senior to the other RAF

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47. Trained as a navigator, Curtiss served first with Bomber Command on Halifax bombers in the later stages of the Second World War and then on Stirlings and Yorks in the transport role, including the Berlin Airlift. After a period in Fighter Control, he served with 29 (Meteor night fighters) and 5 Squadron (Javelins), and then became Wing Commander Operations at Wittering, a Victor medium bomber station. He then became Station Commander at RAF Bruggen, a strike/attack Phantom base, spent some time at HQSTC as Group Captain Operations, and served as SASO at 11 Group, before moving on to the RAF Staff College at Bracknell, where he ultimately became Commandant. He also served at the MOD as Director General of Organisation.

group commanders, including those required to place resources at his disposal. On the other hand, his permanent staff was small, and their expertise was substantially limited to maritime air reconnaissance. In the early stages, they had to cope as best they could while further roles were added, but considerable difficulties were caused by the separation of the controlling authority at Northwood, responsible for operational planning, from those involved in preparing and training committed forces. This was particularly true when aircraft were used in unfamiliar roles. For example, since their staff were not involved in preparing aircraft or aircrew, 18 Group Headquarters did not fully appreciate the limitations of the Victors and their crews in their new photographic reconnaissance and maritime radar reconnaissance roles or of the Vulcans in medium-level conventional bombing.

The need for a broader range of subject matter experts was soon appreciated, and suitable reinforcements were assembled as quickly as possible. Nevertheless, the AOC's Chief of Staff (COS) felt that they struggled on their own for too long and that corrective action should have been taken earlier. A further problem was a shortage of accommodation, as the normal NATO facilities were not available for a purely national, OOA campaign. The Royal Navy operated from the CINCFLEET Operations Room, where all the main briefings were conducted twice per day, but the RAF had to make do with a small conference room converted for operations purposes, which provided only cramped and substandard facilities. The quantity of paper – mainly signals – was overwhelming, and it was very difficult to ensure that nothing important was missed. The situation was further complicated by the fact that the Royal Navy and the RAF employed different distribution systems. After one embarrassing incident, when an important signal failed to reach the Air Commander, an officer was appointed full-time to check everything that came in. With a small staff working under extreme pressure, important decisions were sometimes also taken without the knowledge of the more senior officers. The Air Commander had periodically to remind his subordinates of the importance of consulting him or the COS on key issues that had arisen outside normal working hours.

Once the 18 Group staff had been reinforced by experts from beyond the maritime air community, it was possible to establish a coherent Air Headquarters command structure. Beneath the Air Commander was the COS, who handled many of the more detailed tasks and liaison with the SASO, HQSTC and the various RAF groups, leaving the Air Commander free to devote much of his time to the higher commanders and to act as deputy to the CTF for all joint-service matters. Before April 1982, there had been four group captains on the staff with responsibilities for (1) Operations and Training, (2) Plans and Exercises, (3) Administration and (4) Engineering. However, during Corporate, the pressure on the Operations and Training division was so great that two additional group captains were brought in to provide support and assigned to current operations and future planning, while the officer previously responsible for planning was

reassigned to intelligence. Another group captain became the Senior RAF Officer on Ascension, while SF operations were allocated to a wing commander transferred from the Central Trials and Tactics Organisation cell at Northwood. In the later stages, another wing commander became the RAF representative with 5 Brigade – within the TF itself.

The normal daily routine consisted of a main briefing at 0840 in the Fleet Operations Room, followed by a meeting between the Air Commander, the COS and the group captains, after which the Air Commander would attend the Flag, Air and General Officers' Meeting. A further main briefing would take place at 1700. Inevitably, many key decisions were taken either in conference or by telephone and, while the majority were logged, some went unrecorded. Periodically, therefore, the Air Commander would circulate a signal spelling out his intentions to all concerned.

### **RAF Representation within the Task Force**

While the Air Commander was the senior air adviser to the CTF and thus represented the RAF and the air perspective at Northwood, he was not assigned a senior subordinate with the TF itself. Admiral Woodward had therefore to depend for local air advice at senior level entirely on the captains of the aircraft carriers *Hermes* and *Invincible*, and on their Commodores (Air). This was chiefly because the RAF's role in Corporate was far from clear during the early planning stages. The provision of air support to the landing force was not seriously envisaged by the Royal Navy or the RAF until early May. Although the CTF suggested on 27 April that Sea Harriers might have to conduct air reconnaissance and provide offensive air support during the landings, their primary task was always viewed as air defence. Heavily outnumbered by the Argentine Air Force, they were expected to incur significant losses, and the RAF Harriers sent out to the South Atlantic were therefore intended to serve as replacements in the same role. As abundant air defence expertise was available on the two carriers, there was no obvious call for a senior RAF presence.

However, by the beginning of May, amphibious landings were being planned, and the experience of live air combat had meanwhile demonstrated that Harriers equipped with AIM-9L Sidewinder air-to-air missiles were more than a match for their Argentine adversaries. Some of their effort could thus be diverted to offensive air support. At this point, the deployment of an experienced air commodore to the South Atlantic would have ensured that expert advice was readily available to Admiral Woodward at the TF level, and CAS would certainly have favoured the dispatch of such an officer. However, the Royal Navy would never have accepted the presence of even a group captain on board a ship commanded by a captain (i.e., equal in rank), especially when that captain was himself a naval airman. Consequently, among the more senior TF commanders, there was minimal understanding of key air power roles such as air

reconnaissance, maritime air reconnaissance, offensive air support, AAR and air supply. Given the presence of 1 Squadron's Harrier GR3s on board Hermes, her inability to provide effective tactical C2 for offensive air operations and air reconnaissance was particularly unfortunate.

Neither Admiral Woodward's staff nor the Hermes crew were organised to control such operations in support of the British forces that landed on the Falklands. Although it was widely believed that the carrier possessed a Tactical Air Control Centre, no such facility existed. Indeed, only a single officer staffed the ship's air operations room. He was responsible for all air operations, including helicopters, and did not have the capacity to manage tasking and monitor the progress of individual missions. The air intelligence cell was located four decks below the air operations room, was manned by just one corporal and had no ground or air situation maps. The established Carrier-Borne Ground Liaison Officer was reassigned to the Admiral's staff and was not continuously available to participate in air tasking, and there were no targeting or attack planning facilities whatsoever. Even the precise definition of an air support task as opposed to an air support request caused confusion within the Task Group and Hermes staffs for a time.

After planning to recapture the Falklands had been initiated, an RAF joint warfare specialist, Wing Commander Trowern, was appointed to serve as air adviser to General Moore, the land force commander. The intention was to establish a full Harrier FOB on shore as soon as possible to support twelve aircraft with fuel, weapons and standard turn-round facilities, but the reality was more modest. Owing in large part to the loss of metal planking and Harrier spares on board Atlantic Conveyor, the FOB eventually built could cope with only four aircraft at a time and merely provide refuelling.

These limitations prevented the Harriers of 1 Squadron from being based on shore under the command and control of General Moore, as had been hoped. Instead, they remained on Hermes, where all requests for air support had to be sent. Moreover, Admiral Woodward insisted on the captain of Hermes being personally consulted before any GR3 tasking was approved. Another wing commander, Squire, was on board Hermes, but he could hardly have acted as a staff officer at the same time as commanding 1 Squadron. A squadron leader functioning as Harrier Air Liaison Officer joined Woodward's staff when the GR3s arrived, but he found his role difficult to fulfil and was sent ashore to command the FOB after just ten days on board.

In the meantime, Trowern was required to stay alongside General Moore on his command ship, HMS Fearless. As there was no effective air support organisation on board, he found that he was expected to manage air tasking on a 24-hour basis and at the same time advise the general, pay visits to the FOB and survey other possible Harrier FOB sites. Working alone until 11 June and severely hampered by poor communications, he was unable to operate efficiently.

One possible solution might have been the appointment of a third wing commander with the TF; alternatively, Trowern might have been moved to Hermes. Yet it is still doubtful that much improvement would have occurred. In the absence of a more senior officer, the RAF were never likely to exercise much leverage at TF level. The essential fact was that Hermes was committed to Corporate with no effective capacity to provide air C2 for Sea Harriers or GR3s operating in the support of the landing force, and this regrettable situation was not addressed during the operation itself. The landings at San Carlos were planned without air imagery,<sup>48</sup> and the GR3s were regularly dispatched on armed reconnaissance without any prior target intelligence. Moreover, if it was rare even for the simplest combination of reconnaissance and attack capabilities to be coordinated in order to identify and strike key Argentine targets (let alone analyse and exploit the results), it was even less common for such actions to be coordinated with the ground campaign. For example, imagery gathered on 23 May led to an attack on defensive positions in Port Howard on the 26th, the day before the ground assault on Goose Green. Located in West Falkland, the targets in Port Howard bore no relevance whatsoever to the vital ground operations pending in the east.

### **Ascension Island**

The key to most of the operations for which the Air Commander was responsible was Wideawake airfield on Ascension Island. Here, too, air C2 was by no means straightforward. Initially, it seemed that Ascension did not to have a major role to play beyond assisting the assembly of the TF. While the RAF air transport force was certain to be involved, and plans were soon devised to mount Nimrod missions from the island, it was chiefly expected to serve as a logistical staging post for the Royal Navy, and there was no indication that Ascension might become a base for more extensive air operations. Thus, when the first elements sent to the island were placed under the command of Captain R. McQueen, RN, his directive defined the role of Ascension as forward logistics support, primarily for the Royal Navy and later for all three services as operational plans developed. As Commander British Forces Support Unit (CBFSU), McQueen was given command of all British forces stationed on the island to conduct logistic and administrative support roles. He was made answerable to VCDS (Personnel and Logistics – P and L) in the MOD rather than the CTF.

The adverse consequences of this bizarre arrangement became apparent as soon as Ascension's role was enlarged. When the Chiefs of Staff decided to mount far more extensive RAF operations from Wideawake airfield, the Senior RAF Officer (SRAFO) appointment on the island was elevated from wing

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48. Julian Thompson, *No Picnic – 3 Commando Brigade in the South Atlantic: 1982* (Fontana/Collins, Glasgow, 1986), p. 19.

commander to group captain rank. The directive from the CTF to the officer assigned to this post placed him in an impossible position by requiring him to serve two masters. On the basis that a marked increase in the scale of RAF deployments and activity was imminent, he was made responsible to the Air Commander for all RAF aircraft, equipment and personnel and for the conduct of all RAF operations from Ascension other than those of the air transport force. However, at the same time, he was made answerable to the CBFSU (and thus through him to VCDS (P and L) for the administration of those forces.

Meanwhile, Captain McQueen proved far from sympathetic towards some of the RAF's activities. While he fully appreciated the efforts of the air transport force in direct support of the TF, he harboured doubts about the value of the Vulcan and Nimrod operations which, with their associated Victor tankers, made significant demands on the island's limited resources. The SRAFO later recorded that he showed little appreciation of what the RAF were trying to do. Since all administrative and logistic support for operations had to be obtained through Captain McQueen, there were inevitable tensions. Writing afterwards, in October 1982, McQueen was openly critical of the RAF. 'At no stage,' he wrote, 'did economy of effort, either with people or other resources, appear to feature in the light blue staff manual.' He went on to accuse the RAF high command of failing to delegate authority, of dividing control among too many authorities, and of having no clear-cut decision-making machinery. That such charges could be levelled publicly by one service against another so soon after a major operation underlines the unsatisfactory nature of command relations during the actual period of hostilities.

It is important to understand the difficulties of McQueen's position. To organise logistic support for the ships of the TF, he had been sent to an island with desperately few facilities, where the primary RAF role apparently involved the provision of air transport. This task was clearly defined in his original directive, whereas the subsequent expansion of RAF activity was not. While the airmen on the spot did their best to explain to him the importance of their radar reconnaissance, maritime surveillance and long-distance bombing roles, it apparently seemed to him that the effort needed to mount these AAR-supported operations was out of all proportion to the results they were likely to achieve.

Yet such issues could easily have been clarified if McQueen had occupied a position in the Corporate chain of command. He might then have grasped more easily that the extension of RAF activity from Wideawake resulted not from unilateral action by a single service but from decisions taken jointly by the Royal Navy and the RAF at Northwood under the overall direction of the Chiefs of Staff. Similarly, he might have understood that the RAF had been compelled to adopt extreme measures to improvise a series of operations that differed fundamentally from those associated with normal air activity in the NATO area – operations not subject to normal RAF C2 arrangements, which had effectively been bypassed when the Corporate command chain was established.



Air Marshal Sir John Curtiss, the AOC 18 Group and Air Commander during Operation Corporate.



Wideawake airfield, Ascension Island: an RAF VC10, Victor tankers, a Hercules and a Chinook are visible, as well as Royal Navy Sea Harriers.



Vulcans and Victor tankers at Wideawake.



Wing Commander Peter Squire, the OC 1 Squadron, taking off from Atlantic Conveyor for the transit to the carrier, HMS Hermes.



1 Squadron Harrier GR3s on the runway built at Port San Carlos.

By the last week of April, the situation at Ascension was proving so unsatisfactory that the CTF proposed significant changes. As well as revising Wideawake lease arrangements with the Americans, he suggested that the SRAFO should become airfield commander, responsible to the CTF through the Air Commander; Captain McQueen, as CBFSU, could still retain overall command of the island base and remain responsible to VCDS (P and L) for its administration. On 3 May, the Assistant Chief of the Defence Staff (Operations) went even further, pointing out the major changes that had taken place in the roles of the forces deployed to Ascension, stressing its significance as a target for the Argentines, and recommending that the CBFSU be subordinated to the CTF for all purposes. However, no change was actually made until 18 June – after the ceasefire – when command of all British forces on the island was centralised and placed in RAF hands.

In the Air Commander's view, the practical effect of the failure to place Ascension under the CTF was to slow the decision-making process during the critical period when the island was being transformed into a major base for RAF operations. VCDS (P and L) and his staff had little appreciation of the practical problems associated with aircraft parking space, accommodation and increased personnel numbers, nor could they be kept up to date with rapidly changing operational plans. The SRAFO subsequently described the system of providing administrative and logistic support through the MOD as cumbersome and inefficient; it 'complicated the problems of coping with a rapidly developing situation'. The structure and function of different TF elements was not properly appreciated by many higher command echelons in the UK, and the staff on Ascension were therefore bombarded with information demands originating from across the defence community, which overloaded their communications. At the time, it was argued that there should have been a single point of contact at Northwood – a form of clearing house that would have shielded the staff at Ascension from many of these requests for information. However, a commitment of this nature would have imposed a further heavy burden on the Northwood headquarters, where facilities (including communications) were already barely adequate.

### **An Evaluation of Air C2 in Operation Corporate**

With the advantage of hindsight, it is possible to devise an alternative C2 structure for Operation Corporate in which the MOD provided strategic direction and operational guidance and Northwood functioned as a Joint Headquarters (JHQ), supported by each of the FLCs. A Joint Task Force Headquarters might then have been positioned at Ascension or possibly afloat with the TF itself. Either way, Ascension Island could have operated within such a command chain, reporting to the JHQ. Such a system would have provided a clear and direct C2 link extending

from the MOD through the JHQ to the Joint Task Force in theatre, while incorporating the FLCs and Ascension.

The problem with this scenario would have been the absence of the physical infrastructure – particularly Communications and Information Systems (CIS) – necessary to establish the JHQ and Joint Task Force Headquarters. In 1982, the UK had no prepared C2 facilities capable of fulfilling the necessary headquarters functions, and the actual experience of the TF illustrates how difficult it would have been to exercise effective joint C2 from a ship. To that extent, therefore, there was no choice but to adopt alternative C2 solutions. However, these were undoubtedly shaped by the Royal Navy and the supposition in some quarters that Corporate should be approached as a naval operation rather than a joint operation.

Corporate C2 was only truly unified and joint at the Chiefs of Staff level, an obvious example of over-centralisation rendered more problematic by the fact that the Chiefs of Staff and their subordinate departments in the MOD were not prepared or equipped to exercise many of the operational C2 functions suddenly assigned to them. Moreover, the MOD's decision to assume an operational command role while assigning Northwood the status of Task Force Headquarters created disunity within the command chain, notably where Ascension Island was concerned, and cut straight across the C2 relationship that would otherwise have existed between Northwood and such FLCs as HQSTC, leaving them merely with an 'information link' of questionable effectiveness. Beyond this, establishing a Task Force Headquarters 8,000 miles from the theatre of operations without any subordinate headquarters closer to the Falklands could also be viewed as over-centralisation and made the exercise of joint command extremely difficult at the tactical level.

For the RAF, the extended role of ACAS (Ops) and his staff had never previously been envisaged, nor was it ever expected that HQ 18 Group would suddenly be assigned C2 responsibilities that stretched far beyond its normal competence and overwhelmed its permanent staff and command facilities. No less surprising was the fact that HQSTC ended up on the periphery of the C2 chain. At the TF level, we have previously noted that the RAF's position in this period where tactical doctrine was concerned assumed forward coordination between air and surface force commanders. This was not forthcoming in Corporate, and the Task Groups lacked the air expertise necessary to ensure that limited air assets were used to best advantage to perform offensive, reconnaissance and other functions. Decentralised execution was achieved quite effectively from Ascension but proved far more problematic in the immediate battle area.

That this system worked – to the extent that it did work – is a tribute to innumerable personnel from the RAF as well as the other services. Between them, they took the extremely unusual circumstances in their stride and adapted as best they could to the dramatic increase in the volume and tempo of work, accepting

that a great many normal channels of command had to be bypassed and replaced with unconventional or unanticipated alternatives. Nevertheless, it is easy to see how the Corporate C2 machinery could have been improved and it is regrettable that few of the more significant C2 problems identified during the operation were addressed and rectified before the ceasefire.

By 1984, the deployed Joint Force Headquarters concept was firmly established within UK defence policy, and a new operational headquarters – the Primary Warfare Headquarters (PWHQ) – was being constructed at HQSTC. This became one of the two headquarters deemed suitable for the JHQ role in future OOA operations, the other being Northwood. Meanwhile, at the MOD level, the single-service Vice-Chiefs of Staff and the multiple Assistant Chiefs of Staff positions – including the Operations positions – were eliminated and replaced by single Assistant Chiefs of Staff posts for the RAF, the Army and the Royal Navy. The disappearance of the Assistant Chiefs of Staff (Operations) all but ruled out any prospect that the MOD might again seek to exercise the operational command responsibilities it had assumed during the Falklands Conflict.

## **OPERATION GRANBY: THE FIRST GULF WAR, 1990-91<sup>49</sup>**

In the winter of 1989 and the spring of 1990, world affairs were dominated by the collapse of the Warsaw Pact and the end of the Cold War. Statesmen across the globe heralded a new era of peace, and there was an immediate scramble to collect the so-called peace dividend – substantial savings in public expenditure based on defence cuts. The RAF nervously waited for the axe to fall. Then, without any warning, it was committed to its largest operation since the Suez Crisis of 1956 – the Gulf War, known in the UK as Operation Granby. As part of a US-led coalition formed in August 1990 in response to Iraq's annexation of Kuwait, the RAF's deployed force in the Gulf would ultimately number 157 aircraft, including 50 Tornado GR1s, 12 Jaguars, 18 Tornado F3 fighters, Nimrod maritime reconnaissance and intelligence collection platforms, Hercules transports, tankers and support helicopters. The RAF also deployed two RAF Regiment Wing Headquarters, two surface-to-air missile squadrons and four light armoured squadrons and field squadrons. The number of deployed RAF personnel totalled around 7,000 at peak.

The first Gulf operation is typically divided into two parts using the American operation names Desert Shield and Desert Storm. Desert Shield, from August 1990 to January 1991, covered the initial formation of the coalition following the invasion of Kuwait, coalition operations to deter further Iraqi aggression and support diplomatic pressure to secure her withdrawal, and the expansion of coalition forces in theatre. Desert Storm, launched on 16 January 1991, aimed to evict Iraqi forces from Kuwait. For more than a month, the operation was conducted overwhelmingly from the air, the coalition air forces ultimately flying 100,000 sorties; the RAF flew 6,108. Finally, on 24 February, ground forces launched an offensive into Kuwait and Iraq. Encountering only limited and ineffective resistance, they rapidly brought the operation to a successful conclusion and a ceasefire was declared just four days later.

### **The Air C2 Structure**

The RAF's experience of air C2 during Operation Granby must be considered in historical context. When the Gulf crisis erupted in August 1990, the Cold War had only recently ended and British defence policy was still geared to the NATO area. OOA planning was not ignored but was inevitably felt to be of secondary importance, and the resources specifically allocated to it were limited. The range of contingencies for which plans could be devised was consequently narrow, and

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49. Unless otherwise stated, this chapter is based on the unpublished AHB narratives *Operation Granby: Command and Control*, *Operation Granby: Jaguar Operations*, *Operation Granby: Tornado F3 Operations*, and *Operation Granby: Nimrod Maritime Air Reconnaissance Operations*.

the key requirement was not that plans should suit every eventuality in detail but that they should be flexible enough to permit adaptation as circumstances required. The need for flexibility and innovation in the development of C2 structures was evident throughout Granby.

In 1990, UK C2 procedures for OOA operations were founded on principles that were both national and joint, with command in theatre assigned to a Joint Force Commander operating from a deployed headquarters. In the UK, the Chiefs of Staff would delegate command to a JHQ located either at HQSTC or Northwood. The capacity of both headquarters to fulfil this function was tested annually in live or command-post exercises. One such exercise had been completed only two weeks before the Gulf crisis erupted, HQSTC being assigned the JHQ role.

Preparations for *coalition* operations were focused on NATO and the European theatre, and British forces had no plans to conduct such operations elsewhere. Nevertheless, immediately after Granby was launched, CDS appointed a Joint Commander, Air Chief Marshal Sir Patrick Hine, who set up his JHQ within the PWHQ at HQSTC. As the only UK forces committed to Granby at this stage were drawn from the RAF, he in turn appointed a UK Air Commander, Air Vice-Marshal ‘Sandy’ (later Air Chief Marshal Sir Andrew) Wilson, the Air Officer Commanding 1 Group and the senior RAF officer on the Joint Forces Operations Staff (JFOS) – the staff earmarked to man the JFHQ if it was activated. The Air Commander was directed:

- To contribute, in conjunction with the RSAF<sup>50</sup> and US CENTCOM,<sup>51</sup> to integrated Allied air defence operations within the nominated area of responsibility.
- To prepare to contribute to Allied offensive support and tactical reconnaissance operations should Iraqi forces move into Saudi Arabia.
- To contribute to maritime patrol operations.
- To plan operations as directed by an Allied Force Commander or in conjunction with the Saudi and US military commanders.

The RAF did not possess a deployable headquarters of its own in 1990, so the new UK Air Headquarters in Riyadh was at first a primitive affair and lacked all but the most rudimentary facilities. Initially, it comprised just two rooms within the main Royal Saudi Air Force building that were not even equipped with

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50. RSAF – Royal Saudi Air Force.

51. CENTCOM – US Central Command.

external telephone lines. Two more were then made available in the British Embassy, providing extra space, a secure environment and better communications, including a secure line back to London.

Unlike the Army and the Navy, the RAF did not maintain a formed unit to provide headquarters staff for deployed operations at that time. Staff for the Air Headquarters were therefore drawn from an advance party that had previously been sent to Dhahran air base, and from RAF personnel earmarked for positions within the JFOS (which was not permanently manned). Subsequently, the staff was enlarged on an incremental basis as and when the need arose, selection being based chiefly on subject-matter expertise rather than air C2 training or experience; the majority of augmentees were drawn from the various group headquarters. By the end of August, the Air Commander was supported by some 40 personnel.

The UK Air Headquarters soon outgrew the RSAF building. Via local purchase, the RAF therefore procured portacabins, furniture, air-conditioning units and other essentials and established a dedicated headquarters complex in the RSAF building car park. CIS provisions were also steadily improved, but it was a mammoth task. Indeed, Operation Granby demanded CIS of greater range and capacity than had ever before been marshalled for a British military campaign. According to one after-action report,

At the outset of op GRANBY the deficiencies and weaknesses in CIS in our OOA capability, which had been known for a long time, were brought into stark relief. There was barely sufficient communications equipment to support a small shore-based 2 star HQ ... Successive past attempts to rectify the problem failed, as low priority had been given to satellite, trunk communications, mobility and the vehicles required for OOA operations.

In the limited time available, this situation could only be addressed via a financial outlay that ran into many millions of pounds and through an extensive series of short-notice procurement and installation measures to link up the UK and theatre C2 nodes and the deployed force elements.

By contrast, the integration of deployed RAF forces into the coalition proved relatively straightforward due to the simplicity of the American command structures in the Gulf. These encompassed the Commander-in-Chief – CINCCENTCOM – and his four component commanders, including the US JFACC, Lieutenant General Charles Horner. With US leadership of the coalition founded on this basis, the forces of other nations could easily be incorporated into the US components. Where the RAF was concerned, deployed assets remained at all times under the OPCON of the UK Air Commander, while tactical command was delegated to detachment commanders and tactical control to the JFACC. This meant that the role of the UK Air Commander was largely consultative and

advisory. His task was to collaborate with the Americans to make the best possible use of his forces.

Within this construct, there was scope for considerable flexibility in the way that command was exercised. For example, there was very close command chain involvement in planning and tasking the Tornado GR1 detachments, both in their initial low-level airfield denial role and their subsequent shift to medium-level precision bombing. This was essential not only to address changing operational circumstances – the defeat of the Iraqi Air Force and the high risks involved in airfield denial missions – but also to ensure sufficient logistical support and the deployment of laser-designation capabilities into theatre. By contrast, where the RAF's Jaguars were concerned, there was far less direction from above, and the detachment commander was left to decide whether his aircraft should operate at low or medium altitude in Desert Storm. Pressure from squadron level also resulted in capability enhancements, such as the acquisition of the CBU-87 cluster bomb and computed weapon aiming for the CRV-7 rocket.

The single fundamental command function that the UK Air Commander retained was the veto. While he could *advise* US commanders on how the RAF detachments might best be employed, he could if necessary *insist* that they should not be employed in certain circumstances. This so-called 'red card' function has remained fundamental to the exercise of coalition air C2 ever since.

Although, from a modern-day perspective, these arrangements might appear familiar and rational, at the time they seemed unorthodox. Even so, they worked very effectively and with the minimum of friction. More challenging was the task of reconciling national and coalition C2. As we have seen, the RAF initially provided all the UK force elements deployed on Operation Granby. No land contingent was committed, and the Royal Navy task group in the Gulf functioned under the auspices of an entirely separate operation – Armilla – which had been initiated in 1980. The limited scale of British deployments and the fact that only one service – the RAF – was at first involved persuaded the Chiefs of Staff that it was unnecessary to create a JFHQ in theatre; the Air Headquarters apparently sufficed.

The obvious weakness of this arrangement lay in the fact that no single UK commander could be appointed in theatre due to the separate status of the Armilla Task Group. Apart from the fact that the Joint Commander had to deal with two command chains, there was no British officer in the Gulf who could speak for all deployed UK forces at the interface with CINCCENTCOM. The primary decision-making body in Saudi Arabia – CINCCENTCOM's Component Commanders Committee – comprised the CINC himself, his deputy, his COS and his component commanders. Both the Joint Commander and the Air Commander soon grasped that UK representation on the committee was highly desirable, but it would depend on the appointment of a UK JFC.

Proposals to appoint a JFC were first tabled early in September 1990, but the issue proved controversial. In the post-Cold War environment, all three armed

services faced reductions in size following the *Options for Change* defence review. They each reasoned that a demonstration of their value and potential might stave off the most far-reaching plans for cutting their strength and that, for this purpose, a strong influence on C2 was necessary. The Royal Navy was also extremely reluctant to accept that an officer from another service might exercise operational C2 over the Armilla Task Group. Yet the Air Commander was a two-star officer whereas the CTG held one-star rank, and the JFC's role could hardly have been exercised by a naval officer afloat in any case. It therefore followed that, if a single command chain was established, the appointment would go to Air Vice-Marshal Wilson.

For this reason, the Royal Navy raised strong objections to the unification of UK C2 in theatre. A number of convoluted and suboptimal alternative C2 options were then considered but rejected, and it was ultimately necessary for CDS, Air Chief Marshal Sir David Craig, to impose a solution on CNS and CINCFLEET. This involved the retention of full command by the Front-Line Commanders in the UK and the assignment of operational command to the Joint Commander; OPCON of all deployed UK forces would be exercised by the JFC but many day-to-day OPCON functions would be delegated to the CTG, the precise division of authority being determined by the Joint Commander and CINCFLEET. The JFC was then named the British Forces Commander Middle East (BFCME) and the appointment was bestowed on Air Vice-Marshal Wilson; on 19 September, CDS informed the Secretary of State that the BFCME had been given a seat on the US Component Commanders Committee. However, the government had meanwhile announced the dispatch of British ground forces to the Gulf and the enlargement of the air contingent. On this basis, the BFCME post was elevated to a three-star Army appointment, leaving the Air Commander free to direct his focus entirely towards the deployed RAF detachments.

The advantages that stemmed from this revision of C2 in the Gulf are easily understood, particularly where access to the Component Commanders Committee is concerned, but there was also one obvious disadvantage. Inevitably, the appointment of a three-star JFC also implied that he should have a JFHQ – Headquarters British Forces Middle East (HQBFME). And yet, because all deployed UK air, land and naval forces were effectively incorporated into US-led components, there was only a limited role for the JFHQ to play. Indeed, to an extent, it represented an unnecessary command tier and its very existence created the potential for friction and the extension of decision-making processes.

This was fully grasped by Air Vice-Marshal Wilson, who sought to limit its scale and the scope of its activities to reflect the realities of C2 in a US-led coalition environment. It was not entirely appreciated by the new BFCME, Lieutenant General Sir Peter de la Billiere, who later recorded that his aim on reaching the Gulf was to integrate the three services – to 'pull them together' into a 'corporate, tri-service group'.

In my mind it was essential that Navy, Army and Air Force should be properly co-ordinated and have their efforts directed in such a way as to maximise the effect of the British contribution as a whole.

This declaration unquestionably exaggerated the potential for British forces to operate independently in the Gulf. De la Billiere was not appointed to pull British forces together into a 'corporate, tri-service group'.

As the two officers held such different views on the role of HQBFME, there was considerable tension during their handover period early in October, and Wilson ultimately put a secure telephone call through to the Joint Commander in the UK to establish whether de la Billiere was acting under his instructions. The Joint Commander replied that 'he had not briefed any changes at all.' This effectively confirmed his intention that the HQBFME should exert only limited influence and, where air C2 was concerned, his aspirations were entirely fulfilled.

The nature of command and control connections with the Saudis was also finalised in September; Air Vice-Marshal Wilson later recalled that the negotiations were difficult and highly charged. Whereas it was clear that military operations would be planned and directed through CINCCENTCOM, Saudi Arabia's position was paramount: operations were likely to be conducted from her soil and under her auspices and could not be initiated without her sanction and involvement. At the highest level, military decisions were taken by the US/Saudi War Council and, as CINCCENTCOM was the US representative there, it could be tacitly assumed that no orders would be issued from his headquarters without previous sanction from the Saudis. Nevertheless, it was important that British command relations should not appear to be conducted exclusively with the Americans, even though this was *de facto* the position. Formally, at least, the sovereign role of Saudi Arabia in the higher direction of the campaign had to be recognised. In addition, not least for diplomatic reasons, the Saudis were anxious that their command relationship with the UK should not appear different from their relationship with other coalition members, even if some difference was implied by the intimacy of in-theatre Anglo-US C2 arrangements.

The Saudis eventually accepted that British forces would be integrated into the US component command structure. The BFCME was simply tasked to maintain a close liaison with the Saudi Joint Commander-in-Chief, Prince Khalid bin Sultan. They also agreed that British forces would 'act in accordance with the overall strategic guidance of the supreme commander of the Saudi Arabian armed forces' but would remain under national command. A memorandum of understanding to this effect was drawn up on 18 September 1990.

Following Air Vice-Marshal Wilson's promotion and appointment as AOC RAF Germany, Air-Vice Marshal WJ (later Air-Chief Marshal Sir William) Wratten became UK Air Commander in the Gulf. The deployed RAF forces under

his command were fully integrated into the American command chain under General Horner, all plans for the offensive and defensive employment of RAF aircraft were developed through collaboration between Wratten's and Horner's staff, and Wratten's headquarters remained co-located with Horner's in Riyadh. However, as the various RAF detachments were formally under national command, Wratten also served as Air Commander to the BFCME, providing him with daily briefings supplemented by many informal meetings. These contacts were facilitated by the fact that his quarters were next door to de la Billiere's and were shared with the COS at HQBFME. He also convened regular meetings with the detachment commanders and reported by telephone to the Joint Commander, normally twice per day. In this way, a national UK air C2 chain was maintained alongside the coalition structures, but the RAF's role in Desert Shield and Desert Storm was overwhelmingly determined by the coalition and the UK Air Headquarters and not by HQBFME.

The system of divided OPCON functioned very smoothly in most respects, as far as the RAF was concerned. When friction occurred, it was usually because the correct command channels had been bypassed. For example, in December 1990, there was a disagreement between the Air Headquarters and the Royal Navy's CTG concerning the geographical boundaries of the operations area patrolled by the RAF's Nimrod MR2s. The CTG wished to extend the operations area further north, but the Air Headquarters opposed the extension, arguing that the operational risks involved outweighed such benefits as were likely to accrue.

Theoretically, as the Nimrods were RAF assets, this should have settled the issue unless there was a pronounced change in the risk-benefit equation, but the CTG was not prepared to accept the Air Headquarters' stance and appealed to the BFCME to intervene. He initially received an enthusiastic response, but the BFCME ultimately decided that he could not overrule the Air Commander without first referring the matter back to JHQ, and it was not until the MR2 detachment was completely re-rolled to so-called Direct Support in January that the extension was approved. Yet such episodes were very rare. The BFCME's focus was chiefly on British ground forces, and his main contribution to the Desert Storm plan was confined to the role of the British Army. It is perhaps worth noting that, like CNS and CINCFLEET, he was reluctant to see his service fully integrated into the coalition. Indeed, he freed the UK Land Component from subordination to the US Marine Corps on the coalition right, allowing it to be deployed at divisional scale – far more independently – as part of CINCCENTCOM's famous left hook.

The Operation Granby air C2 arrangements overrode and supplanted existing peacetime structures, and it took time for the implications to be fully assimilated. This was especially true where the RAF's group headquarters and the individual detachments in the Gulf were concerned. As the groups were accustomed to working directly down to station level and vice-versa in the UK, the requirement to work up through JHQ instead was not always embraced at

first, and many RAF staffs meanwhile continued to employ their established command processes. This sometimes meant that decisions with important operational implications were taken outside the formal Granby C2 chain.

This problem particularly affected the multiplicity of aircraft enhancement proposals initiated under Urgent Operational Requirement (UOR) procedures. As late as December 1990, the Director of Operations at JHQ felt constrained to remind all the relevant headquarters and the MOD of the problems that persistently arose after Granby issues were routed through the wrong channels. The correct chain of command to deployed units was through JHQ and HQBFME.

### **The MOD Role**

The MOD's role in operational C2 during the Falklands conflict was noted earlier in this study. We have also observed that the MOD's C2 functions were not very precisely laid down in doctrine when Operation Granby was initiated. The organisational changes implemented in the MOD during the 1980s and the adoption of the JHQ and JFHQ structure all implied that there would be no return to the system of command employed during Operation Corporate. Nevertheless, the new command arrangements soon came under critical scrutiny because the Secretary of State for Defence, Tom King, considered JHQ to be insufficiently responsive.

The fundamental difficulty arose from a relatively new development – the almost instant transmission of news via satellite broadcasting, which sometimes resulted in the press and Members of Parliament becoming aware of occurrences in theatre before the responsible government ministers. Mr King soon found that he was politically vulnerable and came to believe that he needed a more direct channel of communication with the Gulf. This, he felt, could be achieved if the number of intervening headquarters was reduced and the command lines from Riyadh went straight to the MOD rather than JHQ. He first raised his concerns with CDS following a visit to the Gulf at the end of August 1990. While in theatre, he invited the UK Air Commander to contact him directly if that seemed necessary at any time. On his departure, he told Air Vice-Marshal Wilson that he wished him to be his emissary in Saudi Arabia on all matters up to the highest level.

The issue came to a head in late September, when Mr King prepared a lengthy memorandum on the subject. In it, he argued that reporting from the front line was too slow, that it was difficult to pin down specific responsibilities within the MOD or between the MOD and JHQ, and that there was a reluctance in some quarters to provide him with detailed information quickly. Referring to the unusually complex political and strategic dimensions of the operation and 'the exceptionally close TF/Press presence', he argued that there was an urgent need to respond rapidly and effectively to developments in theatre. He could not

discharge his responsibilities as Secretary of State properly without what he termed ‘a frank and quickly responsive relationship with the Department’, and he was impressed by the simpler command chain adopted by the United States, which ran directly from CENTCOM’s forward headquarters in Riyadh to the Department of Defence in Washington. Mr King therefore proposed that the entire command, administrative and reporting role of JHQ be re-examined and that the possibility of transferring headquarters functions from the UK to Riyadh be considered. He also sought to streamline reporting channels inside the MOD.

The Secretary of State’s criticisms were in some ways compelling, yet they were not supported by specific examples, and his grasp of UK C2 arrangements was rather less than comprehensive. Apart from the fact that he underestimated the role of JHQ, implicit in his arguments was the transfer of some JHQ functions to the MOD – a direct reversal of the decentralisation pursued since Corporate. Indeed, there is no doubt that the MOD was even less prepared to play an operational C2 role in 1990 than in 1982. Almost more striking than the memorandum itself, however, was the timing of its preparation. Mr King elected to raise this fundamental C2 issue while CDS was abroad, asking VCDS, General Sir Richard Vincent, to review the matter urgently instead.

On 26 September, General Vincent duly visited JHQ to consult the Joint Commander. In the recollection of the Deputy Chief of Defence Staff (Commitments) (DCDS(C)), who also attended the meeting, the discussion was distinctly uncomfortable. Under the Secretary of State’s remit, their mission was to decide whether JHQ – so recently established by the Defence Staff – was necessary at all, or whether it could be removed from the command chain along with the Joint Commander himself.

At the beginning of the meeting, VCDS tabled a loose minute outlining his thoughts on the issue; this was to provide the basis for a submission to CDS on his return to the UK. No copies of the document have survived but it concerned the Joint Commander because ‘it appeared to go some way towards accepting S of S’s premise that the present OOA C2 structure would slow down the decision-making process.’ Air Chief Marshal Hine pointed out that no specific inadequacies in the C2 structure had been revealed and that a similar structure had been employed in a number of recent OOA exercises. He clearly felt that the Defence Staff had too readily referred the matter to JHQ without properly explaining some of the issues to Mr King – particularly ‘the difference between political direction and military C2. It was essential to get him to understand this difference and, as military men, it was our duty to do so.’ He also drew attention to the practical problems involved in the Secretary of State’s proposals. First, the MOD could not provide unified operational and logistical C2 in the manner exercised by JHQ, and the separation of these functions was contrary to all accepted military practice; second, the MOD lacked the necessary communications and intelligence infrastructure to assume JHQ’s functions.



Marshal of the Royal Air Force Sir David Craig, Chief of Defence Staff during Operation Granby.



Air Chief Marshal Sir Patrick Hine, UK Joint Commander during Operation Granby.



Air Chief Marshal Sir Andrew Wilson, photographed in 1993; as Air Vice-Marshal 'Sandy' Wilson, he was the first UK Air Commander and the first UK Joint Forces Commander in Operation Granby.



Air-Vice Marshal William Wratten (left), who succeeded Air Vice-Marshal Wilson as UK Air Commander, being greeted by the RAF Detachment Commander at Tabuk air base in December 1990.



Tornado GR1s equipped with JP233 runway cratering munitions during Operation Granby.

DCDS(C) was apparently sympathetic to these arguments. In addition, he felt that the necessary degree of separation between the military commander and the Secretary of State would be impossible to maintain if the Joint Commander's functions were exercised from the MOD. 'It was important to remove the C-in-C level from the Ministry of Defence, otherwise Tom King was in danger of assuming that role himself.' He subsequently recalled that the established procedure by which OPCOM of deployed forces was exercised from the UK during OOA operations was favoured by all three services. At the conclusion of the meeting,

VCDS agreed to re-draft his submission to CDS to reflect not only the difficulties associated with providing adequate communications and intelligence support, but also to reflect military concern over any attempt to split functional control and responsibility for logistic support.

It was also agreed that 'the S of S should be encouraged to seek the collective view of the COS before any fundamental changes to the C2 structure were made.'

VCDS duly conveyed the meeting's conclusions to CDS on his return to the UK together with a recommendation that internal MOD arrangements for briefing the Secretary of State be improved. He pointed out that Mr King's office sometimes passed his questions to the wrong authorities in the first instance, a problem that might be solved through the establishment of a briefing cell. The cell would be answerable to CDS and the Secretary of State, handling all enquiries from the Secretary of State's office initially.

Mr King met CDS and VCDS on 28 September to resolve the issue. VCDS reiterated all the arguments in favour of retaining JHQ, but he did concede that a better flow of information was needed, not least because the media were now so well equipped to pass back information from theatre. CDS agreed, referring to the idea of establishing a briefing cell. In response, the Secretary of State now crucially 'accepted that the JHQ at High Wycombe had important functions'. His concern was simply that 'it should not impede rapid communications.' He desired direct communication between BFCME on one hand, and himself and CDS on the other, arrangements being made to notify the Joint Commander of any such dialogue. He did not favour the creation of new 'cells' for processing information, which were likely in his opinion to create fresh bottlenecks. Rather, there should be direct reporting from desk officers to himself and CDS, while others in the command chain were kept informed. Although major proposals would obviously have to be staffed, more routine matters could be submitted direct. He then declared that 'he would ask his office to make detailed arrangements on these lines.'

Under the system that the Secretary of State had in mind, he and CDS would in reality have received operational information before the Joint

Commander. Such information would also have reached Mr King before his own staff, bypassing desks that might have verified, augmented or otherwise contributed to it. It is difficult so see how raw and uncorroborated reports of this nature could possibly have been very useful to him. Nevertheless, he remained intent on accelerating the information flow. The service chiefs were, on the other hand, determined not to undermine the position of JHQ.

It is therefore hardly surprising that the issue was never fully resolved. Both CDS and BFCME scrupulously operated through JHQ, and their subordinates were specifically instructed to do so. Hence, the only direct channel between London and Riyadh took the form of regular telephone calls from the Secretary of State to General de la Billiere. It was agreed that CDS's office should be notified before any call to Riyadh so that he or a member of his staff could be present, but Mr King did not adhere strictly to this principle. The BFCME always reported the gist of these conversations to JHQ afterwards. If drawn by Mr King on to matters not previously discussed with JHQ, the BFCME stressed that he was offering only a personal view and that the Joint Commander would present the official position after he had been briefed.

Despite the Secretary of State's reservations, an Operation Granby 'Assessment Cell' was created within the MOD and tasked to provide an instantaneous briefing point for the Secretary of State and CDS. Its existence helped to parry Mr King's criticism, but he made little use of it and continued to demand impromptu briefings from desk officers on a wide range of Granby matters – briefings from which his own officials were often excluded.

JHQ's perspective on what was in many respects the same problem was of course very different. It was naturally recognised that the Secretary of State had to be closely informed about many operational matters and that key decisions had to be referred to his level. Yet there was a mass of more routine business that could more appropriately be handled by professional military staffs and which had to be dealt with promptly. Many deadlines were the more rigid because they were linked to a chain of associated activities. The Director of Operations at JHQ recalled, for example, that the enlargement of the support helicopter force in the Gulf (Pumas to support 7th Armoured Brigade) necessitated a further decision to deploy the necessary support equipment and weapons. As the support equipment was to be moved by sea while the helicopters were dismantled and flown to the Gulf in transport aircraft, shipping arrangements had to be cleared well ahead of the aircraft movement because of the longer transit times.

At JHQ there was intense frustration over the length of time required by the MOD to sanction such deployments. As early as 4 September, CDS was warned of 'a bow wave of feeling building up amongst the staff about the amount of additional and, as seen by them, unnecessary work which is being generated by ministers back-seat driving'. The problem persisted and, on the eve of Operation Desert Storm, the Director of Operations went so far as to warn the Joint Commander that the delays were having an adverse effect on morale. Where

the Pumas were concerned, for instance, JHQ was left with no choice but to dispatch the support equipment before ministerial endorsement was received. On one occasion, it was necessary to seek ministerial authority to deploy just ten sappers to the Gulf.

It appeared that ministers and their staffs were involving themselves in incidentals and demanding consultation about matters that did not require their input. To this end, they regularly sought submissions buttressed by extensive background briefings, along with full consideration of alternative strategies and likely ramifications. Important decisions were postponed while briefs and discussion papers were drafted and circulated. For the hard-pressed JHQ staff, this was a severe distraction from the mass of other business demanding urgent attention. Under constant pressure from the MOD to bring deployed forces to operational status within prearranged time-scales, JHQ ironically found these deadlines jeopardised by the ministry itself. The Director of Operations made two recommendations, which the Joint Commander in turn passed to CDS. First, the Joint Commander should see all submissions to ministerial level concerning Operation Granby so that he was not blind to any significant developments that might directly affect the conduct of operations; second, the Secretary of State should delegate to CDS or DCDS(C) authority to approve minor force enhancements.

The difficulties experienced by JHQ became the focus of a post-operation report likewise prepared by the Director of Operations. This went so far as to suggest that

Some elements within the MOD had difficulty recognising that the reality of war against an aggressive dictatorship demanded that the central staffs should function as a centralised war policy-making structure with a precise delegation of authority to the operational commander. Their evident unwillingness to move away from the niceties and comforts of peacetime bureaucracy placed pervasive constraints on the planning and implementation of a most complex plan involving the full gamut of operational and support considerations ... Sec (O)(C)'s<sup>52</sup> position apparently reflected greater concern for the well-being of the S of S if faced with hostile questions in the House rather than the well-being of our men and women going to war.

These criticisms may seem harsh, but they were supported by several specific and detailed illustrations of slow decision making in the MOD. It was recommended that, in any future and comparable operation, a strong MOD Secretariat representation at JHQ level would be desirable and this proposal was endorsed in

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52. Sec (O)(C) – Secretariat (Overseas)(Commitments).

the main Lessons Learnt documents prepared after the cessation of hostilities in the Gulf (see Annex A).

## Planning the Air Campaign

The task of planning the air campaign was overwhelmingly the responsibility of the USAF; it can more properly be considered a matter of USAF than RAF history and receives comprehensive coverage in the official USAF narrative.<sup>53</sup> Nevertheless, the RAF was a leading contributor to coalition air power and was fully integrated into the air campaign plan. It also prepared its own targeting philosophy and, uniquely among the US's allies, gained representation within the planning team that devised the Desert Storm air campaign. For these reasons, a brief survey of planning structures and procedures is essential.

Granby differed profoundly from the other operations considered in this study where the air campaign was concerned. In Granby, the coalition had five months to devise an offensive based on classic air campaign planning principles. The result was a very highly choreographed, phased assault that incorporated strikes on innumerable fixed targets, as well as Iraqi ground forces. At the time, given the revolutionary air capabilities employed in the Gulf, it was virtually taken for granted that the planning process was also breaking new ground. However, Granby now has the appearance of a swansong where conventional air planning is concerned. It is important both to illustrate and reflect on the contrast between the Granby air campaign, with its systematic phases and objectives, and later air operations, which were characterised by far more reactive and dynamic tasking. The overall function of the air campaign in coalition strategy was described by CINCCENTCOM in the following terms:

In order to attack a position that is heavily dug-in and barricaded such as the one we had here, you should have a ratio of five-to-one in the way of troops in favour of the attacker ... We were outnumbered as a minimum, three-to-two as far as troops were concerned ... In addition to that, they had 4,700 tanks versus our 3,500 when the build-up was complete, and they had a great deal more artillery than we do ... We had to come up with some way to make up the difference ... What we did was start an extensive air campaign.<sup>54</sup>

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53. E.A. Cohen et al, *Gulf War Air Power Survey (GWAPS) 1: Planning and Command and Control* (Washington DC, 1993).

54. CENTCOM news briefing, Riyadh, 27 February 1991, published in Captain ME Morris, *H. Norman Schwarzkopf: Road to Triumph* (London, 1991), Appendix A, pp. 242-243.

As we have seen, responsibility for the air campaign rested with Lieutenant General Charles Horner, the JFACC, who was also CINCCENTCOM's deputy. Horner exercised his authority through his Tactical Air Control System (TACS), the organisation, personnel, procedures and equipment necessary to plan, direct and control tactical air operations and co-ordinate air operations with other services and allied forces. Theoretically, these functions were the responsibility of Horner's headquarters and CAOC, which consisted of Combat Plans and Combat Operations divisions and produced the daily Air Tasking Order (ATO) that dictated all coalition air activity. However, in practice, the Combat Plans division was assigned only a limited planning role and chiefly concerned itself with joint plans for the defence of Saudi Arabia. For security reasons and because of the political sensitivity surrounding offensive operations, planning for the air campaign was assigned to an entirely separate organisation, the Special Planning Group (colloquially known as the 'Black Hole'). The Black Hole was not initially concerned with joint planning and conceived its task in strategic terms. It was to devise an offensive plan 'to achieve national and military objectives to *win* the war through air power alone; that is, to make the ground campaign unnecessary'.

While this goal might appear ambitious, it was dictated at the strategic level and not by Horner and his senior planners. No alternative strategy could be considered until the American government took the decision to deploy the US Army and the Marine Corps to the Gulf on a scale large enough to permit the launch of a ground campaign. Only in October, when the number of US ground troops allocated to CENTCOM was doubled, could a ground assault be incorporated into offensive planning.

Brigadier General Buster Glosson ran the Black Hole and established a staff of 40 officers, who started planning from first principles. They comprised specialists with experience of the various roles, aircraft types and weapons systems, intelligence and logistics experts and planners from the other services. At first, there was a single RAF representative of wing commander rank; he was later joined by an intelligence officer. Glosson isolated the following objectives:

1. Establish air superiority.
2. Isolate and incapacitate the Iraqi leadership.
3. Destroy Iraq's nuclear, biological and chemical warfare capability.
4. Eliminate Iraqi offensive military capability.
5. Eject the Iraqi army from Kuwait.

The planning staff divided the air offensive into four phases, each with its own set of objectives and time estimates, though the phases were not necessarily seen

as discrete or sequential. Phase 1 was termed ‘The Strategic Air Campaign’ and comprised a wide range of target systems. These included air defences, aircraft and airfields, strategic chemical, biological and nuclear capability, leadership targets, command and control, Republican Guard, telecommunications facilities and key elements of the national infrastructure such as critical lines of communication between Baghdad and Kuwait, electric grids, petroleum storage and military production facilities. Phase 2 was ‘Air Supremacy in the Kuwait Theatre of Operations’ (KTO) and was to be initiated at about the same time as Phase 1. Phase 3, ‘Battlefield Preparation’, was intended to reduce Iraqi combat effectiveness in the KTO by at least 50 per cent; Phase 4, commencing three weeks into the air campaign, was to be conducted in conjunction with the ground offensive with the specific objective of liberating Kuwait, cutting key lines of communication into south-east Iraq, and destroying the Republican Guard.

As the planning process was refined, it became more concerned with particular types of target – command and control sites, Republican Guard forces, Scud missiles – than with phases, and the distinction between the phases became less meaningful; but the 50 per cent attrition level for Phase 3 remained a key objective. It was assumed that the coalition would be called on to attack first, but there was an alternative defensive plan for the eventuality of an Iraqi offensive, and a ‘reflex’ plan providing for a transition from defensive to offensive postures.

Independently, early in September, DCDS(C) set up a Targeting Policy Cell in the MOD to devise targeting philosophies and options that CDS could consult when advising ministers and directing the Joint Commander. The cell began its deliberations by considering the UK’s strategic and military objectives and the possible circumstances in which offensive operations might occur. It went on to devise a range of targeting options governed by six considerations:

1. The target should contribute to the military operation’s precise objectives in a manner that was necessary, proportional and relevant.
2. The target should be militarily significant.
3. Suitable weapons should be available to ensure that the aim was achieved.
4. Achievement of the aim should not result in unacceptable levels of attrition.
5. Targets prohibited by international law should be avoided; collateral damage, injury to civilians and the destruction of centres of cultural or religious significance should be minimised.

6. Iraq should return to a state of normality after the cessation of hostilities.

Finally, the planning team isolated fifteen target categories and subjected each to a detailed analysis in accordance with the foregoing criteria. By this means, they compiled a shortlist of priority target categories, 'the target systems that would be most worthwhile attacking to wreak the greatest damage quickly on Iraq's war-fighting capacity for the least price in terms of effort and losses'. The resulting Targeting Philosophy paper formed the basis of the Targeting Directive (TD) issued by CDS to the Joint Commander on 12 October, and the Joint Commander subsequently confirmed that the directive was well aligned with US planning and targeting work in the Gulf, which was subject to constraints virtually identical to those imposed on UK forces. It was also discussed in some detail with the Americans when DCDS(C) visited the Pentagon later in the month. The directive identified seven primary military target categories:

1. Airfields
2. Missile systems
3. Military command, control communications and intelligence, headquarters facilities
4. Weapon storage and repair facilities, including CB
5. Other military activity
6. NBC production facilities
7. Defence-related industries – missiles and land arms

With the exception of nuclear, biological or chemical warfare related targets, which required higher approval, authorisation to attack was delegated through the Joint Commander to UK commanders in theatre if targets in these categories were supporting Iraqi offensive action, the Iraqi occupation of Kuwait or Iraqi action against coalition forces. Such authorisation could also be assumed for planning purposes. In other words, the Air Commander could approve strikes against such targets without referring back to the UK. These targeting 'delegations' became another familiar feature in the exercise of air C2 in the period covered by this study. In Operation Granby, they were subject to the following constraints and exceptions. Attacks were to comply with international law and were not to target sites of religious or cultural significance; they were to seek to minimise collateral damage, and commanders were to 'take all reasonable precautions to spare

civilians from incidental harm’ and ‘minimise the risk to Allied hostages held in or near target areas’. Beyond the basic delegations, a second list – Other Targets Supporting Military Operations – was prepared covering civil infrastructure:

1. Government control centres
2. Oil facilities – production, refineries, pumping stations
3. Civil electronic communications
4. Shipping
5. Water facilities, e.g., dams, treatment plants, irrigation
6. Ports and harbours
7. Electric power generation, transmission and control
8. Transportation, including bridges, roads, rail and rivers

Authorisation to attack targets in these categories was specifically withheld, and theatre commanders were to refer targeting recommendations upwards. The directive stated: ‘If you wish to recommend that you be authorised to attack any such targets, your recommendation should specify how such an attack would assist the implementation of your objectives.’

COMCENTAF’s target list grew from 84 entries in August 1990 to 477 by early January 1991. The UK was always at liberty to propose additional targets, but this proved unnecessary in practice. When the RAF representative in the Black Hole examined the list, he found that all locations that the RAF deemed worthy of attack were already included. The UK Air Commander could advise CENTAF on the targets best suited to the RAF’s capabilities, and conversely, if he was unhappy about particular targets, he could dissent. But he could not dictate which targets the RAF should attack, nor did he ever attempt to do so. Nor did CENTAF allocate or identify particular targets as ‘RAF targets’. The sum of the targets and the resources used against them were all combined into a single consolidated air campaign.

The CENTAF planners prepared a MAAP for the first 60 hours of the offensive, which was to be rigidly followed for the first 48 hours. Thereafter, planning was sufficiently flexible to allow targets to be varied in accordance with early assessments of bomb damage and of the campaign’s overall success. A similar pattern of planning continued in a rolling three-day sequence throughout the period of hostilities: Operation Granby thus provided the RAF with its first live operational experience of the ATO system. As the MAAP for Day 1 was

implemented, planning for Day 2 would be finalised and translated into specific tasks in the ATO; meanwhile, planning for Day 3 was initiated.

The cycle began at 0500 hours each day, when CENTAF's Guidance, Apportionment and Targeting (GAT) Group began constructing the MAAP for Day 3. The GAT Group would consider progress with the target list and the success of previous missions to determine how many new targets could be attacked and how many previous targets revisited. It would then produce target planning worksheets covering weapon-to-target matching, selection of impact points and weapon effort. At the beginning of Day 2, the MAAP was passed to the Air Tasking division, which was responsible for compiling the detailed ATO. Air Tasking collaborated with Airspace Control to ensure deconfliction before entering the tasking data into the Computer Assisted Force Management System, which was used to disseminate ATOs to tasked air detachments.

ATO preparation was an exceptionally complex process. The CENTAF planning system was established to support a maximum of 2,400 sorties per day but more than 3,000 were envisaged by the tenth day of Desert Storm. Meticulous coordination was necessary given the complexity of the operation and the confined airspace available: offensive aircraft would usually be flying at the same time as AWACS, tankers and aircraft committed to Suppression of Enemy Air Defences (SEAD). For example, on the first day of the operation (17 January 1991), the ATO contained 75 force packages and covered 156 target arrays. It included 24 different types of attack aircraft, nine types of tanker, seven air defence types and three types of AWACS. It listed 382 combat sorties during its first six hours supported by 299 tankers; 1,824 AAR hook-ups were to deliver 26 million pounds of fuel. At one stage, six layers of tankers would be flying – at night and in radio silence – each layer separated by only 500 to 1,000 feet. To complicate matters further, targeting was subject to constant revision throughout Day 1 and Day 2 of the planning cycle due to changing priorities, intelligence and BDA from the on-going air campaign.

In these circumstances, the pre-war aspiration to halt inputs into the ATO at 1400 on Day 2 proved unduly optimistic – as did the goal of transmitting it to units by 1800. Indeed, for the first three weeks, ATOs could emerge at any time between 1800 and 2100. This left little time to send the finished document to detachment level (particularly if the detachment lacked a secure transmission link and the ATO had to be delivered by hand) and for the units to digest its contents, brief personnel accordingly and mount the sorties. Changes were also regularly introduced after the ATO's initial transmission, causing severe difficulties for the units concerned.

Ultimately, the TACS functioned satisfactorily during Operation Granby and proved that the centralised direction of an exceptionally complex theatre-wide campaign was possible. The task was facilitated by technological innovations, such as satellite communications, airborne command and control platforms like AWACS and JSTARS, realistic peacetime training, and

meticulous preparation in theatre during the Desert Shield phase of the operation. The difficulties were nevertheless considerable. Indeed, according to the official USAF historians,

The primary obstacle faced by the commanders of coalition Air Forces during Desert Storm was not Iraqi resistance but organizational problems within the Tactical Air Control System itself.

Four of these were particularly prominent. First, the need to update targeting plans continuously on the basis of previous results caused the GAT to extend its powers backwards into intelligence and forwards into air tasking, yet neither the intelligence, nor the tasking, nor the GAT personnel had trained for this eventuality; the efficiency of tasking suffered as a result. Second, the rapidity with which the air campaign developed and the speed with which modern intelligence-gathering assets could collect information outstripped established tasking procedures, raising questions about the efficacy of the ATO process. Third, decision-makers at various levels of the TACS frequently lacked the information they needed to direct the air campaign or did not receive it on time. For example, the TACC often struggled to supply timely BDA for the air campaign's planners. Fourth, a variety of interpersonal and jurisdictional problems arose from the creation of various *ad hoc* command and control organisations, which to some extent superseded established structures.

In short, while the Gulf War demonstrated that the means existed to direct air operations of great scope and complexity, technological and organisational innovations designed to solve long-standing air C2 problems sometimes generated entirely novel challenges for air commanders to address.

### **Rules of Engagement**

To integrate deployed RAF detachments into the multi-national coalition during Operation Granby, it was necessary to accept US direction in operational matters and in planning for offensive action to liberate Kuwait. As we have seen, the Air Commander could not devise national plans for air operations or dictate how his forces were employed in the coalition. Instead, his task was to advise CENTAF on the most effective use of British assets and – as the so-called red card holder – ensure that they were not committed to operations for which they were unsuited, or which were contrary to British strategic objectives as defined by the government. To fulfil this role, he required unambiguous terms of reference from London. These were provided by his directive from the Joint Commander, by the TD and by the UK ROE.

Considerable challenges were encountered in framing workable ROE for Granby because of the need for harmonisation with the other coalition powers.

Although the problems were soon resolved, for a time they threatened to halt RAF participation in air defence operations. After more than three decades of coalition warfare, this might appear to be a familiar story. However, in 1990, the issue of cross-coalition ROE alignment presented entirely novel problems to the commanders and staffs involved.

By their very nature, ROE seek to strike a balance. If they are too restrictive, deployed forces may find themselves impotent when confronted by a pre-emptive attack. If they are too liberal, they leave scope for action that may appear provocative or aggressive: a deployment intended to deter hostilities may inadvertently precipitate them. Efforts to achieve this balance may be identified in the declared objectives of the UK ROE for Operation Granby. They were designed ‘to deter further aggression by Iraq and, if necessary, to defend Saudi Arabia and other friendly states in the area as part of [the] multi-national effort’. The ROE had also to ‘recognise both the varied nature of the threat and the possibility of surprise attack’ and be framed in a manner that did not affect the inherent right of self-defence.

Difficulties arose in the Gulf following the arrival of the Tornado F3 detachment at Dhahran on 11 August 1990. At this early stage, there were no agreed coalition ROE, and deployed UK and US forces had little knowledge of each other’s rules, the relevant documents being confined to exclusively national circulation. There were only rather vague preconceptions to the effect that British ROE tended to be more restrictive than American.

The Operation Granby ROE were first discussed at a Prime Ministerial meeting on 9 August at which it was agreed that the MOD would compile draft rules affecting both air and maritime deployments to the Gulf. Once prepared, these were approved by the Secretary of State for Defence. On the following day, the Assistant Under-Secretary (Commitments) briefed the Chiefs of Staff on ROE, drawing attention to the basic principles and features of British practice as then defined by Joint Service Publication (JSP) 398. Anticipating the deployment of a multi-national force, he emphasised the importance of consistency between the procedures of participating nations, while maintaining that ROE should ultimately be based on national documents and methodology. Summing up, CDS insisted that the necessary ROE be in place before the F3s reached the Gulf from Cyprus. The Joint Commander’s directive instructed him to report back to CDS on the ROE position as a matter of urgency.

The Joint Commander immediately recognised that it would be difficult to maintain a national interpretation of ROE in a coalition environment. Absolute national control could hardly be exercised if decision making was partially ceded to other countries – even allies – and it seemed unlikely that British forces would be able to participate fully in coalition operations if they insisted on observing their own rules. He therefore confirmed that UK ROE were adequate for the F3s’ transit flight from Akrotiri to Dhahran but advised the Director of Air Defence at the MOD that the rules were ‘unworkable in an integrated allied AD system’.

We would need to harmonise them with the Saudis and Americans and recommend changes once we had established the AD and airspace management procedures in play.

Under the initial ROE, RAF fighters were constrained to apply national criteria to the categorisation of an intruder as ‘hostile’ and to the definition of a ‘hostile act’ before they could respond. F3 crews were required to confirm that their target was an Iraqi military aircraft (effectively to identify them visually) and that it had committed or was clearly about to commit a hostile act. DCDS(C) had issued instructions that they were ‘not to rely on a third party for identification of an Iraqi military aircraft’. His position was unquestionably influenced by the shoot-down of Iran Air flight 655 by the USS Vincennes in the Gulf just two years before, after the aircraft, an A300 airbus, was mistakenly identified as an Iranian Air Force F-14.

In the Joint Commander’s opinion, this was impossible. Authorisation for engagement had to be issued by the Saudi sector commander at Dhahran after USAF or Saudi AWACS had classified the Iraqi aircraft as hostile. If the MOD refused to accept this stipulation, the F3s would be unable to take part in integrated air defence operations. They might then be marginalised or grounded, or perhaps even asked to vacate ramp space at Dhahran, which was at a premium because of the huge US build-up. The only alternative was for the F3s to operate in an air defence zone of their own, but the Saudis were naturally unwilling to allow another nation’s aircraft to fly autonomously in their airspace. Harmonisation of the rules was thus imperative.

At the heart of the problem lay the twin issues of third-party identification and the criteria required before an aircraft could be classified as hostile. The caution underlying the UK ROE originated in concerns that US and Saudi AWACS might base their assessment of ‘hostility’ purely on the intruder’s geographical position. Although subsequent information suggested that the US, like the UK, required clear evidence of a hostile act or hostile intent, the MOD continued to suspect that an Iraqi aircraft could possibly be declared hostile purely because it had entered Saudi airspace. The Saudi AWACS crews were also thought to be less proficient than their American counterparts – a supposition that fuelled fears that a friendly or civilian aircraft might be mistaken for an Iraqi Air Force intruder.

The issues were complicated by discrepancies between the US ROE being reported to London from Washington and those being applied in the Gulf. It eventually transpired that the ROE approved in Washington were those appropriate to a period of tension whereas, in the Gulf itself, CENTAF was applying the ROE for war; yet both Washington and CENTAF thought they were working to the same rules. The Saudis, for their part, were unaware of the mixed messages emanating from the US and wrongly believed that London was entirely to blame for the deadlock. Considerable time and effort were required to resolve

this misunderstanding, which was a source of great frustration to the UK Defence Staff and their Saudi counterparts.

When the Chiefs of Staff met on 14 August, they received a gloomy assessment of the situation. The difficulties involved in framing acceptable ROE for the F3 detachment were proving insoluble and, in the absence of any agreement, they were not being tasked to fly on Combat Air Patrol (CAP). The Chiefs were invited to consider whether the UK should insist on maintaining national ROE and risk exclusion from air defence operations or accept US/Saudi procedures and the possibility of being committed to action on potentially dubious legal grounds. It was agreed that efforts should continue within the MOD to determine the US position on ROE, while the Air Commander liaised with his opposite numbers in US CENTCOM and the RSAF to determine US and Saudi intentions. 'Every effort should be made to align British ROE with those to be adopted by US/Saudi forces.'

Ultimately, the Chiefs of Staff conceded that the F3s had been sent to Saudi Arabia with excessively restrictive ROE. Ministers were advised that 'the identification and declaration of a target as hostile by a third party was acceptable in principle, provided agreement could be reached on what constituted the word "hostile".' A further stipulation preventing RAF aircraft from flying within 25 miles of the Iraqi, Kuwaiti, Jordanian and Yemeni borders was also revised, the 10-mile limit observed by the US and Saudi Arabia being instituted instead.

At the same time, the RAF reached the conclusion that JSP 398 was too restrictive, and several of its clauses were therefore amended. As one source at HQSTC put it:

ROE was drafted for dog-fight situation where pilot [was] required to manoeuvre into a restricted weapons envelope and to point the nose of his aircraft at the target; however, the high off-boresight capability of latest generation fighters means that shots can now be taken at all aspects ... As a result, the first shot may be taken at a much earlier opportunity than envisaged when JSP 398 [was] drafted, and there will be little need for persistent manoeuvring for the attacker to obtain a firing solution ... The more imminent prospect of hostilities has caused us to examine this ROE with a more critical eye and, as presently worded, it is incompatible with the pilot's right to take timely action in self-defence.

Meanwhile, the US authorities sought to clarify the position. By 18 August, the MOD had received a revised set of US ROE requiring that, before opening fire, US air forces should establish that an Iraqi aircraft had demonstrated intent to commit a hostile act. The rules also confirmed that, for aircraft, the US definition of hostile *intent* was broadly equivalent to the standard British definition of a hostile *act*. US forces did not have permission to engage Iraqi aircraft simply

because they had penetrated Saudi airspace. In other words, the US position was compatible with the basic principles underlying UK ROE for RAF detachments in the Gulf.

The American rules further disclosed that a range of exacting criteria had to be satisfied before an intruder could be declared hostile to US aircraft, including electronic interrogation, flight plan-position correlation, direction, course, speed and behaviour consistent with hostile intent, and activation of weapon system radar or electronic countermeasures. AWACS (backed by SIGINT and Electronic Intelligence (ELINT) from USAF RC-135s) was known to be more than capable of gathering the necessary information. Nevertheless, it was still necessary for the UK Air Commander to negotiate something of a compromise with his American and Saudi counterparts concerning the definition of hostile action, and the British understanding of what constituted a single, unitary, air formation had also to be revised.

With the compatibility of British and US definitions of 'hostile' firmly established, it was possible to insert a simple clause into ROE documents that effectively settled the issue:

The Air Commander has instituted procedures so that, of the tracks identified by third-party control agencies, only those which comply with the criteria for positive identification *and* hostile act are declared to UK units as having committed a hostile act.

As the UK Air Commander could not personally exercise his designated authority on a minute-to-minute basis, he briefed the RAF base commander and air defence commander at Dhahran to deputise. Either he or an officer of wing commander rank was to be present in the Dhahran air defence operations centre whenever RAF fighters were airborne. The Americans were to ensure that their AWACS controllers, particularly those on Saudi AWACS, were briefed on UK ROE, and RAF crews were directed to treat instructions to engage with a degree of caution. As an added safeguard, the UK Air Commander appointed a delegated air defence commander – another wing commander – at Riyadh to monitor air defence operations during any period on which he was unable to do so himself. This officer was to be present in the TACC whenever RAF F3s were on CAP and his task was to ensure strict adherence to UK ROE. He was delegated full authority for ROE matters in the UK Air Commander's absence.

Coalition ROE were by no means comprehensively aligned thereafter. Indeed, despite the apparent agreement on engagement criteria, the UK ROE still did not permit the F3s to fire on targets beyond visual range purely on the basis that they had been declared hostile by the on-task AWACS. Nevertheless, these arrangements provided a working compromise, which not only catered for the ROE relationship between the UK and her allies but also for that between the MOD and the UK Air Commander. In practice, this compromise was achieved

through a limited delegation of authority from London to specially appointed RAF personnel in Dhahran and Riyadh, who had effectively to judge each case on its merits. Beyond this, the F3 crews were also required to exercise exemplary knowledge and judgement in the application of UK ROE.

There were no further ROE problems of this magnitude during Operation Granby, but the rules had nevertheless to be reviewed on several occasions. For example, in December, there were signs that the Iraqis were preparing for a pre-emptive attack. To meet this contingency, CENTAF developed a so-called D-Day plan in which RAF offensive aircraft were involved, yet it transpired, when the plan was examined in London, that UK ROE would not permit RAF participation. The Joint Commander therefore proposed a number of changes to dormant ROE<sup>55</sup> and sought authorisation for himself and the BFCME to activate the dormant ROE in the event of the D-Day plan's implementation; the issue was soon resolved along these lines. Following the outbreak of hostilities in January 1991, a discrepancy between UK and US ROE caused a temporary halt in the involvement of RAF Jaguars in operations against Iraqi naval vessels, but their missions were resumed after the US Navy confirmed that all aircraft tasking would comply with British ROE requirements. On occasion, it was necessary for the UK Air Commander to hold up the red card to prevent RAF aircraft from attacking particular targets, but he would later record that 'when this happened, it was accepted without demur.'

The ROE issue illustrated again how, during Granby, the MOD could sometimes be insufficiently responsive to constantly changing circumstances in theatre. In the aftermath of the Cold War, it proved difficult to adjust to the tempo of live operations. Yet ROE can never be static in a developing crisis. They have to be continuously updated to reflect (and sometimes anticipate) the course of events. They are also not purely reactive: until the outbreak of hostilities, they provide one means of controlling the way in which a crisis develops and thus serve as an instrument of crisis management. To that extent, they represent a delegation of political authority and their adaptation may require ministerial action at very short notice. The ministerial machinery must therefore have the capacity to respond quickly and efficiently to ROE-related issues.

During December, the Joint Commander reached the conclusion that the MOD had been taking far too long to clear ROE requests submitted from theatre through JHQ and alerted CDS to the problem. With hostilities imminent, he argued, commanding officers had to be confident that ministers were aware of the critical importance of ROE. Moreover, it was vital for the Secretary of State or his nominated deputy to be immediately available so that ROE changes could be sanctioned without delay. It is not clear that there was any great improvement as a consequence of the Joint Commander's representations. Proposals to create an

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55. Dormant ROE are pre-approved ROE that do not become effective unless certain contingencies occur or certain operational milestones are passed.

ROE cell in the MOD's Joint Operations Centre were considered but not implemented. Fortunately, the difficulties that so concerned Air Chief Marshal Hine lost much of their significance following the launch of Desert Storm in January. The onset of live hostilities simplified many of the key issues and the ROE devised for this phase of Operation Granby had been very carefully considered in advance. They proved to be robust and easily applicable, and there was consequently little need for further alteration.

### **Aftermath**

In general, operational air C2 functioned smoothly during Granby. A number of complications inevitably arose during the early stages of the Gulf crisis, but they were soon resolved. The US component system allowed participating RAF detachments to be incorporated into the coalition with relative ease, leaving the UK Air Commander and his staff to exercise a supervisory, consultative and supporting role. Primary air C2 functions were executed by the Air Component Headquarters and the CAOC. A single UK command chain extended from the MOD to JHQ (supported by the FLCs) and to the JFHQ in theatre, where the JFC commanded the deployed UK land, air and maritime forces and represented all three on CINCCENTCOM's Component Commanders committee. The principle of unity of command was faithfully observed.

Nevertheless, a number of C2 issues attracted attention during and in the aftermath of the operation. Some commentators urged greater delegation from the MOD, although others would have preferred more direct MOD involvement. The Joint Headquarters system was not immediately reviewed; indeed, the Defence Staff at first expressed full confidence in the status quo.<sup>56</sup> Yet the MOD ultimately decided to establish PJHQ at Northwood. From the RAF's perspective, difficulties staffing both JHQ and the UK Air Headquarters with trained C2 personnel led to the overhaul of the Air Battle Management Course by the new AWC, and continuous No-Fly Zone operations in the Gulf and over the former Yugoslavia also allowed personnel to accrue more operational C2 experience. Yet it was increasingly considered that more far-reaching measures were necessary. A working group established by ACAS and the Assistant Chief of the Defence Staff (Operational Requirements (Air)) concluded in October 1994 that the UK's air C2 structure was fragmented, incomplete and inadequate for the coherent command and control of modern air warfare in a changing and unstable world. 'The absence of formed air C2 entities, and trained personnel to man them, capable of rapid deployment overseas to form the air component of a JFHQ, was seen as a major weakness.' The report went on to argue that the US JFACC concept had proved itself during the Gulf War and had since been embraced by NATO.

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56. CDS 3/92, Command and Control at the Higher Level, 12 May 1992.

The JFACC concept would also meet the UK's national needs and it would therefore be sensible for the RAF to adopt it, and to design the national deployable Air HQ (AHQ) to support it. Such an AHQ would have a staff element to support the JFACC, and an embedded Air Operations Centre (AOC) to plan and oversee the conduct of the battle ... The AOC should be termed a CAOC.<sup>57</sup>

The proposed CAOC structure envisaged the two basic divisions that typified US CAOC organisation at that time – Combat Plans and Combat Operations.

The Air Force Board Standing Committee approved these recommendations in the following year, and the UK CAOC finally came into existence in 1997. However, it was not at first tasked or equipped for deployed OOA operations and only developed a limited deployable capability through low-level initiative rather than higher command guidance. Instead, for deployed operations, it was still envisaged that a UK Air Headquarters would be established by the AOC 1 Group and his staff – effectively the same system used in Operation Granby. It was only in 1998 that a deployment requirement for the CAOC was confirmed by the AOC-in-C STC to support the UK's new Joint Rapid Deployment Force – subsequently replaced and substantially augmented by the Joint Rapid Reaction Force (JRRF) concept following the Labour government's SDR. SDR also identified the need to mount, on a unilateral basis, two concurrent medium-scale operations, one warfighting and one non-warfighting and envisaged the UK assuming a leadership role in coalition operations with other European forces.

HQSTC was now required to 'be able to deploy, at very short notice, responsive, coherent Composite Air Expeditionary Forces, commanded centrally at the tactical level through a JFACC'. A Concept of Operations (CONOPS) for a deployable UK JFACHQ was in one-star circulation by March 1999 but without any indication of how the additional resources required for the new organisation would be found.<sup>58</sup>

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57. CAS 9/1 Pt A, Future Command and Control of Air Power – Final Report of the ACAS and ACDS OR (Air) Working Group, 6 October 1994.

58. Wing Commander Redvers T.N. Thompson, 'Post-Cold War Development of United Kingdom Joint Air Command and Control Capability', *Royal Air Force Air Power Review* (Winter, 2004), p. 78.

## **OPERATION ALLIED FORCE: KOSOVO, 1999<sup>59</sup>**

On 24 March 1999, NATO launched Operation Allied Force (UK air operations were mounted as Operation Engadine) against the Federal Republic of Yugoslavia (FRY) in response to the actions of the FRY security forces in the southern Serbian province of Kosovo. It was the first live military action to be conducted entirely under NATO auspices since the creation of the alliance in 1949. Well before the operation was launched, there was broad agreement across NATO that ground forces would not be sent into Kosovo in non-permissive circumstances. Allied Force would be conducted entirely from the air.

Two and a half months later, on 10 June, the campaign was suspended after the FRY's president, Slobodan Milosevic, agreed to withdraw his troops from Kosovo and satisfy a range of other requirements laid down by the international community for ending the conflict. By that time, many Kosovo Albanians had been subjected to appalling human rights violations in a process similar to the ethnic cleansing previously witnessed in Bosnia. Hundreds of thousands had fled to refugee camps in Albania and Macedonia to escape the Yugoslav Army (VJ), military police (MUP) and paramilitaries; in their absence, many of their homes were looted and destroyed.

In the same period, NATO bombing extensively degraded the FRY's military and economic infrastructure. Military installations, command and control facilities, fuel storage centres and power-generation plants were demolished; communications links were severed; the FRY's air force lost one quarter of its military aircraft and one third of the most advanced aircraft in its inventory; ground forces in Kosovo were subjected to relentless harassment from the air and their combat capability was significantly reduced. To achieve this, NATO aircraft flew some 38,004 sorties of which 10,484 were offensive sorties. The UK contributed 1,618 sorties to NATO's total, 1,008 of which were offensive sorties. The offensive sortie rate increased from between 50 and 100 per day in the first week of the campaign to an average of more than 280 per day in the week preceding the start of peace negotiations in June. Ultimately, air power and sustained diplomatic pressure combined to deliver victory to NATO, but the arduous and protracted nature of the campaign raised many complex questions about the effectiveness of alliance air command and control.

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59. Unless otherwise stated, this chapter is based on the unpublished AHB narrative *The Royal Air Force in Operation Allied Force, Kosovo 1999*. The coalition name Allied Force has been employed throughout as the C2 issues considered here extend beyond the parameters suggested by the UK operation name Kingower.

## Air C2 and the Launch of Allied Force

The command and control arrangements for Allied Force could hardly have been more different from those employed during Operation Granby. There was no formal system of coalition components and national contingents, nor were there any co-located headquarters, whereas the key Granby headquarters were positioned at Riyadh. Moreover, as a ground offensive had been ruled out, there was no obvious reason to establish a Land Component headquarters or a JHQ. Instead, in theory at least, the NATO command chain for a southern region air operation was used. Under this system, on SACEUR's behalf, Allied Force should have been commanded by NATO's Commander-in-Chief Allied Forces Southern Europe (CINCSOUTH), Admiral James Ellis, who also functioned as the commander of US Joint Task Force Noble Anvil – the task force committed to operations over Kosovo. From Ellis, in Naples, the formal command chain ran down to the Commander Allied Air Forces Southern Europe (COMAIRSOUTH), Lieutenant General Mike Short, the CFACC, and then to the Italian Commander Fifth Allied Tactical Air Force (COMFIVEATAF) and the CAOC at Vicenza, Italy.

However, the reality was very different. In practice, SACEUR – US Army General Wesley Clark, based at Mons, Belgium – largely bypassed CINCSOUTH and worked directly down to COMAIRSOUTH and the CAOC. Perversely, COMAIRSOUTH then observed the correct channels by working back up to CINCSOUTH. The relationship between SACUER, CJTF/CINCSOUTH and CFACC/COMAIRSOUTH was described as 'doctrinally incoherent' in one RAF report. 'It was not clear who was responsible for what, and the accepted boundaries of responsibilities between the levels of warfare were frequently compromised.' The preponderant American role in Allied Force also allowed senior US officers from beyond NATO's southern command chain to exert influence, such as the Commander of USAF forces in Europe (COMUSAFE, based at Ramstein, Germany), who also functioned as NATO's COMAIRCENT.

As for the CAOC, it was substantially an American creation established earlier in the decade because COMFIVEATAF lacked the means to exercise effective C2 of operations on the scale of Deny Flight – the No-Fly Zone over the former Yugoslavia. It functioned under the direct command of COMAIRSOUTH rather than COMFIVEATAF, and was already serving as a combined air headquarters and air operations centre before Lieutenant General Short chose to locate himself there (rather than at AFSOUTH headquarters Naples) in 1998.<sup>60</sup>

SACEUR was answerable to the North Atlantic Council but was also in close contact with the United States Joint Chiefs of Staff throughout the

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60. Bradley S. Davis, 'The Planning Background', in Robert C. Owen, *Deliberate Force: A Case Study in Effective Air Campaigning* (Air University Press, Maxwell Air Force Base, Alabama, 2000), p. 48.

campaign. This pressure from above was one factor in his tendency to circumvent the established command channels. He was also inclined towards an interventionist approach to high command, and his tendency to micromanage was encouraged by a new development – the provision of a live Predator video feed from Serbian airspace directly into his Mons headquarters. Nevertheless, the shorter command chain was also undoubtedly favoured because it was substantially an American chain. With the US providing the vast majority of aircraft committed to Allied Force, it was perhaps inevitable that there should have been a reluctance to delegate higher command functions to other NATO countries, and there were concerns about operational security within the alliance that persisted throughout the campaign.

In 1998, when it first became clear that military intervention in Kosovo might be necessary, the UK was maintaining a limited RAF presence in theatre under the auspices of Operation Deliberate Forge, the continuing international operation to support the Dayton peace settlement in Bosnia-Herzegovina. The RAF elements committed to Deliberate Forge came under a National Contingent Commander (NCC), the Commander British Forces Italy (Air) (CBFI(A)), an officer of group captain rank, who functioned as the UK Senior National Representative (SNR) in the CAOC. All the National Contingent Commanders sat outside the formal CAOC structure in independent National Contingency Commanders Cells, supported by their staffs. In the British case, the CBFI(A)'s staff was referred to as the Vicenza Detachment.

Describing the build-up to hostilities, the CBFI(A) would later record that all six departments within the CAOC were under the command of US officers and that much of the planning and targeting information was supplied through US-only channels. Two separate ATOs were generated, one for the more sensitive US assets.

Planning is usually done by US-only staff and only when planning has been completed is it released to SNRs for comment. On a number of occasions, the first time we have been exposed to a plan is when it is being briefed to General Short for endorsement. During the preparation for operations in Feb 99, the US moved a large number of planning and targeting functions into the US NIC [National Intelligence Centre] and had prepared 2 separate Air Tasking Orders (ATOs), one of which was only releasable to US personnel ... SNRs were rarely consulted at the concept stage and had little influence over the apportionment of assets and the development of the overall plan.

He also described how the NIC had shown 'a marked reluctance to release *any* information to non-US personnel' and how he was 'expressly forbidden to even approach the US NIC' throughout his tour (which ended just before the operation

started). Staffs tended to rely heavily on US CIS, such as SIPRNET,<sup>61</sup> which was not accessible to non-US nationals, and this allegedly delayed or even prevented the dissemination of key guidance. The Combined Targeting Coordination Board (CTCB – also referred to above as the JTCB), was likewise entirely American in composition. It was thus extremely difficult, if not impossible, for the UK to influence campaign planning at this stage, and there was much uncertainty in British circles about Allied Force's precise objectives and the means by which they were to be achieved.

Ostensibly, NATO's three-phase air plan aimed to turn a coercive screw on the FRY, exerting steadily increasing pressure. If Phases 1 and 2 failed to achieve FRY compliance, the air campaign would be broadened in scope under Phase 3. The Phases were defined by their objectives, target sets and geographical areas. Phase 1, the primary coercive campaign, attached top priority to the destruction of the FRY's Integrated Air Defence System (IADS): out of 51 targets in Phase 1, 44 were IADS-related. Tactical manned aircraft and non-stealth aircraft involved in Phase 2 were to attack military targets (command and control centres, lines of communication, hostile forces, operations and logistics sites) south of 44°N. Phase 3 extended the campaign throughout the FRY with the aim of 'creating a situation whereby Belgrade ceases to command, control, communicate and sustain military operations in Kosovo'.

Target sets were selected by the CAOC and were then considered by the CTCB at the CJTF/CINCSOUTH level. Once the operation had been launched, there were many categories of military target that could be approved by the CFACC through delegation processes similar to those employed in the Gulf. However, before the outbreak of hostilities, a high proportion of targets required North Atlantic Council (NAC) clearance, and close NAC control of more sensitive target groups continued for the entirety of Allied Force.

Phase 1 was intended to last for two nights, but the time-scales set for the operation were otherwise vague. One British document records that SACEUR envisaged a campaign of between three and seven days with a possible pause after the third day; another refers to a longer timetable of 28 days. As late as 21 March, only Phase 1 had been planned in detail. The Assistant Chief of Staff Operations (ACOS J3) at PJHQ noted that 'The latter phases require further work.' The next day, General Shelton, the US Chairman of the Joint Chiefs of Staff (CJCS), professed himself ignorant of the Phase 2 targets during a conversation with CDS: 'He had not yet seen the plan.' Such an absence of clarity during the planning process did not bode well for the operation itself. Among other things, it rendered the preparation of a valid Air Estimate all but impossible.

The operation suffered from a number of handicaps from the very outset. First, between inception and implementation, Allied Force was heavily watered down. The Master Target List agreed by the CTCB included only some of the

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61. SIPRNET, the Secret Internet Protocol Router Network, was the main US intelligence CIS.

CAOC's recommendations. For example, out of sixteen bridges identified as critical to the tactical movement of FRY forces, only eight were initially approved; the status of the remainder was left open to question. Other targets were withdrawn from the list by the NAC on legal or political grounds or were deferred pending further consideration. Of 159 targets on the Master Target List on 21 March 1999, only 115 had been cleared by the NAC. It would subsequently prove impossible to progress from Phase 2 to Phase 3 of Allied Force because certain allies were reluctant to approve the necessary extension of targeting, and an intermediary stage, Phase 2 Plus, was adopted instead.

Second, a very high priority was attached to force protection. It was reasoned that significant losses would undermine domestic support for the air campaign, which might then disintegrate completely, with dire implications for the future of NATO. Serbia, unlike Bosnia, was protected by a highly capable IADS, which included an air force equipped with MiG 29s, an advanced air defence radar network, surface-to-air missiles (SAMs) such as mobile SAM 6s, and man-portable air defence systems (MANPADs). For NATO, this placed a premium on the availability of SEAD assets, which were severely stretched.

A proportion of NATO's offensive force was therefore diverted to SEAD. At the beginning of Operation Allied Force, a typical 'package' comprised 16 aircraft in the SEAD, CAP/fighter sweep and lookout roles, and 16 bombers. Even then, SEAD 'windows' – the periods when the attacking aircraft were protected by SEAD measures – tended to be short. Hence, the bombers could only remain in their target areas for a limited time, during which a range of other factors might prevent them from releasing weapons and cause sorties to be aborted altogether. As a further measure of force protection, the US insisted on an absolute lower operational flying limit of 15,000ft, an altitude from which smaller targets were extremely difficult to identify with the surveillance capabilities and targeting pods then available. An early observation on Allied Force by CAS, Air Chief Marshal Sir Richard Johns, was that 'The enforcement of altitude ceilings to reduce significantly the threat to Allied aircraft, has clearly limited both its effectiveness and to some extent its credibility.'

Third, Operation Allied Force was constantly hampered by overcast weather conditions. Flying at medium altitude, aircraft were far less vulnerable to Ground-Based Air Defences than they were at lower levels, but there was more scope for missions to be disrupted by cloud cover. Cloudy conditions and poor visibility over Kosovo caused many offensive sorties to be aborted in the air or on the ground, complicated the task of air reconnaissance, target location and BDA, and often prevented Laser-Guided Bombs (LGBs) and other munitions from being employed altogether.

Operation Allied Force opened with an attack on the FRY IADS. On the first day of the campaign, some 400 aircraft from thirteen NATO air forces were involved, and 40 locations were targeted. The intention was to establish air superiority over Kosovo and southern Serbia as the essential prerequisite to the

second and third phases of the campaign plan. The FRY responded by breaking off diplomatic relations with the leading NATO powers, declaring an internal state of war and unleashing the full force of the VJ and MUP against the Kosovo Albanian population. During the following days, as cloudy weather disrupted the introduction of Phase 2, the tempo of ethnic cleansing in Kosovo was dramatically increased. The Kosovo Albanians were driven from towns and villages in the north and west, which were looted and set on fire. In the face of this indiscriminate and barbaric assault, an enormous tide of refugees abandoned Kosovo for the safety of neighbouring Albania and Macedonia: approximately 440,000 people, one quarter of the total population, left between 29 March and 6 April alone. By 12 April, the FRY campaign had displaced 1.3 million Kosovo Albanians out of a total population of 1.8 million.

Many observers had anticipated this eventuality. Nevertheless, the reaction of individual NATO members suggests that they originally expected Allied Force to achieve their goals almost immediately – a degree of over-optimism based on the perceived role of air power in ending the war in Bosnia-Herzegovina. In Washington, the State Department is said to have been ‘baffled’ by the turn of events in Kosovo. In London, a ministerial meeting on the crisis convened as early as 29 March reached the conclusion that ‘The air campaign has so far been less successful than predicted.’ In other words, it had failed, in just six days, to coerce Milosevic into accepting the demands of the international community.

Unfortunately, Allied Force was not supported by a contingency plan – a clear alternative operational concept – that might have been pursued if Milosevic refused to succumb to the initial air strikes, or if he responded by retaliating against the Kosovo Albanians. A so-called ‘Response Option’ had been prepared, the response being ‘to Serb aggression in Kosovo’, but it added only 21 additional targets to the phased air operation. Phases 2 and 3 of the air campaign were aimed at general FRY military capability – infrastructure, command and control, communications, supplies and storage.

The absence of detailed contingency planning (together with the limitations of the Allied Force target list) helped the FRY to seize the initiative in Kosovo and shape profoundly the subsequent course of air operations. The alliance found itself under immediate political pressure to protect the Kosovo Albanians by directly targeting fielded VJ and MUP forces. On 27 March, the Secretary General of NATO, Javier Solana, consulted member governments and found them unanimously of the opinion that the air campaign should strike FRY units in the so-called Kosovo Engagement Zone (KEZ), and it was then publicly announced that the focus of the campaign was being broadened to incorporate such targets. To SACEUR and D/SACEUR, both Army officers, this reorientation appeared straightforward and possibly even welcome from a doctrinal perspective: tactical air power was more easily understood than coercive air power. But the new task was contemplated by senior air officers with very little optimism or enthusiasm.

## **The Debate on Targeting**

Over the next two weeks, NATO's commitment to Allied Force increased from (in round figures) 400 to 600 aircraft, and operations were gradually intensified. Nevertheless, overcast weather, airspace restrictions and the limited availability of SEAD and AAR conspired to reduce the daily sortie rate to an average of 385 during the first 40 days of the operation. Within this total, the average number of attack sorties was just 101 and the number of aircraft that actually released weapons was lower still. It was therefore essential to maximise the impact of every strike.

Against this background, a debate emerged on the orientation of the air campaign: it was suggested in some quarters that many missions were in fact being wasted. According to this view, the campaign's focus had shifted too far towards KEZ operations, which offered a very poor return in relation to the effort expended. It was too difficult to locate legitimate targets, and the destruction of such targets as could be found did not always contribute very much to NATO's operational objectives.

The problem was graphically illustrated in a briefing prepared by the CAOC entitled 'Cost of doing KEZ business.' This document maintained that a high proportion of Allied Force sorties undertaken by multi-mission-capable aircraft took the form of CAS-type missions for which such aircraft were not optimised. This resulted in a sortie rate of 14.1 per target destroyed, which 'indicates a very lengthy period of prosecution in Kosovo to achieve acceptable levels of target reduction'. Per sortie, CAS-optimised aircraft were destroying twice as many targets as multi-mission aircraft, yet multi-mission aircraft were flying more than twice as many sorties as CAS-optimised aircraft. Generally, the dispersal of FRY forces ensured that missions in the KEZ offered minimal reward. Only 51 per cent of those assigned to the KEZ were actually directed on to a target, leaving the remainder to find back-up targets that had 'little or no effect on the VJ/MUP forces in the field'.

In the UK, PJHQ passed the CAOC's assessment of KEZ operations to CAS. Their summary concluded: 'An enormous number of sorties have been tasked in this manner – with little effect.' In turn, CAS alerted CDS. In reviewing the progress of the air campaign, he pointed out that the original phased plan had not been followed. 'Once the extent and ferocity of ethnic cleansing became apparent, SACEUR directed that the primary weight of effort was to be targeted against VJ/MUP units in Kosovo. This has detracted from operations in Serbia.' KEZ operations were, he argued, 'an inefficient use of some aircraft types ... [and] a diversion of scarce resources ... from where they are really needed'. Quite independently, the Chief of Defence Intelligence (CDI) was presenting a very similar picture in a summary submitted to the Prime Minister through the Secretary of State for Defence.



Air Chief Marshal Sir Richard Johns, Chief of the Air Staff during Operation Allied Force.

To these pessimistic assessments were soon added more general concerns about the strategic direction of the air campaign and particularly about SACEUR himself. The essence of the problem was vividly demonstrated at a meeting of NATO chiefs of staff on 15 April, where SACEUR declared that the air campaign was 'progressing methodically'. CDS subsequently pressed him on this point, asking him to explain the pattern of his air campaign strategy. 'It was hard to understand what were his priorities.' This was a pre-arranged question agreed between the two generals over the telephone the previous day. Nevertheless, General Clark's response can only be considered unconvincing and must have revealed to all those present that the air campaign's progress was anything but methodical. He stated that it was 'hard to explain an air strategy from a simple target list'. His priorities were IADS, ground forces, isolation of forces in Kosovo and higher command and control, but there were many different potential aim points within these target categories. 'The result was always a mosaic of activity, not a linear strategy.'

The assembled chiefs were left to draw their own conclusions, and they were far from positive. At a meeting of the British Chiefs of Staff on 19 April, CAS declared bluntly that 'At present, the enemy's strategic and operational centre of gravity had not been defined and there were no time-lines and no target prioritisation.' In the subsequent discussion, it was added that 'the Air Campaign up until now had not been aligned to political activity' and that SACEUR had been frustrating the targeting effort. The USAF took a similar view. When CAS attended a conference of Central Region Air Chiefs on 22 April, he sensed

a very real feeling of frustration from his US Counterpart and COMUSAFE, and also their concerns about SACEUR's conduct of operations ... It was generally considered that SACEUR's concentration of effort on fielded forces in Kosovo for the last two weeks and occasional targets described as being of "unique strategic value" had led to a most inefficient utilisation of NATO air assets.

Yet SACEUR's focus on the KEZ was by no means the only difficulty. The truth is that NATO's air C2 structures were also poorly prepared for the task that confronted them by April 1999. While the existing CAOC was capable of directing a limited number of air strikes against a relatively small list of pre-planned targets, it did not have the capacity to manage a very much larger and more intensive air campaign against an infinitely more varied and dynamic target array that included 'time-sensitive' targets. For this purpose, a fully-fledged ACHQ was needed; it took more than a month to establish. In the meantime, several vital campaign management components remained largely absent. The RAF afterwards reported that 'clear targeting guidance was not available to targeteers until day 47 of5 the campaign.' Before that, production of the JPITL –

a normal air headquarters function – was controlled by the JTF HQ at Naples. Furthermore, such critical processes as Strategy (Strat) and GAT were neglected. The expansion of the CAOC into an operational level ACHQ has been described as ‘a case study in ad-hoc crisis management ... Across the whole range of HQ staff cells (A1-A9), augmentees were being thrown together, often without cadre personnel or identified procedures to follow.’<sup>62</sup>

The number of staff at Vicenza was ultimately enlarged from 400 to more than 1,300 in an attempt to meet the challenge, but virtually all the after-action reports record that the headquarters struggled to master the basic targeting cycle – from the identification of the target through to the air attack against it – in a sufficiently timely manner. The so-called sensor-to-shooter link was too slow. The involvement of numerous external entities in the targeting process, including higher approval authorities and higher headquarters targeting staffs and intelligence centres, was partly to blame. It was also observed that up-to-date BDA had rarely been available in time to influence the air tasking process, so that missions were often launched against targets that had already been destroyed.

When Strat and GAT machinery was established, RAF personnel were appointed to certain pivotal positions in the two cells and played an influential role in persuading the CFACC to adopt a long-term campaign strategy. This took the form of his Strategy and Mission Statement, in which he proposed to redress the balance between KEZ and other operations by focusing far more bombing effort on military and strategic targets in Serbia. Only CAS-optimised aircraft would be employed in the KEZ, multi-mission aircraft being freed for more effective use against other key target sets. At the same time, the CFACC assumed responsibility for producing the JPITL for JTF approval.

At the strategic level, Short’s plan envisaged that the air campaign would destroy enemy forces in Kosovo, degrade the FRY’s military capability, and bring pressure to bear on Milosevic and his government. This would involve the isolation and destruction of VJ/MUP capability and forces in Kosovo *and* Serbia, attacks on locations of value to the FRY leadership and the maintenance of air superiority. The plan was designed to take full advantage of additional aircraft being committed to the campaign by increasing the weight of effort devoted to strategic and military targets in Serbia while maintaining the intensity of operations against the VJ and MUP in Kosovo and was accompanied by specific proposals for improving the utilisation of airspace and AAR assets. It was approved by CINCSOUTH on 29 April – in accordance with NATO’s formal command and control structure – and implemented on 2 May. In the UK, the Air Staff pinned its hopes on this twin-track or ‘parallel’ strategy. It was by no means perfect. Key shortcomings of the campaign to date – the failure to identify centres of gravity, the absence of timelines and targeting priorities – were not fully

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62. Thompson, ‘Post-Cold War Development of United Kingdom Joint Air Command and Control Capability’, p. 76.

addressed; but it nevertheless seemed to represent a pronounced improvement and won the Air Staff's support on that basis.

However, successful implementation of the plan was dependent on SACEUR's enthusiastic collaboration and NATO's willingness to approve more attacks on strategic targets in Serbia. At the alliance's 50th anniversary summit in Washington between 23 and 25 April, CDS and the CJCS discussed SACEUR's approach to the campaign and decided that an intermediary might profitably raise their concerns directly with him. They entrusted this unenviable task to CAS.

CAS's brief stated that the 'ostensible reason' for seeing SACEUR was to 'advise him on the strategic direction of an air campaign and the associated planning', but it acknowledged that, in reality, there were plenty of people in NATO who could supply this guidance. 'The real issue' was said to be 'SACEUR himself, and the extent to which he will allow the campaign to be planned and executed without interference or micro-management'. CAS was to emphasise the UK's desire to help SACEUR but also the need to achieve a broader understanding of his strategy. In other words, what were the FRY's centres of gravity and how could they be targeted most effectively? If such issues could be clarified throughout the NATO command chain, SACEUR could then leave his subordinates to 'get on with the job'. CAS was also to confirm UK support for the CFACC's 'parallel' strategy and urge on SACEUR the need for both concentration of force and economy of effort in planning the air campaign.

At the meeting itself, SACEUR implicitly accepted General Short's Strategy and Mission Statement but left CAS with the impression that he still favoured strikes against VJ and MUP forces in Kosovo. He identified priority target categories that, in CAS's view, contained too many individual targets and so promised to disperse and dissipate the bombing effort, and he refused to accept that time-lines were necessary for the air campaign, arguing that adverse weather conditions might not permit their achievement. SACEUR subsequently appeared ready to redirect the air campaign towards strategic targets in Serbia. To the 'QUINT' chiefs of staff (from the US, UK, France, Germany and Italy), he expressed a desire to attack power-generation facilities and industries owned by Milosevic's close associates, and to extend strikes on the state-run media. He also left CDS with the impression that targeting priorities were being considered far more carefully than before.

Yet both London and Washington continued to question his ability to deploy NATO air forces to optimal effect, and similar doubts remained at lower alliance command levels. At a conference at Ramstein, CAS heard from a CAOC representative that there remained a fundamental divergence of opinion between SACEUR and the CFACC. 'SACEUR was preoccupied with KES operations. Short was far more concerned with targets in Serbia.' As late as 12 May, SACEUR issued a memorandum on strategic guidance to Admiral Ellis stating:

My highest priority is the attack of ground forces in Kosovo. All other target sets rank as lower priorities than this ... Your top priority must be to develop the [KEZ] targets and pour on the resources to the maximum extent possible.

If such pronouncements held out little hope that the air campaign might be redirected towards Serbia, the posture of certain NATO allies, particularly the French, presented a further obstacle. Theoretically, the Secretary General of NATO could approve new targets on his own authority, but his power to do so was heavily circumscribed in practice. The way in which target authorisation procedures impeded the introduction of Phase 3 of the air campaign has already been described. The agreed compromise – Phase 2 Plus – failed to address key targeting areas, such as FRY television (Milosevic's most important domestic propaganda organ) and substantial parts of the military-industrial complex. And yet, when a NATO military spokesman made an unscheduled public announcement to the effect that FRY television was a legitimate target, he caused such a furore that the alliance's chief spokesman had to deny the very next day that there were plans to target television stations directly. After this, Solana was understandably cautious about sanctioning targets himself. The alternative of referring them to the NAC for clearance was inevitably accompanied by considerable delay.

The particular difficulty with France over targeting arose in the middle of April, coinciding exactly with the mounting critique of KEZ operations and with General Short's proposals for striking more targets in Serbia. On the 14th, the US Secretary of Defence, William Cohen, held a secure conference call with his British, French and Italian counterparts and urged them to move to Phase 3 and withdraw their objections to specific targets. The UK Secretary of State for Defence was in general agreement, but the French defence minister, Mr Richard, emphasised France's preference 'to intensify air strikes against military targets in Kosovo' because 'they believed this would be the quickest means to achieve NATO's objectives. France would have reservations on specific targets in Belgrade and other purely economic targets because of the impact on public opinion. On the same day, President Clinton told the Prime Minister:

We would not be doing serious harm to Milosevic unless we moved on to Phase 3. We need to hit presidential facilities, the Socialist Party headquarters including their radio and TV stations, power plants etc ... But we could not do so unless President Chirac removed his blockage to extending targets.

When NATO's Military Committee met on the 15th, SACEUR likewise informed the various chiefs of staff that he needed authorisation for these targets, and the Chairman of the Military Committee (CMC), General Klaus Naumann,

concluded that it was necessary to lift remaining restrictions on Phase 2 Plus target categories and to 'consider moving to Phase 3-type targets very soon'. However, when CDS passed on these conclusions to his French counterpart, General Kelche, the next day, he found him unenthusiastic. Kelche 'had problems with targets that were high-level political or economic in nature and not directly linked to Milosevic's military capability'. He avoided discussion of any specific targets, stating only that 'he would have no difficulty [gaining approval for targets] provided they could be shown to be military in nature and not political.' The French were also unhappy about striking industrial, economic and power-generation facilities.

These were complex and emotive issues. The Geneva Protocols effectively prohibit military action against non-military objects, but many targets in Serbia had a dual use. Like all their NATO counterparts, French ministers feared the domestic political repercussions of civilian casualties in the FRY, but other considerations also led them to emphasise the distinction between military and non-military targets with particular clarity. President Chirac believed strongly – rightly as events turned out – that the Kosovo crisis could only be resolved with Russian co-operation. He was convinced that a more strategically focused air campaign, perhaps accompanied by more collateral damage, would alienate Russia and jeopardise any prospect of her involvement in diplomatic initiatives with the FRY. In conversation with the Prime Minister on 20 April, Chirac accepted the need to broaden the range of targets but insisted that it was not useful to talk of Phase 3. 'This simply provoked Russia to no advantage.'

During the second half of April, the British and American governments wrestled to overcome France's aversion to strategic targets, and President Chirac's agreement 'in principle' to a new Phase 2 Plus is recorded in the documents as early as 19 April. The plan included the FRY media, symbols of the regime, Milosevic's residencies and his party headquarters, economic targets necessary in terms of NATO's military aims, and lines of communication. But principles and practices did not entirely correspond to one another. Hence, the White House found cause to complain only a few days later about continuing constraints on targeting that had to be removed. 'Chirac needed to be persuaded to give wider authority, within agreed parameters, to the NATO commanders.'

At the Washington summit, the Prime Minister and President Clinton held further discussions about target clearance with Mr Chirac, and Mr Richard afterwards reported to the Secretary of State for Defence that 'France had now given its agreement to all target categories identified by SACEUR with the exception of naval forces.' There was certainly some movement in the French position. Nevertheless, if the UK and US concluded that NATO's targeting problems were over, they were soon to be disappointed. As ACAS put it, 'When the PM or Clinton talk to Chirac, the latter says there is no problem and this is reflected in the subsequent Diptels [diplomatic telegrams]. But when NATO tries to clear targets, they still run into difficulties.'

CDS himself arranged a meeting with General Kelche on 29 April. He was ‘prepared to take him head on, on the issue of targeting’ and ‘was spoiling for a fight with the French over this’. But Kelche effectively washed his hands of the issue when they met, laying the blame entirely on Mr Chirac. CDS duly reported back to General Shelton, and they agreed that there was little more that could be done for the time being, while Chirac’s view was unchanged and he was personally engaged. ‘The French position had moved in the right direction, albeit painfully slowly, and the present situation was acceptable if not ideal.’

The air campaign’s results by the beginning of May were by no means unimpressive. CDI’s regular campaign analysis noted on the 10th:

The Air Campaign has achieved ... (a) damage to, and suppression of, the FRY Integrated Air Defence System (IADS), functional destruction of FRY oil refining capability and moderate damage to fuel storage capacity, disruption of lines of communication and the continuing isolation of the VJ in Kosovo.

b) Civil and military communications networks have been disrupted. The civil system is under severe strain in an effort to cope with increased demand over a reduced capacity.

c) The civil and military infrastructure supporting the VJ/MUP has also been attacked and significantly damaged.

d) The VJ and the MUP, though they have yet to suffer significant casualties, are finding it harder to operate as the progressive route denial affects resupply.

The battle damage inflicted on the FRY encompassed 85 combat and other military aircraft, including around a quarter of the MiG-29 and MiG-21 fleets, and 10 strategic-level SAM radar systems (24 per cent of the total); 9 of 17 militarily important airfields had been damaged, some severely, both the FRY’s oil refineries had been functionally destroyed, and many fuel storage facilities had also been destroyed or severely damaged, along with 35 road or rail bridges. The rail lines and high-capacity road routes into Kosovo had been cut, and some 48 out of 145 fixed communications sites attacked, including 95 per cent of the 19 key military sites between Belgrade and Southern Serbia. Military infrastructure – barracks, ammunition storage sites – had repeatedly been targeted with success, and it was assessed that the military capability of the VJ and MUP in Kosovo was gradually being weakened.

This relentless and intensifying bombardment, which was accompanied by a range of economic sanctions, inevitably began to undermine the resolve of the FRY’s political and military leadership. NATO governments may have gambled

unsuccessfully on Milosevic's will to fight at the beginning of the operation, but it is probably also true to say that he gambled on NATO's, mistakenly believing that the alliance would prove insufficiently determined and cohesive to sustain a protracted campaign. But, if anything, NATO appeared more united and robust in its support for Operation Allied Force after more than a month of hostilities than it had been in March, and the air campaign was inflicting increasingly severe damage on the FRY armed forces, infrastructure and economy, while hardly any of the attacking NATO aircraft had been brought down. Milosevic and his government were almost completely isolated in the international arena and were confronted by overwhelming military odds.

The first clear evidence that the air campaign was causing serious alarm at the highest governmental and military levels in the FRY was detected at the beginning of May, when there was a sudden and pronounced increase in GBAD activity. The reasons were soon identified. The FRY Air Force (responsible for GBAD) had been severely reprimanded for its failure to protect ground forces in Kosovo and for the relative impunity with which NATO aircraft were flying in the main theatre of operations. On 6 May, a ministerial meeting in London heard intelligence suggesting 'a step change downwards in Yugoslav morale'.

Soon afterwards, on the 10th, Belgrade announced a partial withdrawal of troops from Kosovo. Although, predictably enough, no pull-back actually occurred, the announcement was transparently designed to halt – or at least pause – Operation Allied Force and was interpreted by NATO as a sign of weakness. During the following week, reports began to reach NATO of anti-war and anti-conscription demonstrations in several Serbian towns, of declining morale and some desertions among fielded forces in Kosovo, and of acute difficulties in the recruitment of additional troops. Opposition leaders and some local dignitaries became more vocal in their criticism of the war.

Nevertheless, the air campaign's achievements still failed to match expectations and continued to disappoint the many senior NATO airmen who believed that resources could be employed more efficiently and effectively. A further briefing document prepared by General Short's staff on 22 May recorded that, notwithstanding the approved Strategy and Mission Statement, SACEUR's guidance remained focused on Kosovo.

COMJTF's apportionment for the first phase of the [revised] strategy directed that 15-30% of offensive effort be assigned to degrading VJ/MUP forces in Kosovo. However, following the strategy's implementation on 2 May 99, allocation of sorties to KEZ CAS did not change and has remained relatively constant at 40-50% of offensive potential.

The confirmed 'kill' rate inflicted on VJ and MUP tanks, armoured personnel carriers, artillery and trucks in Kosovo had increased in the second month of the

campaign but still only amounted to an average of just 6.6 pieces per day and was not expected to rise further. The brief then reiterated the arguments that had been presented by the CAOC in April.

In terms of 'hard kills' against VJ/MUP capability in Kosovo, the return from KEZ ops is demonstrably poor for the significant levels of effort that have, and continue to be, expended. To date, nearly 60% of ALLIED FORCE's offensive effort has been expended in this inefficient application of air power in Kosovo ... The capability of VJ and MUP forces to engage in combat operations against Kosovars or NATO ... remains substantially intact. While valuable military and police facilities have been damaged, VJ/MUP casualties to date have been light, and little combat equipment has been destroyed.

Accordingly, it was forecast that another two months would be required to prevent the Serbian security forces from conducting offensive operations in Kosovo. A further *four* months of bombing would be needed to prepare the Kosovo battlespace for an opposed ground campaign by NATO (in the event of such a strategy being adopted).

The AOC-in-C STC, Air Chief Marshal Sir Peter Squire, met with Lieutenant General Short at about this time. According to Squire, Short's 'remarks throughout were forthright and revealed an enormous degree of frustration and some anger'. He denied that air power had ever been given a chance to prove itself during Operation Allied Force and complained that NATO had no conviction and no strategic plan. In his opinion, there should not have been any restriction on the use of air power from the first night of the operation; it should have been employed in an overwhelming manner to destroy Milosevic's centres of gravity. Short subsequently 'described in graphic detail SACEUR's fixation on attacking fielded forces but without a strategy'. The air campaign had been little more than a normal flying programme in which targets were chosen at random and not according to a deliberate plan. However, in proposing to Squire that General Clark should threaten resignation if the NAC refused to endorse an unrestricted bombing campaign, Short also now implicitly acknowledged that SACEUR was himself responding to political pressures over which he had little or no influence.

Many of Short's opinions were undoubtedly justified, if politically unrealistic. Assuming the CAOC's statistics were accurate, KEZ operations continued to represent an extremely slow and uneconomic means of prosecuting the air campaign. And yet the campaign was showing some limited signs of success. At a meeting with SACEUR on 22 May, Short used precisely this point to maximum advantage. He argued that while some marginal tactical benefit was being attained from KEZ missions, these limited gains did not warrant the level

of effort expended; moreover, there was no evidence that KEZ operations were producing any coercive effect on the FRY leadership. However, as there were signs that Milosevic was coming under pressure and criticism in Serbia, other lines of attack were clearly exerting some coercive impact, and these should be intensified. Short then proposed what was described as a 'new' course of action; in reality, it was merely a second rendition of the 'parallel' strategy proposed in April.

An air campaign will be conducted using parallel attacks against Serbian fielded forces and military industries. Attacks on Serbian arms manufacturing capabilities will be closely co-ordinated with information operations to alienate loyalty, support and confidence among Milosevic's inner-circle of supporters.

At long last, SACEUR now accepted that some such reorientation of effort was necessary. During the following days, he discussed Short's proposals with Washington before presenting them to the QUINT chiefs of staff on the 25th. According to the record, SACEUR 'wished to attack targets that were part of Serbia's industrial base, those that were "leadership sustaining", the electrical power grid, lines of communication, leadership and media targets'. He then provided a long list of examples, all of which were potentially open to objection on political grounds or because they involved a high risk of collateral damage, and asked the assembled chiefs for their support in persuading the rest of NATO to accept his proposals. Finally, he delivered an uncompromising message from US Secretary of Defence Cohen:

The US wanted these targets bombed and needed support. NATO needed to announce that there was going to be greater collateral damage, but stress that this was in order to avoid a ground campaign.

Broadly, the American aim was to bring Allied Force to a successful conclusion more rapidly through the application of strategic air power. The intensified strategic campaign would also help to fend off British pressure to prepare for an opposed ground offensive. Collateral damage was an unfortunate but inevitable consequence, which would have to be accepted. France and Germany held similar views on the undesirability of a ground campaign, but they were averse to intensified strategic bombing at the same time, especially if more collateral damage was involved. Instead, they hoped that victory might be achieved by combining NATO's existing air strategy with diplomatic pressure. The British, by contrast, doubted that air power could exert enough leverage on the FRY and believed that a joint air and ground campaign would be necessary if NATO's objectives were to be achieved.

Hence, SACEUR found that neither Kelche nor General Von Kirchbach (Germany's Chief of Defence Staff) nor CDS were prepared to pledge immediate support for his proposals. General Clark reiterated his position on 28 May, this time with the backing of the CJCS, presenting the other chiefs with four categories of target based on various relationships between military importance and collateral damage risk; but Kelche and Von Kirchbach were again hesitant, and CDS said that the UK needed more time to clear targets with the Attorney General. It will never be known how – or even whether – this impasse would have been overcome because, on the very same day, Milosevic at last signified his willingness to accept the demands of the international community and withdraw his forces from Kosovo.

In this radically altered situation, the parameters of the debate inevitably shifted. No sooner were peace negotiations under way than some 16 out of 19 NATO members signified their desire to suspend the air campaign. However, outright suspension would have reduced pressure on the FRY to agree acceptable terms. As DSACEUR put it,

The problem lies, from a military point of view, in arriving at the delivery of the agreement while maintaining pressure. If we don't keep pressure on the Serbs, we fear that we may arrive at a position where we cannot deliver the agreement ... We need to maintain the pressure of bombing, within the current guidance ... until we have an agreement that can be delivered.

Yet the appearance of overt divisions within NATO would also have undermined the alliance's negotiating position. For the sake of alliance cohesion, a compromise was necessary. There was no bombing pause, but the tempo of the air campaign was reduced in deference to the sensitivities of the majority of NATO members; strategic attacks on Serbia virtually ceased, and the focus returned overwhelmingly to tactical targets in Kosovo. When, on 6 June, the Serbs assumed a more obstructive posture in the negotiations, Allied Force was intensified again until a satisfactory agreement was reached.

### **UK Air C2 Provisions**

As we have seen, significant changes in UK C2 provisions occurred between Granby and Allied Force. In 1996, PJHQ was established at Northwood under the Chief of Joint Operations (CJO), and the Defence Crisis Management Organisation formed within the MOD. During the same period, the RAF created a UK CAOC, and HQSTC also began investigating the scope for developing a deployable JFACHQ. Yet the JFACHQ concept was still very much in its infancy

when the Kosovo crisis erupted.<sup>63</sup> In 1999, CJO automatically became the Joint Commander for UK forces committed to the Kosovo conflict; his ACOS J3 was Air Commodore (later Air Chief Marshal Sir) Glenn Torpy. The command chain then led directly to the CBFI(A), which was raised to 1-Star level at the beginning of the operation; this post was assigned to Air Commodore Vaughan Morris, who also functioned as the UK NCC. Thus, compared with Operation Granby, the UK command chain was shorter and simpler: there was no joint headquarters in theatre.

As an NCC, Air Commodore Morris sat in an NCC cell outside the formal CAOC structure and functioned in a consultative capacity and as UK red card holder. By the beginning of May, his staff at Vicenza numbered some 31 personnel. The force under his command comprised, at peak, 48 fixed-wing aircraft including 35 fast jets – a Harrier detachment based at Gioia del Colle in Italy, a Tornado GR1 detachment based at RAF Bruggen in Germany and a Harrier FA2 element afloat on-board HMS *Invincible*. Other aircraft included Tristar and VC10 tankers, E-3Ds and a Nimrod R1.

The revised command arrangements were favourably assessed in the main after-action reports. The RAF's lessons study on Allied Force praised the 'uncomplicated' national C2 structure that extended from PJHQ to CBFI(A) to unit level, describing it as 'simple and effective'. A lack of interference from other headquarters was also noted. The report made two recommendations. First, on occasion, more direct links between the CBFI(A) and HQSTC might have been beneficial, especially where the delivery of air capability was concerned. It was suggested that PJHQ might 'consider how best to interface the NCC with the Supporting Command, without prejudice to the C2 chain'. Second, while the upward command channel from CBFI(A) to the ACOS J3 at PJHQ had worked extremely well, this was 'because ACOS J3 was an airman and understood the inherent [air] problems'. The same degree of understanding appeared unlikely if the post was occupied an Army or Royal Navy one-star. The lessons study suggested that ACAS liaise with the COS PJHQ to consider how best to create airman-to-airman links within the joint C2 chain when the ACOS J3 at PJHQ was not an airman.

While target selection in Allied Force was overwhelmingly the responsibility of the Americans, and proposed targets were subject to NATO endorsement, they also required the approval of the UK Attorney General. However, for the principal target sets, authority to approve attack sorties involving RAF aircraft was delegated via CJO to the CBFI(A) through a British TD, which was repeatedly updated as the operation progressed. The various constraints laid down in the TD were aligned with those specified by the ROE.

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63. Thompson, 'Post-Cold War Development of United Kingdom Joint Air Command and Control Capability', p. 78.

The TD described the aim of British military intervention as being to reduce the Serbs' capacity to repress the Kosovo Albanian population. Later directives elaborated on this basic goal, stating that it would 'be achieved by severing command and control links and lines of communication between Belgrade and Serb units in the field, degrading the operational capability of those deployed units, whilst simultaneously degrading the military infrastructure that supports Serb aggression'. Offensive operations were to be subject to the British government's declared objectives, to geographical areas defined in the appropriate ROE and to 'the need to avoid actions which would undermine domestic or international support for the use of armed force'.

Any risk to British forces was to be kept to 'a minimum commensurate with the military gain from the attack', and attacks were to be confined to targets in the FRY. All military action was to be consistent with international and British law and was to be limited to what was necessary and proportionate to the achievement of the declared military objective. Most of all, participating British forces were directed to minimise the risk of collateral damage. The TD stated explicitly that attacks were to be directed against military targets; neither civilians nor civilian infrastructure were to be targeted directly and every effort was to be made to minimise civilian casualties and damage to civilian property or to sites of religious and cultural significance (see Annex B).

At the beginning of the operation, the UK TD imposed constraints very similar to those contained in the Granby directive. However, there were no delegations at all. All targets assigned to UK assets had to be referred back to the responsible MOD authorities for evaluation. The total absence of delegations reflects the fact that NATO did not expect Allied Force to last for more than a few days.

Proper delegations were subsequently introduced and gradually extended as the campaign progressed. The main delegated military target categories were lines of communication, petrol, oil and lubricants, military and Ministry of Interior headquarters, barracks, military equipment and ammunition storage, airfield facilities, IADS and military vehicles, troop concentrations and staging areas. The key advance from Granby was the introduction of formal measurements for the two associated risks of civilian casualties and collateral damage. These were based on the number of civilian casualties expected and the distance of the target from civilian objects. Under both headings, the risks could be assessed as low, medium or high. The delegations to CBF(A) covered targets with a low civilian casualty risk and a low or medium collateral damage risk. However, any target assigned to RAF aircraft that carried a medium or high civilian casualty assessment or a high collateral damage assessment required clearance from the Attorney General, CDS (or DCDS(C)) and the Secretary of State. Additionally, targets in Belgrade, presidential residencies, industrial targets and state media targets required the Prime Minister's approval.

Throughout the Kosovo conflict, deployed RAF forces took the greatest care to fulfil the requirements of the TD. A few targeting proposals were rejected at the highest level: by 8 May, three targets allocated to the GR7s had been vetoed from London since the beginning of the operation. A television transmitter at Kapaonik was rejected because its use was considered to be entirely civilian, and an ammunition storage facility at Novi Pazar was refused because it was identified as a storage site for Bacteriological Warfare (BW) shells; the rejection of a petrol and oil storage area located on the outskirts of Bogatovac reflected concerns over collateral damage if unguided bombs were used, but the target was later cleared for attack with precision-guided weapons.

Attacks by US assets based in the UK were also subject to UK approval, and clearance for some 14 of the targets involved had been withheld by 8 May. Of these, eleven had no military connection, one was identified as a possible BW storage site, one was in Montenegro and one was inappropriate for the attacking aircraft's weapons system. In addition, clearance for an F15E attack – requested 20 minutes before take-off – came too late for the planned mission, which was then reassigned to assets based in theatre. Several of the rejected targets were also ruled out by the US authorities in Washington; others, originally rejected because they were non-military, were later attacked after military use was verified. However, certain US-UK differences on targeting proved beyond resolution. At the same time as rejecting the BW storage site attack by UK-based US aircraft carrying air-launched cruise missiles, the British authorities requested that the target should not be approved for a strike by any nation or system. It was hit by theatre-launched Tomahawk Land Attack Missiles (TLAM) less than twelve hours later. Fortunately, there was no resultant toxic cloud.

On a small number of occasions, the CBF(A) had reason to use his red card – his power to reject particular targets selected for the RAF by the CAOC. These tended to be secondary targets that had already been bombed. Such decisions were taken in consultation with his legal adviser, an officer of wing commander rank also located at Vicenza, who examined all targets assigned to the GR7s and GR1s. For example, on 17 April, the GR7s were allocated seven specific aiming points at the Urosevac army barracks as an alternative target in the KEZ; but when the most recent BDA imagery of the barracks was examined, it clearly showed that all had previously been hit and that the targeted facilities had been destroyed or severely damaged. The legal adviser therefore pointed out that that the proposed attack involved the inappropriate and disproportionate use of military force and could be judged unlawful on this basis. Moreover, it offered no definite military advantage. The CBF(A) then immediately informed the CFACC that he could not approve the target. Diplomatically, he did not question the legality of the task but emphasised instead his unwillingness to place the attacking aircraft at unnecessary risk for little or no military gain. Both Short and CINCSOUTH, Admiral Ellis, agreed with his judgement.

Updates to the UK TD reflected the inherent difficulties of the operation. At first, the TD stipulated that no weapons other than PGMs should be employed, but this restriction soon placed the GR7s at a considerable disadvantage. On a number of occasions during the first week of hostilities, they were unable to engage targets because their laser-guided Paveway II bombs could not be accurately aimed through cloud, and many other aircraft sent to the KEZ without specific tasking returned to base with their weapons. Although the theory was that Airborne Forward Air Controllers (AFACs) would direct them on to targets as they were identified by NATO Intelligence, Surveillance, and Reconnaissance (ISR) assets and other intelligence sources, VJ and MUP units often failed to materialise. To address the first of these problems, the GR7s were permitted to release unguided munitions, and this provision was then extended to allow free-fall 1,000lb and RBL755 cluster bombs to be dropped through cloud on to GPS co-ordinates. Initially, however, engagements of this type were made subject to the Secretary of State's approval. At the same time, so-called 'Kill-Box' targets were introduced. CDS's revised TD of 3 April 1999 stated:

Kill-Box Operations. You are authorised to delegate authority to CBF(A) to allow UK aircraft to attack targets which represent an immediate or emerging immediate threat to NATO Forces or Kosovar Albanians in designated areas (Kill-Boxes) when planned as part of a specific operation, keeping me [CDS] informed.

The term 'Kill-Box' had been employed in previous conflicts, such as the Gulf War, but apparently incurred official displeasure in the context of Allied Force and was soon replaced in CDS's TD by 'VJ/MUP engagement areas' and then by 'VJ/MUP operating, assembly and staging areas'. Finally, these categories of target were referred to simply as 'Assembly Areas'.

The language evolved, then, but the basic concept remained the same. The GR7s were effectively authorised to bomb pre-designated areas where intelligence suggested the presence of FRY troops, military vehicles or artillery. If primary targets could not be identified or failed to satisfy the ROE, and a target could be located in one of the designated areas, the GR7s were permitted to attack it. The attacking pilot was required to determine that the risk of civilian casualties was low, a stipulation that meant in practice that the target could not be located in a built-up area; and it was necessary for the AFAC to confirm that the target was military and to mark it, although unmarked targets could be attacked provided that they were identified as military by the GR7 pilot. A substantial number of attacks took place in accordance with this new procedure in the first half of April. For example, on the 12th and 13th, ten GR7s dropped 1,000lb bombs through cloud on to GPS coordinates within designated areas after overcast conditions prevented them from locating their primary or alternate targets.

Area attacks then came to an almost complete halt: only two GR7s bombed area targets between 16 and 30 April. Cloud cover was cited as the reason for aborting an area strike on the 19th, and the precautions governing these attacks would certainly have been difficult to satisfy in the generally overcast conditions that prevailed in the second half of the month, but there was an additional problem. The detachment's primary targets in this period were invariably fielded forces in Kosovo; hence, the GR7s normally carried RBL755 cluster bombs. Yet RBL755 was often unsuitable for bombing fixed facilities, which were the only targets aircraft could realistically hope to engage if cloudy conditions prevented them from striking their primary targets, due to the time involved in obtaining clearance from the Secretary of State. At this stage, the GR7s were not authorised to fly with mixed weapon loads, but simultaneous carriage of RBL755 and 1,000lb free-fall bombs was proposed as early as 12 April.

The issue was still under consideration when, on the 26th, the GR7 detachment requested clearance at short notice to drop unguided 1,000lb bombs through cloud on to a SAM site. Unfortunately, it proved impossible to obtain the Secretary of State's approval in the time available (54 minutes). As a result, the GR7s were restricted to the use of Paveway II. The aircraft involved flew all the way to their target area, but poor weather prevented the release of any weapons, and they returned to base. The post-mission report recommended that the Secretary of State delegate responsibility for approving attacks through cloud with unguided weapons to the CBFI(A). The impact was decisive. On 5 May, the delegation was approved for targets with a collateral damage risk no higher than medium<sup>64</sup> and a civilian casualty risk of low.<sup>65</sup> At about the same time, the GR7s were at last authorised to fly with a combined weapons load of RBL755 and 1,000lb bombs, and they regularly carried both weapons for the remainder of Allied Force.

Assembly Area attacks resumed, but whereas, during April, the GR7s only mounted area strikes when they were unable to bomb primary or alternate targets, they were specifically tasked against a number of Assembly Areas in the first half of May. The TD was amended once again to incorporate SACEUR's explicit insistence on confirmation from two independent sources that the target area had been cleared of its former residents and had not been re-occupied by refugees, and on a civilian casualty risk assessment of 'low'. An exhaustive clearance procedure evolved to meet such demands:

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64. Medium Collateral Damage Risk was defined as follows: 'Civilian objects within a radius 250-500m of the target, but no civilian objects inside 250m'.

65. Low Civilian Casualty Risk was defined as 'Zero to 30 casualties'.

- a) Task Force Hawk (TFH)<sup>66</sup> get a tip from the UCK<sup>67</sup> and back it up with their own visual recce (from helicopters flying near the border), ELINT using ground-based and airborne platforms and other US-only intelligence information available to them. This is a multi-source assessment.
- b) TFH conduct an IDP<sup>68</sup>/Friendlies assessment, collateral assessment and military utility assessment before passing the detailed information to JAC Molesworth.<sup>69</sup>
- c) JAC Molesworth run a check on the TFH assessment and fuse it with their own intelligence from a variety of sources. This will include imagery from various platforms and SIGINT. This is a second multi-source assessment and while verifying the TFH analysis also looks at collateral damage considerations.
- d) JAC Molesworth pass the target information down to CAOC who run a final quality control check using SIGINT, U2 radar image and near real-time UAV<sup>70</sup> coverage. This is a third multi-source assessment which also looks at IDP and collateral damage considerations.
- e) Once all of the above hoops have been jumped through the CFACC clears the target for non-precision attack, even through cloud.

Nevertheless, at least two Assembly Area attacks on ‘cleansed’ Kosovo Albanian villages assigned to the GR7s were blocked at CBF(A) level because only one intelligence source could confirm that there were no longer any refugees at the target locations.

RAF aircrew also remained bound by the UK TD stipulation approving Assembly Area bombing only if a specific target could be identified and marked within it by the attacking aircraft or the AFAC. This task was difficult to achieve

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66. Task Force Hawk was the US Apache helicopter detachment that deployed to Macedonia in April 1999.

67. UCK – Ushtria Çlirimtare e Kosovës – was the Kosovo Albanian name for the Kosovo Albanian insurgent force more commonly referred to as the Kosovo Liberation Army.

68. IDP – Internally Displaced Persons.

69. The US European Command’s Joint Analysis Centre (JAC) at RAF Molesworth processed, analysed and consolidated data to produce fused intelligence information focusing on an area of responsibility consisting of more than 77 countries across Europe, Africa and the Middle East. They supported mission planning and operations by US, Allied and NATO commanders during peace, crisis and war.

70. UAV – Unmanned Air Vehicle.

under any circumstances from altitudes of 15,000-20,000ft, especially when potential targets were camouflaged or located in dense woodland. It was virtually impossible in overcast weather conditions, and such conditions prevailed throughout the second fortnight in May. Many missions were simply cancelled before take-off when it became obvious that the necessary criteria for attack would not be satisfied. On 7 May, the 5 ATAF C3 Current Operations Chief at the CAOC acknowledged that a variety of national restrictions prevented particular NATO members from executing 'drops through the weather' on to Assembly Areas and confirmed that the CAOC would cancel missions that could not drop through cloud when that was known to be the only option for the day.

Although application of the TD was primarily the responsibility of the CBF1(A), its requirements had to be observed at the very lowest tactical levels. Even if a target had been cleared for engagement by higher authorities, such as the CAOC, the final decision to engage still rested with the crew of the attacking aircraft. While they were meticulously careful to avoid inflicting civilian or friendly casualties or collateral damage, the large-scale flight of Kosovo Albanians to neighbouring countries increased the difficulty of distinguishing between military convoys, which were valid targets, and those containing civilian vehicles, which were not. On 14 April, an airborne command and control aircraft (call sign Moonbeam) informed two GR7s of a large convoy of around 100 vehicles east of Djakovica; Moonbeam had sought approval from the CAOC to task combat aircraft against it. Having identified the convoy, the GR7 crews observed it through their gyro-stabilised binoculars. One of the pilots, an American exchange officer, subsequently recorded:

It was about 1.5 nm long and tightly packed. I flew directly over it and noticed colours, reds and yellows, in the column of vehicles. I immediately thought that these were not military vehicles, or that it was a set-up by the Serbs.

A second overflight confirmed his impression that the convoy comprised both military and civilian vehicles, and he therefore warned other NATO aircraft in the area not to attack it. His action prevented two F-16s from targeting the convoy and may have saved hundreds of Kosovo Albanian lives. On the same day, NATO aircraft struck two other convoys containing civilian vehicles in the Djakovica area, killing 73 refugees. A very similar incident occurred on 21 May, when another GR7 pilot decided that a convoy approved by the CAOC for attack required further investigation. Again, he identified civilian vehicles in the column and warned off the rest of his formation. 'Shortly afterwards, the target clearance from the CAOC was withdrawn.'

As the Bruggen-based Tornado GR1 detachment was restricted to the use of LGBs against pre-planned fixed targets in Serbia, their missions did not raise the many complex problems that confronted the GR7 pilots flying against tactical

targets in the KEZ. Targets were always cleared before the GR1s took to the air. Instead, the difficulties that confronted the detachment were of a more practical nature and stemmed from Bruggen's distance from the FRY and the persistently poor weather experienced during Allied Force, which often became an insuperable obstacle during the transit to Kosovo or over the target area. Combined, these two factors resulted in the cancellation of more than half the planned GR1 missions.

Superficially, it appeared that the command decision to operate from Bruggen was mistaken and that the GR1 detachment could and should have been deployed forward at the earliest opportunity. This basic error was then apparently magnified by their belated move to Solenzara, Corsica. Although the deployment involved a significant commitment in terms of effort, resources and expenditure, peace negotiations had been initiated by the time it was complete. Thereafter, operations over Serbia were severely constrained on political grounds, and the GR1s consequently flew very few sorties from Solenzara before Allied Force ended.

Publicly, the RAF defended the decision to operate from Bruggen with the argument that the limited GR1 flying rate originally envisaged appeared achievable from the base. The reality was that forward basing would have been extremely difficult in March or April 1999. This was partly because of other operational pressures on the RAF's fast jet fleets and partly because of the on-going GR1 to GR4 upgrade programme. The Thermal Imaging Airborne Laser Designation (TIALD) pods essential for LGB missions were in desperately short supply, and relatively few GR1 crews had much experience with the system or had benefited from recent TIALD training. By operating from Bruggen, it was possible for the RAF to pool the TIALD expertise of the three resident GR1 squadrons into a single composite unit. Moreover, the few available pods could be used for training when they were not committed to operations, gradually increasing the number of TIALD-qualified crews. This, in turn, allowed the RAF to consider forward basing in May.

The distance between RAF Bruggen and the operational theatre had further repercussions where the day-to-day exercise of air C2 was concerned. Arguably, there was inadequate 'forward' GR1 expertise within the Allied Force targeting machinery so that, under American direction, the Bruggen detachment was sometimes allocated targets inappropriate to the TIALD-Paveway combination. Other weapon-to-target matching errors included tasking to strike with Paveway II a large concrete airfield apron located near to other targets better suited to the weaponry available and particularly vulnerable to attack with Paveway III. The CBF(A) subsequently intervened to establish better liaison arrangements with the CAOC, and weapon selection was delegated to 14 Squadron's experts at Bruggen. He is said to have been 'successful in effecting a move to more coherent and appropriate tasking for the GR1s.'

The GR1 crews had been briefed to expect determined opposition from the FRY IADS and approached their target areas with a reasonable understanding of the weapons ranged against them. Mission planning always drew on the latest intelligence on SAM locations, and maps were produced showing so-called 'threat rings' around the various SAM systems; mission routes were designed to minimise flying time within each threat ring and, if possible, avoid them altogether. Nevertheless, post-war analysis demonstrated that GR1 aircrew were 19 times more likely to observe SAM launches or Anti-Aircraft Artillery (AAA) fire during an aircraft sortie than GR7 pilots and were also far more likely to feel sufficiently threatened to take evasive action. This was because they spent more time operating over the Serb heartland, whereas the GR7s were mainly tasked over Kosovo.

The extensive NATO commitment to SEAD during Allied Force has already been described, but RAF GR1s equipped with ALARM missiles might also have contributed to the SEAD task. Unfortunately, early in the operation, the CBF(A) prohibited the use of ALARM, emphasising the limitations of the system, particularly against intermittent or fleeting targets. The primary SAM threats were observed to have low radar emission rates and short transmission periods, and SAM systems were frequently moved and were considered difficult to locate. Pre-flight positional information on potential targets could be five hours out of date by the time that Bruggen-based GR1s arrived over the target, preventing the use of ALARM's pre-planned Target-of-Known-Location mode. Use of the weapon was also considered to entail an excessive risk of collateral damage.

Although these arguments were very carefully considered and were fully supported by the AWC, they caused considerable frustration among the ALARM specialists at Bruggen – 31 Squadron – who felt that the command chain was failing to grasp the potential for employing the missile in the Yugoslav theatre. At this time, they were witnessing significant SAM and AAA activity and frequent use of the American HARM missile in a manner that seemed no less likely to cause collateral damage.

Pressure from RAF Bruggen and an increased threat from FRY SAM systems during May eventually led to the removal of some restrictions on the employment of ALARM. Nevertheless, its use was heavily caveated. ALARM could only be launched when crews possessed real-time intelligence on the location of SAM sites and when there was minimal risk of collateral damage. In practice, these requirements proved extremely difficult to satisfy because of a combination of effective anti-ARM tactics by the FRY SAM operators and a lack of sufficiently recent and accurate data on SAM locations. Two ALARMS were released on 21 May, one exploding near an active SA-3 site. However, a GR1 formation targeted by a sustained SAM attack on 26 May was not equipped with ALARM because there was no prior knowledge of the location of the SA-3 and (mobile) SA-6 sites involved.

Understandably, from the aircrews' perspective, it seemed that lives were being placed at unnecessary risk by restrictive ROE designed largely to satisfy political concerns over the avoidance of collateral damage. Shortly afterwards, on the recommendation of the CBF(A), the restrictions were further relaxed: crews were authorised to use ALARM in all five of its operating modes, including the Loiter and Area Suppression modes, to allow so-called Corridor Suppression.<sup>71</sup> But these new provisions came too late to make much difference. ALARM was only employed on one further occasion, when four missiles were released during the final GR1 mission of Operation Allied Force on 7 June.

## **Tactical Air C2**

Tactical command and control for Operation Allied Force was assigned to the NATO EW force drawn partly from the RAF's E-3D squadrons – 8 Squadron and 23 Squadron – based at Waddington. They could at first provide seven crews, all of which were 'constituted' – in other words, the same crew members always flew together. Operational effectiveness unquestionably benefited from the understanding and familiarity that this arrangement engendered. At first, three crews deployed to Aviano air base in Italy together with three aircraft, but they were joined by a fourth crew after hostilities began. Aircrew were subsequently rotated between Aviano and Waddington. E-3D crews consisted of three elements – the flight-deck, the mission crew and the communications operator and airborne technicians. The Tactical Director headed the mission crew, which consisted of surveillance and weapons teams.

Primarily equipped for the Cold War airborne warning task, the E-3D was not a fully-fledged command and control asset; it was fitted with only nine consoles, whereas the USAF's E-3Cs possessed 14. The crews deployed to Aviano each included an additional weapons controller (three as opposed to the usual two) – a provision that reflected the expectation of high tasking levels and one that had already proved essential during Operation Deliberate Force in 1995. However, to accommodate the extra console, it was necessary to dispense with the Electronic Surveillance Measures console or a surveillance operator. The displacement of either crew member inevitably had a direct impact on the quality of the Surface and Recognised Air Picture and could affect the timeliness of threat warnings. Ultimately, the on-board Tactical Director, who headed the mission crew, had to allocate the limited number of remaining consoles on a priority basis

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71. In Corridor Suppression, ALARMS were launched along the projected aircraft track; they then climbed to high altitude and glided along the track for a distance of about 25-30 miles with the missile seeker listening for SAM radars. If emissions were detected, the missiles attacked the radar. If no emissions were detected, the missiles glided to an imaginary target option ahead of the aircraft. Crews could ensure that this position satisfied collateral damage criteria.

that took account of the intelligence situation, the size of the ATO and the position of the E-3D's orbit.

The totality of NATO airborne C2 coverage consisted of three orbits in the Balkan region – Bikini in the north, Bunny in the centre and Pluto in the south – which were maintained by the E-3Ds and the multi-national NATO E-3A force. Pluto would quickly prove the most challenging due to the volume of control tasks; many of the AAR tracks were located in the southern orbit. Coverage had to be maintained for 24 hours per day, the RAF being responsible for 25 per cent of the task. They typically flew two daily missions, chiefly in the Bikini orbit, with on-station periods from 0600-1200 and 1800-2400. Their first mission was flown on the evening of 24 March, when multiple NATO strike packages attacked Serbia. One of these, consisting of USAF F-15s, F-16s, F-117s, tankers and a number of other aircraft, had just reached Serb airspace from the north, when the on-task 8 Squadron E-3D detected radar contacts in the area of Batajnica airbase. Correlated electronic surveillance information then confirmed that two MiG 29s had been launched, the F-15s were duly warned, and both Serb fighters were shot down.

On 27 March, another 8 Squadron crew were on station in the Bikini orbit when they heard a Mayday call from an American pilot on the 'Guard' or Military Air Distress frequency (243 MHz), stating that his aircraft had been hit. In a second call about a minute later, the pilot (callsign Vega 31) confirmed that he was ejecting. As his aircraft was an F-117 and a US 'national' asset, the E-3D crew had very little information about his mission but nevertheless remained on station, extending their time on duty to control and co-ordinate his rescue.

After alerting the CAOC, the E-3D broke orbit and moved east to achieve better communications and radar coverage of the Belgrade area, accepting the greater risks involved. While it never subsequently came within communications range of the pilot, his fighter escorts established contact with him, and other combat aircraft – ground-attack and SEAD assets – were quickly diverted to support a Combat Search and Rescue (CSAR) mission. The change of tasking caused their fuel requirements to rise substantially, requiring the E-3D to overhaul AAR plans and request more tankers, which soon arrived. About one hour after the first Mayday call, the E-3D crew were advised of the pilot's location, which was quite close to the Serb border.

As the CSAR force assembled, the E-3D coordinated the supporting aircraft to ensure that all, suitably refuelled, were ready to enter Serbian airspace at the same time – during the ingress of the rescue helicopter and an accompanying A-10, which functioned as local tactical commander for the entire CSAR package. At this critical stage, the E-3D detected a helicopter flying from Belgrade towards the crash site. The Serbs were attempting to get there first, having established Vega 31's position via SIGINT or triangulation. The crew sought and received permission to engage the helicopter, which was relayed to the on-station F-15s. They duly changed course to intercept, but their prospective

target then conducted an immediate 180-degree about turn. No other Serbian aircraft were launched, although their GBAD systems were very active and made extensive demands on the American SEAD. Ultimately, the rescue helicopter successfully reached the crash site, collected the F-117 pilot and recovered to friendly territory. Among the congratulatory messages that reached the E-3D crew after their return to Aviano was one from the President of the United States.

The growing scale and complexity of Allied Force presented the RAF E-3D detachment at Aviano with a gruelling task throughout much of April. To an extent, they found themselves the victims of their own success. Increasingly, they were assigned to the busier southern orbit, while NATO E-3As – effectively tied to NATO bases in Southern Italy and Greece – were sent to the Bikini orbit in the north; their only northerly basing option was in Germany. The length of the transit and the E-3A's lower endurance (compared with the E-3D) often left them struggling to achieve the planned six hours on station, and the E-3Ds were regularly called on to make good the deficit by extending their time on task up to seven hours. It is thus not surprising to discover that their in-theatre flying was at a rate equivalent to 130 to 140 per cent of the factored E-3D rate. The workload born by the weapons controllers was said to have 'reached and sometimes exceeded saturation levels'; for the majority, uninterrupted periods of over six hours on console were the norm. On one night sortie, a single weapons controller controlled ten tankers and their refuelling 'trade' of approximately 90 fighters simultaneously on two separate frequencies. Without his efforts, a significant proportion of the planned offensive air tasking would not have been fulfilled. Although this was an extreme example, weapons controllers were regularly expected to direct between thirty and forty aircraft into battle and control their return from hostile territory. The burden imposed by the AAR control task is illustrated by the fact that, at the height of the campaign, 156 tanker sorties appeared on the ATO.

The E-3D detachment confronted a number of operational challenges during April, and solutions were not always readily forthcoming. The poor weather that affected Allied Force as a whole brought periodic rain to Aviano, where the wet runway forced the E-3Ds to take off with less than their maximum fuel load. This inevitably reduced their endurance without AAR, which was in high demand. There were also further difficulties with US-only packages, which were partially but not entirely addressed through liaison with the Americans on the ground and by flying with US personnel on board the aircraft. Beyond this, as the E-3D was procured primarily for warning and surveillance, it did not have enough radios to meet the demands of airborne C2 in large-scale high-intensity operations – a fact already well established before March 1999. The RAF therefore initiated action under UOR procedures to install three more radios into each aircraft, but there was not enough time to modify them before the ceasefire in June.



An RAF E-3D at Aviano during Operation Allied Force.



Harrier GR7s at Gioia del Colle.

More broadly, it became clear as the month progressed that the sheer volume of tracking, reporting and controlling could not be sustained by the participating RAF and NATO E-3s. Fortunately, their numbers were in due course augmented by USAF E-3Bs and E-3Cs based at Geilenkirchen, which could also assist by operating in the northern orbit and controlling the US national packages that transited into Serbia from that direction. Additionally, measures were initiated to move the control of AAR and airlift traffic to ground agencies, and the US aircraft carrier *Theodore Roosevelt* brought further air command and control capability into theatre in the form of E-2Cs. Nevertheless, the scale of the task continued to increase as NATO's order of battle expanded inexorably. As the CBF(A) put it, 'The airspace remains very congested with worse to come as additional assets arrive in theatre.'

During the first week of May, the revision of airspace management procedures eased the burden on the E-3D detachment to a limited extent. On the 4th, a 23 Squadron crew was operating in the southern orbit. Their aircraft had been positioned at its combat ceiling – an altitude beyond the reach of most of the other E-3s – to maximise radar coverage, and it was this factor that allowed them to detect the take-off of another MiG 29 from Batajnica, deep in Serbia. The aircraft was at first invisible to the E-3s in the central and northern orbits. After clearing all friendly aircraft from the area, the E-3D crew vectored a formation of F-16CJs on to an intercept course, and they quickly gained radar contact with the MiG. Nevertheless, the beyond-visual-range ROE criteria were not fully satisfied, and it was therefore necessary to obtain engagement authority from the CAOC, which was supplied with less than ten seconds remaining before the F-16s' fuel state compelled them to withdraw. They subsequently employed two AIM-120 AMRAAMs to destroy a Serb fighter that had launched to attempt an intercept of its own.

The assumption of AAR and air transport control responsibilities by ground-based agencies was followed on 7 May by a revised tasking directive that assigned USAF E-3Bs to the southern orbit and reduced E-3D flying in the south to one sortie per day, the other being flown in the central orbit. A third crew maintained ground alert each morning. On the 20th, an eighth E-3D crew became available. Yet the Aviano detachment had still to contend with an exceptionally heavy operational workload, and the basic air C2 task was complicated by frequent weather-related changes to the flying programme. Moreover, the alert aircraft was scrambled on 12, 17, 18, 21 and 23 May. It is worth considering that the detachment flew three very demanding sorties on each of these days with just three aircraft and four crews at Aviano and with only seven or eight crews in the total.

After two air-miss incidents provided further evidence of the risks inherent in flying very large numbers of aircraft into a limited geographical area, a conference at Aviano brought together representatives from several fast jet and E-3 detachments and the CAOC; the fast jet community emerged with a far better

understanding of the challenges confronting the E-3 crews. Nevertheless, common sense did not always prevail. The 21 May scramble was necessitated by an aborted US E-3 sortie in the Bikini orbit. Once again, flight safety was compromised because the RAF E-3D crew dispatched to Bikini did not have access to the full US-only ATO, and they were even told not to track US assets in Serbian airspace. Although completely at odds with all accepted procedure and the extant Special Instructions (SPINS),<sup>72</sup> this bizarre stipulation is said to have been approved by the CAOC.

While the two fast jet squadrons were withdrawn from operations over the former Yugoslavia in June, the RAF's two E-3D squadrons continued to fly in support of NATO's Kosovo peace implementation mission, Operation Joint Guardian. Although there was a marked reduction in the tempo of airborne command and control flying, regular deployments to Aviano continued, and the E-3Ds had also to maintain a standby commitment from RAF Waddington. Thus, while they flew a total of 184 sorties during Allied Force, their ultimate flying effort over Kosovo was considerably greater. The Joint Guardian task was only completed at the end of 2001, by which time elements of the E-3D force had been committed to Operation Veritas in Afghanistan.

## **Aftermath**

The contrast between Operation Allied Force and Operation Granby could hardly be more pronounced where air C2 is concerned. In Granby, C2 was substantially delegated to the appointed coalition force commanders; there was inevitably some interference from the higher command and political levels, but it was not a significant feature of the Gulf campaign. In Allied Force, on the other hand, campaign planning and execution, the selection of target categories and even, in some instances, attacks on individual targets – including tactical targets – was subject to a degree of micromanagement rarely paralleled in recent military history. Above SACEUR, senior statesmen, higher NATO and national military staffs all became involved. The level of supervision and intervention was such that the scope for devising and executing an effective air campaign was severely prejudiced.

Further complications resulted from the absence of essential air planning machinery for more than one month after the outbreak of hostilities. Execution raised innumerable problems when short-notice and dynamic targets were involved, and post-mission assessment also left much to be desired. Moreover, the scale of NATO air activity and its compression into a relatively small

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72. Special Instructions or SPINS are issued alongside the ATO and provide theatre or sometimes mission-specific information to aircraft tasked by the ATO. They may supply elaborating information or lay down particular procedures and constraints within which the mission must be executed.

geographical area generated exceptional challenges in the sphere of tactical air C2. If Granby had lent support to the concept of centralised command and control and decentralised execution, Allied Force provided a salutary reminder of how difficult it can be to achieve.

By demonstrating the limitations of the basic CAOC structure, Allied Force suggested that UK plans to establish a deployable CAOC did not go far enough. It also drew attention (just as Granby had drawn attention) to the RAF's lack of deployable communications and CIS. The experience implied:

The SDR remit would only be met with the provision of a core JFACQ and not just a core AOC. The need for the 'Command' element of C2 of any JRRF air element was highlighted, along with the likely need, given the understandable political realities of delaying decisions to commit forces, of air C2 elements being able to 'hit the ground running'. It was also identified that C2 augmentees require both a core cadre framework of personnel around which to form and established SOPs to reference. As well as identifying deficiencies, a positive highlight was identified as being that the RAF's ability to provide even a limited number of experienced and trained personnel to the coalition AOC (from Air Warfare Centre, UKCAOC and other RAF elements) had enabled a significant degree of influence to be exercised within the ALLIED FORCE air C2 processes.<sup>73</sup>

Such arguments lay directly behind the decision to replace the UK CAOC with the JFACHQ in March 2000, but the new HQ had barely come into existence when, in May, it was called on to support Operation Palliser in Sierra Leone. This operation was initially a Non-combatant Evacuation Operation (NEO), but it soon developed into an intervention/peace-support operation. Initially, the JFACHQ's Plans (or A5) and Intelligence (A2) staff contributed to the Strategic Estimate and Air Estimate generated by PJHQ. The Air Estimate ultimately provided for the deployment of the carrier, HMS *Illustrious*, together with seven RAF Harrier GR7s and six Royal Navy Harrier FA2s, as well as eight C-130s and a mixed helicopter force.

On 11 May, *Illustrious* entered the operating area and the JFACHQ's peacetime director was nominated as JFACC for Palliser. He subsequently deployed with eight cadre JFACHQ personnel and visited the JTFC at his headquarters in Freetown before establishing his own HQ on board *Illustrious*. By 12 May, the NEO had largely been completed, but the nature and scale of the operation was changing to meet a growing threat from rebel forces known as the

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73. Thompson, 'Post-Cold War Development of UK Joint Air Command and Control Capability', p. 76.

Revolutionary United Front. On the 17th, the Harriers began flying air presence missions supporting the JTFC's information operations, tactical air reconnaissance and training sorties to establish local operating procedures for CAS. By 7 June, stability had been restored allowing *Illustrious* to withdraw and the JFACHQ to return to the UK.

Operation Palliser proved to be an extremely valuable 'proof of concept' for the JFACHQ, albeit in a small-scale and national context. The key lesson was that the JFACHQ – or at least the JFACC and his A5 staff – would have been better positioned at the JTFHQ. Operating afloat, their presence was easily forgotten by the JTFC, and they lacked a full understanding of his intent and CONOPS. This disadvantage was compounded by weak operational-level communications, secure communications between *Illustrious* and the JTFHQ being a particular limitation. The experience gained during Palliser helped shape the JFACHQ's development thereafter. An initial operating capability was declared in October 2000, while full operational capability followed a year later.<sup>74</sup>

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74. Thompson, 'Post-Cold War Development of UK Joint Air Command and Control Capability', pp. 84-85.

## **OPERATION TELIC: THE SECOND GULF WAR, 2003<sup>75</sup>**

Operation Telic was the UK name for the US-led coalition operation entitled Iraqi Freedom, also commonly referred to as the Second Gulf War. Telic was launched in March 2003; three weeks later, its primary aim was achieved when coalition troops entered Baghdad and precipitated the downfall of Saddam Hussein's regime. Operation Telic was the RAF's largest single undertaking since Operation Granby by a substantial margin. At peak, some 8,000 personnel were deployed in theatre along with 126 aircraft, a force consisting of 67 fast jets and 59 other fixed-wing and rotary-wing assets. During the course of the operation, the fixed-wing aircraft flew more than 2,500 sorties, and RAF combat aircraft released 919 munitions.

Yet if Telic was comparable to Granby in terms of forces committed, tempo sustained, and effort expended, the two operations were very different in several important respects. Telic did not involve a drawn-out and pre-planned air offensive like the coalition campaign mounted in 1991. Instead, air power was predominantly used in support of the Land Component during its rapid advance from Kuwait to Baghdad and in Counter-Theatre Ballistic Missile (Counter-TBM) operations over western Iraq in conjunction with coalition SF. Consequently, while air C2 in Operation Telic involved at least some obvious continuities, new challenges had also to be confronted.

### **Background, Planning and Command Arrangements**

The RAF's involvement in Operation Telic followed on from some thirteen years of almost continuous UK air operations in the Persian Gulf. After Granby, the RAF was committed to the protracted task of patrolling the Southern and Northern Iraqi No-Fly Zones (NFZs) as part of another US-led coalition. By 2002, the UK contribution to NFZ policing was covered by the operation names Resinate (South) and Resinate (North). Eight Tornado GR4s and six Tornado F3s were maintained in the south with AAR support, while the northern commitment was assigned to four Jaguars. The coalition and UK Air Headquarters and the CAOC were located at Prince Sultan Air Base, Al Kharj, Saudi Arabia.

In March 2002, HQSTC received the first indirect intimations that the United States was preparing contingency plans for a major operation against Iraq. By May, contingency planning was also being conducted in the MOD. ACAS reported to CDS on the 22nd that the UK could deploy some 88 fast jets and 38 supporting aircraft within a period of between three and four months for an operation of the scale of Granby.

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75. Unless otherwise stated, this chapter is based on the unpublished AHB narrative *The Royal Air Force in Operation Telic*.

At the beginning of July, the MOD confirmed to the Prime Minister that US military thinking on Iraq was 'quite well advanced' but that no political decision had been taken. US planning assumed that the objective of any prospective operation would be to overthrow Saddam Hussein's regime, destroy his Weapons of Mass Destruction (WMD) capability and reduce the perceived threat that Iraq posed to surrounding countries and the US itself. Although US CENTCOM at first envisaged that only American forces would be involved, by July there was a *de facto* invitation to the UK and Australia to participate.

As a first step, the US invited a small number of British military personnel to join their planners at various levels of command. Consequently, the Secretary of State sanctioned the early dispatch of a six-man team to Tampa on the strict understanding that no political decision had been taken on UK participation in an operation. The UK was officially informed and indoctrinated into US planning on 16 July, and PJHQ was then tasked to make an assessment of the plan to inform ministers on the 23rd and examine UK contingency options in a US-led operation against Iraq. The Contingency Planning staff at HQSTC also initiated work on the potential UK air contribution at this time.

A more detailed picture of American planning soon emerged. The intention was to launch coalition forces into Iraq across both her southern frontier with Kuwait and her northern frontier with Turkey, and CENTCOM's basic Operation Plan (OPLAN), numbered 1003V, was designed to overwhelm the Iraqi regime through a co-ordinated multiplicity of threats applied across seven lines of operation. These were:

1. Operational fires
2. Operational manoeuvre
3. SF operations
4. Unconventional warfare/support to other governments
5. Influence operations
6. Humanitarian assistance
7. Political-military engagement

Within this very broad concept, the CFACC, Commander CENTAF, Lieutenant General TM 'Buzz' Moseley, was assigned five key offensive tasks:

1. Counter-Air (airfields and IADS)
2. Counter-TBM in western Iraq
3. Counter-Land
4. Strategic attack against regime targets (seen as vital to early regime collapse)
5. Support to SF

Initially, however, air power would be employed primarily for effect with the aim of achieving what was famously termed ‘shock and awe’. Hostilities would begin with a massive bombing effort covering a wide range of targets. The US believed that ‘the initial “shock and awe” created by the synchronised opening of both air and ground operations’ would ‘lead to the rapid collapse of much of the potential opposition, enabling the coalition to seize control of up to two thirds of the country within days’.

Kuwait, although small and potentially vulnerable, could always be counted on for support and was to be the launching platform for the southern offensive; but the northern axis was dependent on Turkey’s willingness to permit large numbers of coalition troops and aircraft to be based on her soil, and her government proved unwilling to enter into any such commitment. Nevertheless, in Washington, there was every confidence that the Turks would co-operate, and planning proceeded on this basis. This would have profound implications for the UK because CENTCOM quickly assigned a key role to British ground and air forces on the northern front.

HQSTC’s first outline plan for RAF participation appeared at the end of July and reflected the increased exchange of information between the UK and the US, as well as CENTCOM’s enthusiasm for UK involvement in northern Iraq. The plan envisaged offensive air operations by Tornado GR4s from their existing base in Kuwait, Ali Al Salem, and from Akrotiri or southeast Turkey, and air support to UK ground forces by Harrier GR7s from southeast Turkey. The F3s already located in Saudi Arabia would operate in the air defence role, while GR4s and Jaguars flew tactical reconnaissance missions from both the south and north. E-3Ds, Canberra PR9s and Nimrod R1s and MR2s were to operate from Cyprus or Oman. Eight tankers would be deployed, along with fixed-wing and rotary-wing air transport and air support for SF. The RAF’s tasking, as then understood, was as follows:

- a. Contribute offensive air assets to the US campaign against Iraq.
- b. Contribute additional ‘niche’ air capabilities that can add value to the US campaign against Iraq.
- c. Support a UK ground campaign inserting from southern Turkey into Northern Iraq.
- d. Enable an Air Point of Departure (APOD) in Turkey for the deployment of UK ground forces.

STC’s plan emphasised the RAF’s pronounced dependence on Turkish basing and overflight.

By the beginning of August, knowledge of OPLAN 1003V was being extended across key areas of the UK defence community, including the FLCs. On the 5th, a Crisis Planning Team formed in PJHQ, and DCDS(C) issued PJHQ with formal planning guidance four days later. PJHQ in turn presented a submission to DCDS(C) on UK contributions to the prospective operation on 13 September. During this period, the RAF was assigned the additional task of supporting Counter-TBM operations in western Iraq primarily through the deployment of a detachment of GR7s to Azraq in Jordan to collaborate with similarly committed USAF elements and coalition SF.

Between 19 and 22 August, the Chief of Staff, JFHQ, visited CENTCOM to discuss command and control and how the UK component could be integrated into a deployed CENTCOM forward headquarters. Although the nomenclature changed somewhat, the system that emerged differed little from that employed during Operation Granby. CJO was to become Joint Commander for the operation, exercising his responsibilities through PJHQ to the NCC at his deployed headquarters in the Gulf. As Joint Commander, he would exercise operational command over all UK forces assigned to the operation, while the NCC exercised OPCON of the three UK contingents – Air, Land and Maritime. In turn, the NCC delegated tactical command to the three Contingent Commanders. Where the Air Contingent was concerned, Tactical Control was to pass to the coalition Air Commander (the CFACC) during the execution of agreed tasks on the ATO.

The command structure was trialled in a five-phase exercise entitled ‘Internal Look’ during November and December and, as the NCC for an operation against Iraq had obviously to be involved in the exercise, it became necessary to settle his appointment before it began. Air Marshal Brian Burridge, the Deputy C-in-C at HQSTC, duly became NCC Designate at the beginning of October. During the exercise, Air Marshal Burridge, the staff of the JFHQ and augmentees from the three FLCs manned the National Contingent Headquarters (NCHQ).

Phases 4 and 5 of Internal Look took place at CENTCOM's prospective forward headquarters in Qatar.

Exercise Internal Look ended on 15 December 2002. It provided a clearer picture of the targeting delegations needed by the NCC and highlighted a number of potential areas of concern, such as the adequacy or otherwise of AAR provisions. Yet while many important lessons were apparently identified, the exercise seems only to have been a partial success where the Air Contingent was concerned. According to the official air lessons report:

The 3 vignettes played out were insufficiently long to draw significant conclusions. The crucial first few days of the campaign were not covered which failed to expose fully the problems of synchronisation between A and G days,<sup>76</sup> and the full air operations cycle was never achieved. In addition, many of the processes (ISR, BDA and the capacity of the ASOCs to manage the planned levels of KI/CAS<sup>77</sup>) that eventually proved key weaknesses were not highlighted.

As for the overall command and control structure, it probably represented the only logical framework for the UK to employ given the established functions of the MOD, PJHQ and the FLCs. The advantage of the system was that it provided a single operational commander in theatre acting on behalf of all deployed UK forces for Commander CENTCOM to deal with, while effectively integrating the three UK contingents into the relevant coalition components at the same time. The one possible disadvantage had previously been highlighted during Operation Granby. Arguably, with its PJHQ, deployed NCHQ and individual contingent headquarters, the UK command structure had too many layers. During Telic, a small minority questioned whether the NCHQ was necessary. Although both CDS and the Chiefs of Staff supported the NCHQ concept, CJO was unhappy to find that his influence waned within CENTCOM after the NCHQ arrived in the Gulf and CENTCOM itself deployed forward. To the UKLCC, the NCHQ seemed to represent an extra link in the command chain that caused inertia.

On the other hand, the NCHQ's abolition would have required elements of PJHQ to deploy to the Gulf in its place if a single commander, positioned in theatre, was still to represent all three deployed UK contingents. It would then have been necessary for the (deployed) PJHQ to deal with each of the UK FLCs and the MOD from overseas. Clearly, the implications of such a change in UK command arrangements would have been far-reaching; where communications alone were concerned, the challenges would have been daunting. The approach

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76. 'A' day was the first day of the air campaign while 'G' day was the first day of the ground campaign.

77. KI/CAS – Kill-Box Interdiction/Close Air Support.

employed in Granby and Telic did at least offer the advantage of a single chain between the deployed and UK headquarters, as well as, in PJHQ, a conduit in the UK linking the MOD and the FLCs with deployed forces. Interestingly, the UK Air Contingent Commander (UKACC), far from questioning the role of the NCHQ, argued that it had been empowered too late (20 February 2003) by CJO. In his view, this exerted an adverse effect on both the management of UK force deployments and the C2 of deployed forces.

## **Deployment**

When planning for the prospective operation in Iraq began, PJHQ assessed that the US might possibly commence hostilities as early as October 2002. However, primarily to ensure the participation of the UK and other countries in a coalition against Iraq, the US began a concerted diplomatic effort in the UN to bolster the case for military action. The decision to 'follow the UN route' pushed back the start of any conflict into early 2003. This delay did provide both the US and the UK with valuable additional time to complete their preparations, but it introduced a second critical uncertainty into the process at the same time, adding to the difficulties caused by CENTCOM'S determination to open a northern front.

Ultimately, the UN Security Council passed Resolution 1441 on 8 November, declaring Iraq to have been in 'material breach' of earlier disarmament resolutions, insisting on the provision of a full declaration of WMD holdings and demanding the resumption of weapons inspections. In December, Iraq produced what it claimed was an accurate and complete declaration of its WMD and weapons delivery programmes, but the UN Monitoring, Verification and Inspection Commission (UNMOVIC) reported on the 19th that that this declaration fell short of the full, final and complete disclosure required. Up to this point, it had been difficult for the UK to embark on open preparations for war, but a more visible build-up now started.

Early in 2003, it became clear that Turkey would not provide basing in the event of hostilities with Iraq, and UK deployment plans were extensively revised. Alternative base facilities for 18 GR4s at Al Udeid airfield were requested from Qatar, and PJHQ worked with CENTCOM to secure basing for the E-3D and VC10 detachments in Saudi Arabia, for more tankers in Bahrain, and for 12 GR7s in Kuwait. A planned and routine Operation Resinate deployment of four GR4s to Ali Al Salem on 27 January was used as a first step towards enlarging the detachment, and six GR4s engaged in pre-deployment training in Cyprus were held there, pending movement to the Gulf. Ultimately, the larger GR4 detachment was established at Ali Al Salem and 12 aircraft were based at Al Udeid.

The objective was now to deploy the UK Air Contingent into theatre during the second and third weeks of February to reach full operational capability by 3 March. This was thought to be the earliest possible date for the start of the air campaign. However, to achieve this deadline, the UK needed basing agreements

with Kuwait, Qatar, Bahrain, Saudi Arabia and Jordan, ground equipment had to be conveyed to the Gulf – largely by sea – and it was necessary to complete protracted Omani and Saudi diplomatic clearance processes. By 31 January, Kuwait, Bahrain and Jordan had agreed to provide the requested base facilities, although Jordan was insisting that aircraft bound for Azraq should not deploy until the coalition had taken the political decision to initiate hostilities. By 4 February, it was assessed that Qatar would accept the UK basing request, and reports from Washington suggested that a decision on military action would probably be delayed by US deployment hold-ups and international pressure to give UNMOVIC inspections more time. The original UK deployment timescales could therefore be extended.

In the meantime, from 20 January, a staff that combined elements of the JFACHQ, the standing Operation Resinate (South) Headquarters, and additional augmentees, established the UK Air Contingent Headquarters (UK ACHQ) for Operation Telic. The AOC 1 Group, Air Vice-Marshal Glenn Torpy, assumed his appointment as UKACC on 9 February. The ACHQ was structured as follows:

A1	-	Personnel
A2	-	Intelligence
A3	-	Air Operations and Force Protection
A4	-	Logistics and Infrastructure
A5	-	Strategy and Plans
A6	-	CIS
A8	-	Contracts/Civil Secretariat

The A2, A3 and A5 cells comprised the operations section of the headquarters, while the A1, A4, A6 and A8 cells made up the support section. The headquarters ultimately numbered some 220 personnel, including support staff. Additionally, 55 personnel were fully embedded in the CAOC. The RAF's resources of trained air C2 manpower were thus stretched to the limit, and the number of targeteers proved barely adequate. The subsequent air lessons report recorded that this was a problem that had been repeatedly identified in the past and recommended that 'the requirement for trained targeteers in crisis operations should be properly scoped and measures taken to train and track the numbers required.'



Air Vice-Marshal Glenn Torpy, UK Air Contingent Commander during Operation Telic.



Air Chief Marshal Sir Brian Burridge; as Air Marshal, he was UK National Contingent Commander during Operation Telic in 2003.



Group Captain Mike Harwood, Deployed Operating Base Commander, addressing coalition personnel during the opening of the Harrier base at Ahmed Al Jaber, Kuwait, 2 March 2003.



A Harrier GR7 at Al Jaber, 8 March 2003, with considerably more under the wings.

Nevertheless, the ACHQ and embedded RAF CAOC staff are said to have exerted a considerable influence on the conduct of the air campaign at the operational and tactical levels. The CFACC was content to put UK officers into senior CAOC positions – a reflection not only of the credibility and experience of the officers concerned but also of the trust and respect that had built up between the RAF and the USAF on the basis of near-constant collaboration since 1990.

The deployment of the UK Air Contingent was by no means straightforward. The UKACC believed that the task of establishing his headquarters should have been completed well before the various force elements began to deploy, and subsequently maintained that too many decisions on the structure of his force had been taken in the UK. In his view, specific theatre requirements should have been more influential: there was ‘too much “UK push” rather than theatre pull’. He also recorded:

The most notable issue has been the inability to build up forces at the pace we would have liked due to the lack of Diplomatic Clearances to bring personnel, equipment and aircraft into the host nations involved. The build-up of the aircraft detachments and the UK ACHQ at Prince Sultan Air Base in Saudi Arabia has been particularly badly affected, but Azraq in Jordan, and Al Udeid in the UAE have also suffered.

Daunting logistical hurdles had also to be overcome. The ACHQ recorded that ‘the size of the task, together with fragile communications, has caused difficulty in maintaining visibility of exactly what equipment has been scheduled to arrive where and when, whether moving by sea or air.’ Seaborne equipment packages originally prepared for Turkish bases (and which, of necessity, left the UK before the Turkish option was ruled out) were inevitably not optimised for the revised basing arrangements. DOB commanders complained that enabling equipment and personnel arrived in the wrong order and at short notice. Hub-and-spoke air transport operations centred on the UAE base at Fujarah (but originally planned for Akrotiri) did not begin as early as had been hoped. Difficulties securing diplomatic clearance then disrupted flying and led to the accumulation of a four-day backlog of freight movement. Shortages of weapons and Ground Support Equipment (GSE) delayed the establishment of full operational capability at Al Udeid and Prince Sultan Air Base (PSAB), and some redistribution was required from Ali Al Salem and Bahrain respectively; GSE sent to PSAB from the UK, which reached Bahrain by sea on 10 March, was not delivered until the 17th because of further ‘dipclear’ problems. NBC stores proved inadequate and were unevenly distributed between force elements.

The early stages of the deployment were also beset by chronic communications problems at ACHQ level – both forward to the DOBs and back from the headquarters to the UK. According to the subsequent air lessons report,

Communications bearers and gateways were insufficiently robust, and the multitude of different CIS, across the operational, intelligence and support communities, meant that it was difficult and often impossible to communicate between UK Organisations ... In addition, there is little interoperability with US systems and a key concern was a lack of connectivity or access to SIPRNET.

The UKACC would later identify CIS as his gravest area of concern in his personal evaluation report on Operation Telic, but he recorded as early as February 2003 that his headquarters had 'paid the price for past lack of investment in robust communications, with literally days of being unable to place secure calls through the Whitehall exchange'. Data communications had not fared much better.

Of course, many early teething troubles in the communications sphere were ultimately resolved, but the more fundamental weaknesses within the UK CIS infrastructure could not be rectified in the middle of a major operation. The urgent need for a single robust defence-wide system was perhaps the most prominent lesson identified from the operation. By contrast, the other physical deployment obstacles were overcome in due course. By March, only the GR7s bound for Azraq in Jordan were still giving the UKACC legitimate cause for concern: the Jordanians were refusing to permit their deployment until five days prior to A-Day, whereas Air Vice-Marshal Torpy wanted seven days to give sufficient time for theatre familiarisation and training. Not until the 9th was Jordan finally persuaded to admit the detachment, which duly flew in from Akrotiri that evening.

### **Air C2 and the Southern No-Fly Zone**

Against a background of mounting international tension, the second half of 2002 witnessed a marked increase in the intensity of air operations in the Iraqi NFZs. Sometimes described as 'spikes', they led Iraq to deploy more SAMs into the Southern NFZ, and there were increasingly frequent SAM launches against coalition aircraft, which duly gave rise to a growing number of so-called Response Options – coalition attacks on Iraqi targets. The increase was so pronounced that the more senior RAF officers in theatre began to suspect that a transition might be taking place from extended NFZ activities to preparatory actions for the contingency of the operation that became Telic. The record of the UK Air Headquarters noted in November that 'the UK position within the coalition ops had to be carefully guarded to remain within the Op RESINATE (S) remit and not stray into preparation for a possible action against Iraq.'

That US objectives now extended beyond the immediate parameters of Southern Watch was also apparently reflected in a new CONOPS introduced in November. Analysis of the so-called CONOPS 2003 undertaken by PJHQ and

the MOD concluded that it was chiefly concerned with the expansion and rationalisation of targeting delegations from Washington down to the Combined Joint Task Force Operation Southern Watch. CENTCOM was said to have no imminent plans for *expanding* the Southern Watch target set. Yet the new CONOPS did provide for strikes against ‘targets from the CENTCOM-approved Response Option target list *or targets other than those on the CENTCOM-approved Response Option target list.*’<sup>78</sup> It was also noted that the US Secretary of Defence’s authorisation signal for a parallel US EUCOM CONOPS 2003 for Operation Northern Watch referred specifically to

ONW<sup>79</sup> responses to align with OSW<sup>80</sup> CONOPS 2003 to increase flexibility, expand latitude on timing of strikes, and *shape battlespace for possible future operations.*<sup>81</sup>

Yet the reality seems largely to have been that the Response Options, while increasing in intensity, still struck the type of air defence sites that had been targeted almost continuously since 1998. Moreover, they remained confined to southern Iraq. RAF assets in the Gulf continued to operate in accordance with an earlier CONOPS – CONOPS 2001 – and, by the end of the year, this had only led to their exclusion from Response Options on a few occasions. The most notable of these, on 26 December, involved multiple strikes on Iraqi targets following a violation of the Southern NFZ and the destruction of a Predator UAV.

However, during January, US timelines for the launch of OPLAN 1003V began to slip. At the end of 2002, US planning still envisaged that a short preliminary air campaign preceding a ground offensive into Iraq would be launched late in February, but the UK Chiefs of Staff were advised on 15 January of ‘a possible marginal shift to the right’ for the American political decision to go to war. The delay was apparently required to give more time both for military preparations and the political process – i.e., the presentation of a case for war based on UNMOVIC’s expected failure. Furthermore, ‘the gap between A and G-Days had been compressed so that G-Day was now assumed to be A+5 (8 Mar).’

As the weapons inspection and UN processes ground on, the timetable slipped again. In mid-February, the Chiefs of Staff learnt that the CFLCC was working towards a G-Day of 15-16 March only slightly preceded by A-Day. This scenario was effectively confirmed on 22 February, when the US administration took the political decision to launch OPLAN 1003V in mid-March. Ultimately, citing the authority of UNSCR 1441, the Americans prepared an ultimatum

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78. Author’s italics.

79. ONW – Operation Northern Watch.

80. OSW – Operation Southern Watch.

81. Author’s italics.

demanding that Saddam Hussein leave Iraq within 48 hours or face military action. It was issued on 17 March, making the 19th D-Day for OPLAN 1003V.

The revised timetable confronted the CFACC with a fundamental problem. As the time allowed for the preliminary air campaign was compressed, he found himself facing the formidable challenge of discharging his five main tasks (see above) almost simultaneously. He was given hardly any time to shape the battlespace or dismantle Iraq's most capable array of GBAD around Baghdad – known as the Super-MEZ – which was crucial if the Republican Guard divisions protecting the Iraqi capital were to be targeted effectively. It must have appeared eminently sensible in these circumstances to conduct at least some shaping operations under the Southern Watch banner through the medium of Response Options, and the number of Response Options certainly multiplied further during January. They remained, overwhelmingly, responses to Iraqi actions threatening coalition forces engaged in patrolling the Southern NFZ, but it was not difficult to provoke the Iraqis and draw a reaction that could be used to justify a Response Option. Such shaping as occurred via this means was still largely confined to dismantling the IADS in southern Iraq, but certain exceptions were made for very high pay-off targets that would have a significant operational-level impact or save coalition lives later on.

The RAF's contribution to these operations remained governed by the Operation Resinate TD and ROE, but the number of kinetic strikes conducted by the GR4s was in any case reduced in this period to conserve weapon stocks. There were no clear grounds for relaxing UK targeting restrictions purely to allow GR4 participation in shaping actions. However, when the US depended on the UK for particular facilities or tasks, the situation was more complex. On at least one occasion, the UK refused to allow B-52s located on the British island of Diego Garcia to participate in a Response Option; on another, the UK proved unwilling to support so-called 'intrusive' ISR operations, which would presumably have strayed some way beyond the areas normally covered by Resinate (South) reconnaissance tasking.

RAF officers at PSAB remained concerned that the Americans were 'pushing the ROE on Op Resinate South to shape the battlespace' and that 'the UK military position is restrained by ROE.' Elements within the US command chain also periodically showed signs of frustration over the UK's stance. Immediately after assuming his post as UKACC, Air Vice-Marshal Torpy wrote to PJHQ:

We do not appear to have developed a plan for how to align our military posture under Op Resinate with the political and diplomatic lines of operation ... It is becoming increasingly untenable – certainly at the tactical level – for the UK to operate within the existing Op Resinate mandate, when the US is starting to expand the scope of Op Southern Watch.

As the build-up of American and British forces in the Gulf gathered pace, the CFACC produced plans to triple the length of time spent by coalition aircraft in Iraqi airspace and organise larger coalition packages. One of his paramount aims was allegedly to ‘desensitise’ the Iraqis by confronting them with forces and flying patterns similar to those that would ultimately be employed if Iraqi Freedom was implemented. Against this background, more than a month before the start of the operation, the UKACC felt obliged to warn PJHQ

That there are some in Whitehall who may not appreciate that as far as the CFACC is concerned he is already into 1003V Phase 2 – Shaping the Battlespace – and the drive to bring A and G Day closer together will require this preparation to become increasingly aggressive in order to deliver the conditions for G Day.

Air Vice-Marshal Torpy urged the revision of the Operation Resinate TD and ROE. He was anxious to ensure that aircraft and crews embarked on a balanced programme of Resinate flying and training as they arrived in theatre.

In the UK, the MOD soon accepted that a limited change in the TD was necessary but not as a precursor to the initiation of Operation Telic. Rather, a change was required to delegate to theatre the authority to take action against Iraqi forces deemed to be threatening deployed units. On 11 February, several Iraqi Ababil-100 surface-to-surface missiles were spotted in the Southern NFZ. A Response Option was proposed involving RAF GR4s, but the UKACC had to refer the issue to PJHQ (at 0500Z), and PJHQ considered that ministerial approval was required. This was not received in theatre until 1115Z. In the event, the delay was of no significance because poor weather prevented Southern NFZ operations that morning, and it proved impossible to attack the missiles until 1550Z; they were reportedly ‘totally destroyed’ by Tornado GR4s and F-16CGs. Yet the episode clearly demonstrated that some further targeting delegations were needed, and the following paragraph was therefore added to the Directive:

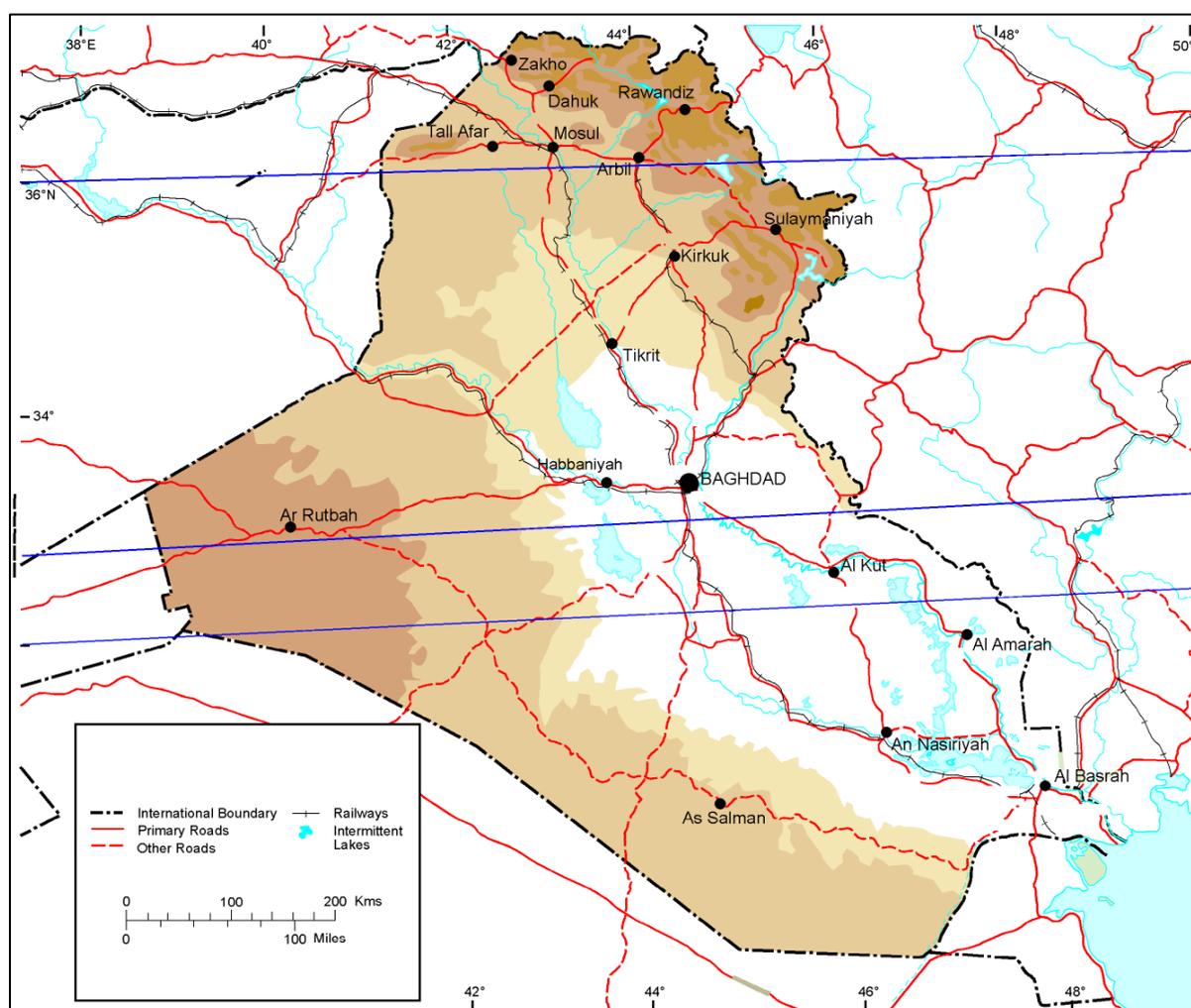
Attacks against artillery, rocket or missile systems are authorised where there is a clear and direct threat against coalition forces on the ground (in other words, systems identified are operationally deployed; in a location where they are able to engage coalition ground forces; and when CBF (R-S)<sup>82</sup> is satisfied that there is a clear, direct and specific threat to the forces in question).

But changes in the ROE were another matter. From the MOD’s perspective, UK forces sent to the Gulf for the contingency of Operation Telic deployed without ROE because their role was to *deploy* rather than to *fight*. Telic ROE were said

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82. CBF (R-S) – Commander British Forces Resinate (South).

to be 'in a mature state and could quickly be finalised if ops started', but the forces concerned could only fight in support of their inherent right of self-defence in the meantime. Changes in ROE designed to smooth the transition from Resinate to Telic were not compatible with the government's position that no decision had been taken to go to war, and with its determination to observe the weapons inspection and United Nations processes before committing the UK to hostilities. Moreover, at the time, the precise legal basis for taking military action to disarm Iraq was still under discussion.



Iraq, showing the original Southern NFZ, the Southern NFZ as extended in 1996, and the Northern NFZ.

At the MOD, the Overseas Secretariat (after thorough consultation with PJHQ) therefore advised the Secretary of State that no threat had been identified that required 'additional ROE to be developed for any of the three components in advance of offensive Telic operations'. Furthermore, although it had been suggested that the US would use NFZ operations as a cover for preparing the battlespace prior to the launch of OPLAN 1003V, 'none of these risks have come to fruition since the build-up of US forces began.' It was agreed that the rotation of Telic forces through Resinate for operational training purposes might be considered, but no firm decision on combining the two could be taken as yet.

However, where ISR assets were concerned, the position was less clear-cut. In February, a Nimrod R1 was authorised to commence operations in the Gulf in support of Operation Telic, but 51 Squadron subsequently recorded that their missions, which began on 4 March, were conducted under the existing Operation Resinate (South) mantle. Meanwhile, the Canberra PR9s were authorised to fly in support of Telic rather than Resinate. They deployed to Akrotiri on 25 February and flew a reconnaissance sortie over the Jordan-Iraq border on the 27th, routing via Israeli and Jordanian airspace. Effectively, this was the first operational sortie flown by the RAF in support of Telic. These operations continued from Akrotiri and were later flown from Azraq, after 39 Squadron was permitted to deploy there on 4 and 5 March. They were not included in the Southern Watch ATO until the 16th.

The UKACC remained far from content with the situation. As late as 28 February, he addressed a point brief to the NCC detailing alleged 'backward leaning' by the MOD regarding the transition from Operation Resinate (South) to Telic. The revised TD only reached the Gulf on 1 March but did 'better align UK ops and US intent on OSW' and there was apparently 'renewed acceptance by US leadership at PSAB that the coalition should not plan to attack a DMPI<sup>83</sup> which had been declared by the UK as a "NO".' On 3 March, the MOD authorised aircraft deployed on Operation Telic to participate in Resinate (South), although Qatar would not allow this provision to be extended to the Al Udeid GR4s; the UKACC clearly felt that the MOD might have done more to secure Qatar's co-operation. In the event, the detachment was unable to fly on Resinate (South) until the 16th, which left minimal time for live operational training in theatre. Even their theatre familiarisation flying had to be confined to Qatari airspace.

Fortunately, most of the other detachments forming the UK Air Contingent were able to take full advantage of the changed situation when 24-hour operations began on the 4th. The CFACC's CONOPS now involved spreading a series of packages over each 24-hour period but conforming as closely as possible otherwise to established operating patterns, avoiding any dramatic increase in the number of Response Options and thus, in theory at least, not arousing excessive Iraqi alarm. According to one source, the intention was 'to provoke a tolerance

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83. DMPI – Direct Mean Point of Impact, essentially the aiming point within a target.

of 2-3 day high sortie rates in Iraq over the next few weeks'. US planners were warned that the CFACC attached the greatest importance to maintaining coalition and international support, and the targeteers were 'reined in'. This was welcomed at the UK ACHQ as it promised 'to ensure a more measured approach to the transition from OSW to 1003V'.

In addition to the GR4s at Ali Al Salem and the F3s at PSAB, which were already involved in Resinate (South), several force elements deployed for Operation Telic were now included in the ATO, such as the Nimrod R1, VC10 and E-3D detachments. Given the advent of 24-hour operations, this raised obvious difficulties when the US proposed Response Option targets that the UK considered inconsistent with Resinate objectives. Clearly, mission-critical assets like the E-3Ds could not simply be withdrawn, as they had been when operations were only conducted for a limited period each day. The only alternative was for them to remain in place on the basis that they were not directly participating in the US attacks.

By 12 March, the Al Jaber GR7s were also involved in the operation, but a lack of diplomatic clearances prevented the aircraft based in Jordan from flying Resinate sorties until the 16th. Only the Ali Al Salem GR4s were committed to Response Options, no other RAF aircraft releasing weapons against Iraqi targets before the start of Operation Telic.

### **Air C2 in the Second Gulf War**

By the second week of March, coalition planning had compressed A-Day and G-Day to such an extent that they were eventually scheduled to take place at the same time – on D+2. This was partly because the US administration desired the shortest possible period of live hostilities and believed extensive battlespace preparation was unnecessary given the relative strengths of coalition and Iraqi forces. The CFLCC may also have considered that large-scale preliminary air strikes, while desirable to degrade enemy ground forces, might warn the Iraqis of the impending assault and give them an opportunity to sabotage the all-important oil fields before coalition forces began their advance. Equally, it was believed in some quarters that an air campaign designed to achieve shock and awe might undermine coalition Information Operations (IO) by causing civilian casualties and collateral damage, and that the destruction of Iraqi infrastructure might significantly complicate the task of post-war reconstruction.

At the ACHQ, the days preceding the outbreak of hostilities were dominated by last-minute planning for the opening phase of Operation Telic. Work on clearing OPLAN 1003V targets started on 9 March, and the UKACC also instituted table-top targeting exercises, in his words, 'to ensure that we have robust targeting and clearance procedures in place'. He himself participated in a CENTCOM VTC table-top exercise intended to 'war-game' the early days of the campaign on the 12th. At the same time, ATOs were being prepared covering D-

2 to D+4. This proved extremely difficult because of the prevailing uncertainty about how 1003V would actually begin – how the political and military processes would be synchronised, how A-Day would be co-ordinated with D-Day and how the end of Resinate (South) would lead into the beginning of OPLAN 1003V. A MAAP for the A-Day ATO was finally briefed to the CFACC on 13 March but changes were being introduced into some of the other ATOs for this critical period as late as the 18th. Ultimately, it proved necessary for the UK ACHQ to prepare a variety of Air Operations Directives to cover the range of circumstances in which hostilities might start. ‘Not wholly unexpectedly, much of this planning proved to be nugatory.’

The UKACC duly adopted the Operation Telic ROE on 19 March at 1800Z – the same time as the Americans switched to the ROE for OPLAN 1003V. However, air planning was again in a state of flux by that time, the Commander CENTCOM having ‘initiated branch planning to accelerate the ground plan from 48 hours to 24 hours [from the start of Op Telic] in anticipation of an early collapse of the Iraqi 51st Division in the South’. In other words, he now envisaged that G-Day would actually *precede* A-Day, which was still scheduled for the 21st. As some unknown comedian in the CAOC put it, ‘A before G, except after D.’

This had profound implications for A-Day because a MAAP designed to contribute independently to the achievement of shock and awe could hardly be appropriate to a situation in which large-scale ground operations had been in progress for more than 24 hours. Ultimately, numerous missions scheduled for the opening stages of Telic were cancelled altogether, and much of the targeting associated with shock and awe was abandoned. Similarly, the Baghdad Super-MEZ was left intact and was not systematically targeted for several days – a striking reversal of the order of events normally associated with air campaign planning.

In the initial coalition offensive, V Corps drove north-west along the western bank of the Euphrates river while 1 MEF and 1 UK Armoured Division concentrated on securing southern areas of Iraq, including the port of Umm Qasr, the Rumaylah oilfields, the Al Faw Peninsula and Basra. Responsibility for this area then passed to 1 UK Armoured Division, freeing the bulk of 1 MEF to follow V Corps as far as Nasiriyah, where they crossed the Euphrates and advanced north. The campaign then developed into a headlong rush for Baghdad.

For the deployed RAF units, the revision of coalition planning in this period overturned a number of earlier assumptions. The GR4 and GR7 detachments arrived in the Gulf expecting to fulfil a variety of roles, including attack, interdiction and CAS. In the event, they received – at most – two or three days of pre-planned tasking before being switched to CAS or, to be more precise, KI/CAS, standing for Kill-Box Interdiction/Close Air Support. KI/CAS was a US Marine Corps (USMC) concept, which was adopted by the CFACC for the operation. The whole of Iraq was divided into kill-boxes measuring 30 minutes north by 30 minutes east. Each box was then subdivided into nine equal squares

resembling a telephone keypad. Operations were planned into individual kill-boxes with set rules for entry and exit.

Outside a Fire Support Coordination Line (FSCL), some distance beyond the Forward Line of Own Troops (FLOT), aircraft were cleared to attack any targets they could find in their assigned kill-boxes – assuming they had been declared ‘open’. If they were ‘closed’, aircraft could only attack under positive direct control, normally from a FAC. Inside the FSCL, kill-boxes were automatically closed unless opened with the agreement of the CFLCC. In the absence of such agreement, they were subject to three types of CAS, all of which necessitated positive direct control of the aircraft. Type 1 required the terminal controller to have sight of both the aircraft and the target – a rare occurrence during the campaign; Type 2 required the terminal controller to have sight of either the aircraft or the target, while Type 3 enabled air strikes to take place when the terminal controller could see neither aircraft nor target. This typically occurred when a forward ground unit reported the location of a target to a terminal controller in radio contact but not visual contact with both the ground unit and the attacking aircraft.

For the GR7s committed to Counter-TBM, a slightly different system was employed. Western Iraq was divided into four Areas of Operation (AOs), each being assigned to specific SF elements. Each AO included a number of Joint Special Operations Areas (JSOAs), which corresponded with the kill-box grid system employed by coalition air forces. SF within the JSOAs were responsible for searching them for Scud activity and were also protected by strict fire support control measures – a vital safeguard against fratricide. Outside the JSOAs, fire support control measures could also be applied, but they were less rigid and air assets were responsible for the Scud hunt.

The contrast with the RAF’s experience in Granby and in post-Granby operations in the Gulf could hardly have been sharper. For more than a decade, crews had been accustomed to extensive mission planning and pre-briefing on their targets, as well as target folders containing up-to-date photographs, intelligence and other mission-specific information. In the KI/CAS role, on the other hand, aircraft were simply dispatched to a kill-box to await any tasking that became available; the GR7s committed to Counter-TBM were sent out to observe potential Scud hide sites. Detailed targeting information normally only emerged during transit to the target area.

Other functions associated with pre-planned targets, such as the application of the TD and the selection of weapons – previously undertaken by the CAOC – were delegated to the cockpit during KI/CAS missions on top of more familiar requirements, such as the location and positive identification of the target. Moreover, the critical tactical control function of assigning aircraft to targets was handed off to the Marine Expeditionary Force’s (1 MEF’s) Tactical Air Operations Centre, the US Army’s V Corps ASOC, and, for Counter-TBM, the Special Operations Task Force’s Joint Fires Element.

This sudden, large-scale and high-intensity transition from pre-planned to dynamic tasking raised acute difficulties; the fact that small, mobile, tactical targets were involved – often in dispersed, concealed or urban locations – complicated matters further. The search for solutions was not helped by poor liaison between the different components. Intelligence was a particularly vital commodity in a campaign of this nature, yet the analysis and exploitation processes took far too long. As the UK air lessons report noted, ‘The US has an enormous ISR collection capability, but the fusion of data seems neither to work in a timely fashion nor provide the operational community with the information it requires.’ As in Granby and Allied Force, the production of BDA had ‘lagged so far behind that it could not be used to either adjust the campaign plan or inform targeting decisions.’

Ultimately, significant numbers of coalition combat aircraft were left untasked or were unable to attack assigned targets for other reasons and returned to base with their weapons. This quickly became a source of concern at higher levels of the coalition command chain. The UKACC complained of ‘poor control of assets by ASOC V Corps’ and noted that aircraft operating in support of 1 MEF were more likely to be allocated targets. As V Corps drove rapidly north towards Baghdad, some aircraft also found themselves operating beyond the effective range of the ASOC’s communications.

However, work was already ongoing to enhance KI/CAS procedures, and some aircraft were being assigned pre-planned or alternate targets. These tended to be fixed targets with predetermined GPS co-ordinates, such as headquarters, barracks and depots to which troops or equipment might have been dispersed. So-called ‘bomber boxes’ were also introduced, where aircraft could release unguided weapons against low collateral damage targets.

The V Corps ASOC was asked to conduct an urgent review of its CAS procedures in an attempt to reduce the number of combat aircraft left untasked, and aircrew subsequently noted an improvement in the ASOC’s performance. In due course, it moved north to Tallil, in southern Iraq, to improve communications with forward areas. At the same time, ISR and AAR assets that had been held south of the Iraqi frontier for their own safety were permitted to orbit over the border area to improve intelligence supply and on-station time for KI/CAS assets. Soon, some of these aircraft began operating inside Iraqi airspace despite the risks involved.

Nevertheless, notwithstanding what the UKACC referred to as ‘process improvements in KI/CAS’, things were still ‘far from perfect’. Over the course of 30 and 31 March, he visited Ali Al Salem, Al Jaber and Al Udeid and found the GR4 and GR7 detachments ‘frustrated by the execution of KI/CAS missions’. He subsequently convened an operations/tactics seminar on KI/CAS at the UK ACHQ and recorded:

The areas that require particular attention are communications (aircraft are frequently passed to 10-15 different agencies before reaching the correct controller), the V Corp ASOC's performance, availability of Kill Box imagery and the prioritisation and flow of aircraft between the MEF and V Corps, and individual Kill Boxes. We also need to sharpen up the ISR process so that imagery from the likes of RAPTOR and PR9 is rapidly exploited for TST<sup>84</sup> and dynamic tasking. At the moment far too much time is lost in the ISRD,<sup>85</sup> when a simple phone call from the detachment to the CAOC floor could at the very least direct aircraft into areas of known military activity.

Ultimately, at least some of these deficiencies were addressed by circumventing the established command channels and processes. For example, some direct transfer of RAPTOR and PR9 imagery occurred to both UK and US force elements to permit more rapid analysis and exploitation. At detachment level, Harrier Force South succeeded in obtaining more alternate targets, and these were regularly attacked if no dynamic KI/CAS tasking was available. They were identified through the combined efforts of their Mission Support Cell (MSC) and the DOB Intelligence Cell, as the CAOC did not provide secondary targets when aircraft were tasked with CAS. This involved careful study of future ATOs to establish the location of assigned kill-boxes, and close liaison with the 1 MEF Deep Strike Cell – also conveniently based at Al Jaber. If the location of possible targets was confirmed by the Deep Strike Cell, the MSC's commanding officer (who was also the 4 Squadron Ground Liaison Officer – GLO) would attempt to match the information with any available imagery of the areas covered. If the secondary targets were fixed, he could also clear the Collateral Damage Estimate (CDE) with the CAOC and relieve the pilots of this responsibility. Alternate targets were also identified by 1 (UK) Armoured Division's Air Cell.

On the ground, progress slowed during the last week of March. Commander CENTCOM subsequently felt that V Corps and 1 MEF had focused too much attention on seizing ground rather than destroying enemy forces. It became clear that their extended lines of communication were vulnerable to attack and that measures had to be taken to ensure their security. Iraq's best Republican Guard divisions were known to be defending the southern approaches to Baghdad; it would have been unwise of the CFLCC to launch a major ground assault against them while his supply lines were threatened, and neither corps was at first strong enough to execute such a task. The weather also turned against the coalition, central and southern Iraq being hit by violent and prolonged sandstorms between 24 and 26 March. By the 28th, a more-or-less formal pause in the ground

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84. TST – Time-Sensitive Targeting.

85. ISRD – Intelligence, Surveillance and Reconnaissance Division.

offensive had been called. Plans to move against the Republican Guard divisions were postponed from the 29th to 2 April to allow V Corps and 1 MEF to marshal their resources for the forthcoming ‘Battle of Baghdad’.

The Air Component was thus handed an unexpected but welcome opportunity. During this period, strikes on the so-called Super-MEZ substantially degraded Iraqi air defences around Baghdad, although the CFAC began to suspect that their capability had been overestimated by coalition intelligence earlier in the operation; they rarely presented much direct threat to coalition aircraft. By 31 March, he was referring to Baghdad and its environs as a ‘threat area’ rather than a MEZ. Over the following days, Iraqi early warning cover began to disintegrate, and the number of SAM launches steadily declined.

Meanwhile, coalition air power relentlessly targeted the Republican Guard. The Baghdad Division was reduced to an estimated combat effectiveness of just 10 per cent. Comparable figures for the other five divisions were:

<b>Republican Guard Division</b>	<b>Per cent combat effective</b>
Medina	25
Adnan	55
Hammurabi	55
Nebuchadnezzar	70
Al Nida	70

The divisions that suffered least apparently reduced their vulnerability to air attack by employing such far-reaching dispersal and concealment measures that their combat capability was also substantially undermined. Thus, the Republican Guard and other formations south of Baghdad were rendered incapable of effective resistance – a fact that became all too clear when the ground offensive resumed. The anticipated set-piece battle for the Iraqi capital simply failed to materialise.

As V Corps and 1 MEF closed on Baghdad and Iraqi resistance crumbled, coalition air forces were confronted with the prospect of the FSCL being extended north of the Iraqi capital and with virtually all fires short of this line having to be co-ordinated and controlled. Baghdad was carefully mapped and divided into zones; each zone was then subdivided into sectors, and GPS co-ordinates were produced for every building. The tactics appropriate for Urban CAS over Baghdad now became the focus of attention at the UK ACHQ and at detachment level.

At the same time, the UKACC became concerned that the procedures formulated to manage the flow of aircraft into the restricted battlespace would not sufficiently address the increased risk of blue-on-blue engagements, mid-air collisions and collateral damage. This latter problem was particularly worrying because the smallest PGM in the UK inventory was the 1,000lb

Paveway/Enhanced Paveway 2.<sup>86</sup> Paveway 2 could be very accurately directed at a single building, but its explosive force often threatened to cause at least some damage beyond the immediate boundaries of the target. In short, it was not especially suitable for employment in an urban environment. In an attempt to find a rapid solution, proposals emerged for using inert Paveway or Enhanced Paveway 2 bombs, and the UK ACHQ submitted a request for their dispatch to the Gulf as a matter of the highest priority on 3 April. However, in practice, it was found that troops on the ground requesting air support preferred the effect of conventional explosive and would assign any available tasking to US aircraft if the RAF could only offer them inert weapons.

Coalition forces took control of Baghdad over the following days, and air tasking over the Iraqi capital then declined considerably, but there was some intensification of operations in northern Iraq. Airborne troops had landed at Bashur Airfield on 26 March, and coalition SF were also infiltrated. The aim was to safeguard Iraq's oil fields around Kirkuk, uphold her territorial integrity and further her military defeat by preventing forces in northern Iraq from reinforcing Baghdad. As the airborne and SF units lacked heavy weapons, they were largely dependent on air power for fire support. The CFACC also decided to target Tikrit from the air independently. As the city was Saddam Hussein's spiritual home and a base for other members of his government, he believed that this would signify to the Iraqi people and to members of the armed forces the coalition's determination to remove the regime.

Hence, as air tasking in support of V Corps and 1 MEF began to slacken, operations over northern Iraq gathered momentum. Approximately 29 per cent of the air effort in the 5 April ATO was assigned to the north. This change of emphasis produced a limited amount of additional tasking for the RAF detachments, although the NCC ruled, on the basis of his TD, that they should not strike targets in the Tikrit area that were merely regime symbols. Ultimately, the fall of Saddam Hussein's regime during the second week of the month brought hostilities to an end.

From an air perspective, Operation Telic will always be associated above all else with the trials and tribulations of KI/CAS. To many, the high weapon bring-back rate and the difficulties experienced by the various tactical C2 agencies were extremely troubling. The coalition air forces appeared poorly prepared for the KI/CAS task whereas the US Marine Corps, with their organic air capability, seemed far more proficient. On this basis, the continued efficacy of centralised air C2 was challenged in some quarters after the conflict. At its worst, this critique involved a fundamental misrepresentation of the ATO system which, it was claimed, rigidly tied aircraft to specific duties three days in advance.

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86. Enhanced Paveway 2 incorporated GPS guidance as well as Paveway 2's conventional laser guidance.

In fact, the vast majority of combat aircraft were assigned by the ATO to dynamic tasking in support of the Land Component and not to specific pre-planned attacks. Moreover, there is a case for arguing that tangible gains might have resulted from more rather than fewer pre-planned air strikes. As we have seen, the lack of tasking for aircraft assigned to KI/CAS ultimately resulted in numerous *ad hoc* attacks on secondary targets. Many of these were fixed facilities and could have been targeted far more economically and effectively by a conventional planned air campaign; at least some had in fact been removed from the A-Day ATO following the launch of the coalition ground offensive. Had such targets as HQ buildings and barracks been attacked during the opening days of Operation Telic, it is also more likely that they would have been occupied. In the event, by the time they were finally struck, most would probably have been empty.

Historically, the accomplishments of the USMC have undoubtedly been impressive where CAS is concerned, yet it is all too easily forgotten that they lack much air capability beyond the basic CAS role. While they may often benefit from very effective CAS, their organic air support provides little else. Moreover, the distribution of air assets on organic lines is always open to objection on resource-allocation grounds. Organic air assets that are not immediately required by the ground formation to which they are attached can be difficult to transfer to the support of other formations that have an immediate and pressing need for them. By contrast, via centralised command, available air assets can easily be apportioned in accordance with rapidly changing operational priorities.

The Counter-TBM story provides an illustration. Although, on paper, the air assets assigned to western Iraq were under the command of the CFACC, they were to all intents and purposes locked into the Counter-TBM/SF-support task. As their role was so clearly defined before the onset of hostilities, they were able to train and prepare for it very thoroughly. However, when the anticipated Scud threat did not materialise – and as the requirement for SF support began to decline – it was difficult to reassign them elsewhere. In any case, coalition commanders were unwilling to reduce the Counter-TBM air effort while the Iraqis retained their hold on particular areas that had long been linked to Scud-related activity, such as the border town of Al Qa'im. Consequently, while the RAF and USAF combat air detachments played a vital role in operations in the west, their strike rate was low even by the standards of Operation Telic.

This is not necessarily a criticism of the whole concept of organic air power; it is simply a reminder that it can often involve the commitment of very substantial resources to quite limited and specialised tasks. In short, organic air support is not cheap. The RAF's participation in Counter-TBM operations involved the permanent allocation of some 32 fixed-wing and rotary-wing aircraft as well as tankers and RAF Regiment personnel; Tornado GR4s based at Ali Al Salem also participated intermittently. USAF operations were mounted on a much larger scale.

It is also revealing to draw comparisons between GR7 operations flown from Azraq and those mounted by Harrier Force South from Al Jaber. Between 19 March and 14 April 2003, 3 Squadron flew 142 missions for 290 sorties from Azraq. Some 32 sorties released weapons and 73 weapons were dropped in all. Harrier Force South, between 21 March and 14 April, flew 179 offensive missions involving 367 offensive sorties (i.e., excluding reconnaissance missions with the Joint Reconnaissance Pod), 117 of which released a total of 265 weapons. In other words, 11 per cent of sorties flown from Azraq released munitions compared with 32 per cent of sorties flown from Al Jaber; 3 Squadron had to fly nine sorties per weapon release, whereas Harrier Force South had only to fly three.

These figures partly reflect the fundamental difference between the two detachments' respective tasks. While 3 Squadron aircraft took off each day to perform both the 'Non-Traditional' ISR (NTISR) and attack roles, a large part of the NTISR task was focused on one specific object – the Scud missile – which was not in fact deployed in western Iraq. By contrast, Harrier Force South's reconnaissance role was entirely separate from their attack role, and offensive missions were tasked to destroy virtually any legitimate Iraqi target that could be found. They also flew occasional pre-planned missions and benefited from the availability of more secondary targets than were allocated to 3 Squadron. Consequently, Harrier Force South aircraft were far more likely to be tasked against targets. However, their offensive capability was critically dependent on the availability of TIALD-capable aircraft and pods, and yet the over-riding priority attached to Counter-TBM compelled them to manage throughout the campaign with half the number of TIALD aircraft that was made available to 3 Squadron (four compared with eight), and with the same number of pods (five – initially four at Al Jaber). They faced a constant struggle to maintain these mission-critical resources.

Similar arguments could be applied where the Azraq PR9 detachment was concerned. Locked into an unproductive search of potential Scud hide sites, 39 Squadron personnel became increasingly doubtful about the value of their mission and began pressing for alternative tasking. However, the CAOC ISR collections staff responded with strong counter-arguments that emphasised the continued importance of the Scud hunt:

CFC<sup>87</sup> and CFACC continue to perceive that there is a possibility, albeit a slim one, that there could be a rogue launcher out there, hell bent on firing one off at Israel as soon as we drop our guard. As this would have huge strategic effect and is something that we want to avoid, until CFC and CFACC are convinced otherwise, the monitoring continues.

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87. CFC – The Combined Forces Commander, i.e., Commander CENTCOM.

Beyond offering such insights into the advantages and limitations of organic air power, Operation Telic also demonstrated once again the value of forward basing. When the Turkish option collapsed in January 2003, alternative basing arrangements had to be organised at very short notice. It was fortunate that Al Udeid could accommodate the second Tornado GR4 detachment in these circumstances. Nevertheless, the Al Udeid Wing faced a transit of about 900 km to southern Iraq – six times the distance that confronted the Combat Air Wing flying from Ali Al Salem – and this was a significant handicap.

Excluding reconnaissance missions with RAPTOR, Counter-TBM, Storm Shadow and ALARM tasking, the Combat Air Wing planned 324 sorties between 20 March and 15 April 2003; 309 sorties flew. The 309 sorties resulted in 148 weapon releases (48 per cent). By contrast, the 268 sorties flown by the Al Udeid Wing led to just 87 weapon releases – 32.5 per cent. If the data are confined to KI/CAS against fielded Iraqi forces before the virtual cessation of hostilities on 12 April, the results for the Al Udeid Wing would be based on 200 sorties, of which only 47 – 23.5 per cent – released weapons. Al Udeid's distance from Iraq provides the chief explanation for their lower strike rate. More unserviceabilities were experienced during the long transit north<sup>88</sup> and they were far more dependent than the Ali Al Salem GR4s on AAR to hold over Iraq while awaiting tasking. If they were tasked, the subsequent processes of target location, positive identification and clearance also took time, with the inevitable consequences in terms of fuel consumption. If AAR was unavailable, there was no alternative but to return to base. Well before hostilities began, the drawbacks of operating from so far south were well understood. To an extent, they had to be accepted, but the original basing plan was reversed, as we have seen, to position the larger GR4 detachment at Ali Al Salem.

The ROE and TD employed during Telic were only finalised the day before D-Day (although drafts were available earlier), and HQSTC's air lessons report subsequently described the production of the Directive as 'long and tortuous'. Nevertheless, Ministers and legal advisers were made aware of the realities of high-tempo, high-manoeuve warfare during its preparation, and thus agreed to accept that rigid control over targeting from London was unrealistic. The NCC received more extensive delegations than the CBF(A) had been granted during Operation Allied Force, four years before, and this proved particularly advantageous during the prosecution of time-sensitive targets. Delegations to contingent level were based on a CDE system that incorporated four tiers:

Tier 1. An assessment as to whether there are civilian objects within 500m of the aim-point. If none, the Casualty Estimate (CE) is 'Low', otherwise Tier 2 analysis is required.

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88. Lower serviceability was exacerbated by a lack of prepared base facilities at Al Udeid, including aircraft sunshades.

Tier 2. An assessment and analysis of those civilian objects to establish whether any are within the weapon Tier 2 radius, centred on the aim-point. No objects within the radius will result in a CE of 'Low' or 'Medium' (depending on the radius used), otherwise Tier 3 analysis is required.

Tier 3. An assessment using attack-specific data. This will result in a CE of 'Low', 'Medium' or 'High'.

Tier 4. An assessment involving full operational analysis tools. This will result in a CE of 'Low', 'Medium' or 'High'.

'Low' was defined as 0-30 civilian casualties, 'Medium' as 31-100 and 'High' as 100 or more. All air weapons were assigned Tier 2 Low and Tier 2 Medium distances. For example, for Paveway 2, the Tier 2 Low distance was 150 metres, while the Tier 2 Medium distance was 50 metres.

Individual target categories were delegated up to specified tier and civilian casualty levels. Thus, attacks against Iraqi military infrastructure were authorised by the NCC up to a civilian casualty estimate of Low using Tier 3 analysis. If the civilian casualty estimate was higher, the ACHQ would have to refer the target to the NCHQ, which might, in turn, have to refer it back to the UK. However, in practice, nearly all target approval decisions were taken in theatre.

US forces operated in accordance with somewhat different ROE and CDE procedures, and this inevitably injected some unwelcome friction into a process that often required rapid decision making. Nevertheless, the requirements of the UK TD were fully briefed to the responsible American staffs and it was very rare for RAF aircraft to be allocated targets that they were not allowed to attack. Moreover, through continuous discussion, it was often possible to identify and address potential problems well in advance. Then, if it was established that a target could not be assigned to UK aircraft or American aircraft flying from the UK or UK sovereign territory, it might be reassigned to an American aircraft flying from a non-UK base.

The UK red card was only produced on a handful of occasions – usually when there had been no opportunity for preliminary Anglo-US discussions. This happened on 29 March, and certain similar episodes occurred where the approval of time-sensitive targets was concerned. On another occasion, a target originally assigned to a US aircraft flying from a non-UK base was transferred to a UK-based B-52, but the ACHQ was not advised of the change until the last moment. The red card was used because there was no time to apply the proper clearance procedures.

## Tactical Air C2

The commitment of a detachment of three E-3Ds to any prospective operation against Iraq was considered almost from the outset of contingency planning in 2002. It was first proposed in a submission from CJO to DCDS(C) on 13 September, and HQSTC envisaged that the aircraft would be based at Incirlik, Turkey. However, their precise role in the operation was not defined in detail at this stage. It was not until December that RAF Waddington received notification to place all crews and personnel from the E-3D Squadrons on standby for a major deployment in support of the operation subsequently named Telic. As a detachment of E-3Ds based in Oman was still contributing to operations over Afghanistan, this new requirement imposed a considerable burden on the station. The detachment was withdrawn during the second half of December, but those involved began preparations for a return to the Gulf immediately.

On 17 January 2003, the station commander of RAF Waddington attended a briefing at HQSTC during which the C-in-C appraised both station commanders and group staffs of the latest planning for the operation. He confirmed that a detachment of E-3Ds would participate, although basing and other host-nation issues had still to be finalised. The US operation plan – OPLAN 1003V – required three separate E-3 orbits, each of which would perform AWACS and airborne command and control functions for the air campaign. The USAF did not have enough E-3s to meet the Iraq requirement and their other global commitments. Three RAF E-3Ds were therefore required to maintain one 24-hour orbit covering western Iraq, which represented one third of the overall AWACS/airborne C2 task. They would primarily focus on supporting the strategically vital Counter-TBM mission. This tasking left the aircrew assigned to the deployment with very little time to familiarise themselves with the Counter-TBM CONOPS, whereas some of the RAF and USAF units involved had already been preparing for the task for several months.

The initial E-3D deployment plan was issued on 23 January and envisaged a detachment of four aircraft and nine crews drawn from 8 and 23 Squadron (six from 8 Squadron, three from 23 Squadron), which might deploy for up to six months. All of those concerned were soon involved in strenuous work-up activity both in the air and via simulator and other ground training, practising the procedures that would be used in any future conflict with Iraq. Two crews also participated in an exercise entitled Desert Pivot at Kirtland Air Force Base, New Mexico. This was a combined simulator exercise incorporating a variety of aircraft, including AWACS, Compass Call, Rivet Joint, fighters and tankers.

Controlling the number of assets assigned to the western desert within time-sensitive or even time-critical parameters promised to impose a considerable workload on the E-3D weapons controllers. As we have noted, the E-3D was procured in the 1980s chiefly for air defence and could originally accommodate only two weapons controllers. In the Kosovo conflict, three had

barely been adequate. However, configuration changes after Allied Force meant that by 2003 it was possible to employ the E-3D with an enlarged four-man weapons control team and a fighter allocator. Although by no means standard, this was the arrangement chosen for Operation Telic.

Of course, this created a demand for more weapons controllers. To meet this and fill gaps in other crew positions in the planned E-3D detachment, 23 Sentry Conversion course flew training missions at every available opportunity. Another enhancement introduced into the E-3D fleet since Kosovo was the Joint Tactical Distribution System (JTIDS), also known as Link 16. Prior to Telic, under UOR procedures, an improved tracker was ordered with the capability to track contacts to the very high degree of accuracy that Link 16 platforms required.

Basing arrangements were finalised by the end of January: the E-3Ds were assigned to PSAB. A long-established RAF base and home to the Operation Resinate (South) Tornado F3 detachment, PSAB would also accommodate additional F3s, a Nimrod R1, Nimrod MR2s, VC10 tankers and numerous American aircraft committed to Telic. Deployment was to take place in the second half of February. However, other aspects of the E-3D plan were subject to revision. The basic task of the detachment involved manning a single orbit for 24 hours per day for an unspecified period, providing airborne warning and C2 for operations over the western desert while US E-3Cs performed equivalent functions on the central and eastern orbits. To achieve the western desert task, three E-3Ds would be employed for successive eight-hour periods on station. Originally, this commitment was expected to necessitate the deployment of five aircraft and nine operational crews (at the time representing all the operational E-3D aircrew at RAF Waddington) supported by two full shifts of first-line engineering staff.

Yet it soon became clear that the availability of accommodation and ramp space at PSAB would determine the overall force size and structure, and the constraints were such that the E-3D detachment had to be reduced to four aircraft and six operational crews. The detachment commander warned that the 24-hour orbit might prove difficult to sustain in such circumstances, as both crew fatigue and aircraft availability would be limiting factors, but the risks had ultimately to be accepted.

The E-3Ds' departure for PSAB was delayed by difficulties obtaining Egyptian and Saudi diplomatic clearance for over-flight and landing, but an advance party deployed on 24 February and immediately began setting up the necessary operations, mission briefing and flight support facilities. Two aircraft – together with two crews – followed on the 28th. The remaining two E-3Ds and two further crews flew to Saudi Arabia on 2 March, leaving the remaining personnel to deploy three days later.

The first two weeks on the base were challenging. Airlift constraints delayed the deployment of essential equipment, and some of the equipment that did reach theatre (mainly CIS) was temporarily impounded by the Saudi

authorities – apparently on procedural grounds. Early flying had to be undertaken without the benefit of the E-3D mission support system, which only became fully functional after 10 March. There was also a serious shortage of motor transport, a severe handicap given that PSAB was roughly the size of the Isle of Wight and that the coalition complex, where some of the detachment sleeping quarters were located, was a 30-minute drive from the main base operations area (known as ‘Ops Town’). The standard of accommodation at PSAB was better than expected, but domestic and office accommodation were overcrowded, some mission-critical personnel having to sleep four to a room. Temporary facilities, such as portacabins and tents, provided a partial solution, but these were not initially backed by much in the way of supporting infrastructure. Strenuous efforts were soon under way to remedy the various problems. There was much collaboration with other RAF detachments at PSAB to improve the standard of the facilities there, and the Americans provided invaluable assistance.

Ground preparation involved a wide range of briefs covering both the Counter-TBM CONOPS and Operation Resinate (South), including constant updates on the ATO and ACO. There were also regular ‘chair fly’ exercises in which the E-3D crews talked through a range of scenarios from the Counter-TBM CONOPS, which was issued as (in the American parlance) a ‘playbook’ to all participating personnel. The E-3Ds flew their first sorties on 4 March largely in support of Resinate (South). On 8 March, the detachment participated for the first time in a series of exercises entitled Blazing Saddles, practising the procedures that would be employed in Counter-TBM operations over western Iraq if war broke out. Orbiting in western Saudi Arabia, the E-3Ds were assigned responsibility for Iraqi airspace west of 43 degrees east and south of 35 degrees north. Their task was to undertake C2 of all air assets assigned to the Counter-TBM effort, including traditional and non-traditional ISR platforms, CAS assets for ground forces (chiefly SF), Defensive Counter-Air (DCA) and Offensive Counter-Air (OCA) assets. They were also to co-ordinate operations by air and ground forces and manage AAR of all air assets active over western Iraq.

The first exercise was not wholly successful from the E-3Ds’ perspective, partly because of satellite and other communications problems and partly because a shortage of DCA cover prevented them from orbiting in the correct area (priority in the allocation of DCA cover having been assigned to Operation Resinate (South)). DCA coverage improved once Resinate operations were placed on a 24-hour basis, and the detachment engineers quickly addressed the various communications issues. A communications trial sortie flown on 9 March ‘demonstrated that the majority of difficulties had been overcome’.

Although restricted aviation fuel supplies at PSAB imposed severe limits on the amount of flying that could be achieved in the second week of March, the E-3Ds contributed ten more sorties to Blazing Saddles prior to the start of operation Telic and apparently conducted ‘excellent Counter-Scud training’. There was also some further participation in Resinate (South), particularly from

the 15th to the 18th, when a considerable number of aircraft were being tasked into western Iraq for either ISR or Counter-TBM mission rehearsal. Boom AAR training featured during some of these sorties, but tanker capacity was severely stretched, and aircraft were not always available.

By 17 March, all deployed crews had flown at least one theatre familiarisation sortie and one Counter-TBM practice mission – enough in the detachment commander's view for them to be declared ready for forthcoming events. For the E-3Ds, Operation Telic really began on the morning of 18 March, when their 24-hour flying programme was initiated. In this way, they could establish a constant presence on the western orbit before introducing the Telic SPINS, ATO and ACO (at 0300Z on the 19th). The three eight-hour on-station periods were scheduled from 0800Z to 1600Z, 1600Z to 2400Z and from 0000Z to 0800Z. Including the transit time from PSAB, each E-3D sortie would be in the order of 12 hours in duration. The E-3D detachment executives formulated the sortie schedule to provide optimum coverage of western Iraq at times of day when the Iraqis had launched Scuds during the first Gulf War. During key threat periods, they were to be on station – not handing over or conducting AAR.

The ultimate switch to Operation Telic documentation proved extremely difficult, as numerous drafts were issued in the days preceding 19 March; the final SPINS only appeared on the 18th, while the ATO and ACO were not available until 2130Z that evening – for activation only five and a half hours later. As the RAF could not access the US SIPRNET CIS, planning and briefing data generated by the Americans had to be placed on disk and carried by hand from the CAOC to the E-3D operations section. As the detachment commander put it, 'The disconnect between an operation planned ... on US-only electronic CIS but executed by a UK C2 platform reliant on paper for its information, has been a recurring theme for the detachment.' After the Operation Telic ROE and TD came into force at 1800Z on 19 March, it transpired that there were small but significant differences in their application between US, UK and Australian forces, which had all to be assimilated by the E-3D crews.

Although the E-3Ds were partly employed for their early-warning capability, their primary role in coalition operations over western Iraq involved airborne C2 and was vitally important. At the highest level, C2 of Counter-TBM operations was vested in the CFACC and extended through the Combined Forces Special Operations Component Commander to the Commander Joint Special Operations Task Force-West (CJSOTF-W). Planning was conducted from a dedicated cell in the Time-Sensitive Targeting (TST) cell in the CAOC, while day-to-day responsibility for all airborne Counter-TBM operations and assets was vested in the Mission Commander at Azraq air base, Jordan. However, continuous C2 functions for airborne aircraft were exercised by the E-3Ds, which also maintained direct contact with the Command and Control Duty Officer in the TST cell. They were responsible for co-ordinating the activities of approximately 110 combat aircraft specifically assigned to the Counter-TBM

task, a wide range of ISR platforms and the fixed and rotary-wing air transport of the SF. The task was complicated further by the organic air support of other American SF teams, such as Task Force 20 (Delta Force), which were active in the western desert but not involved in Counter-TBM (see Annex C).

The system of AOs and JSOAs developed for western Iraq has already been described. Air support requests had normally to be submitted by SF units through CJSOTF-W's Joint Fires Element, and most were then passed to the Special Operations Liaison Element in the CAOC. But the E-3Ds were assigned a key role in this process. Air assets tasked in response to air support requests could only enter a JSOA under the control of the E-3Ds, which were tasked to 'push missions to the appropriate ground team'. Tactical level command and control was divided between operations inside and outside JSOAs, which were governed by different procedures, but, according to the CONOPS, 'the airborne C2 platform serves as the standardised communicator for the CFACC's intent in either case.'

With up to 30 SF teams due for insertion into western Iraq, there would clearly be a high probability of contact with the enemy. In turn, this could result in multiple and near-simultaneous calls for air support, which had the potential to overwhelm the on-task E-3D. The SF units were therefore directed to route all but the most urgent calls for CAS through their headquarters, 'most urgent' being defined as troops 'under imminent threat' (as opposed to troops in contact but not under such threat). Units confronted by an imminent threat were to contact the on-task E-3D directly, using the code-word 'sprint'. In priority, such calls were second only to those assigned the code-word 'earthquake' – the positive identification of a TBM in imminent launch profile.

Over the course of Operation Telic, the E-3Ds conducted a multiplicity of tasks. At the beginning of the operation (19-21 March) and in many other periods, they were responsible for controlling the airborne infiltration of SF; on 7 April, the first large aircraft to reach the renamed Baghdad International Airport – an SF C-130 – flew from H1 airfield under the airborne C2 of an E-3D. However, deconflicting the airspace of western Iraq was a particularly critical duty. Given the numerous air assets operating over the western desert simultaneously, the risk of mid-air collision was significantly greater than any threat posed by Iraqi air defences.

Deconfliction activity probably accounted for the largest proportion of E-3D tasking during Operation Telic. It was often of a routine nature, but there were periodically some more unusual and challenging scenarios. On more than one occasion, it was necessary to shepherd the Counter-TBM air assets out of the way of the numerous TLAMs and Conventional Air-Launched Cruise Missiles (CALCM) that were channelled across western Iraq during the first week of hostilities. The missiles sometimes strayed outside the agreed corridor, so the E-3Ds crews had to monitor their path carefully. From the flight deck, it was possible to watch some of them hit their targets and to see the glow of Baghdad,

over 200 nm away. Aircrew could also observe the missiles in flight on the radar. More common was the basic task of ensuring that ground units were not threatened by coalition air strikes, although E-3Ds had also to monitor potential ground-to-air threats. On a number of occasions, they co-ordinated unplanned firing by the US SF Highly Mobile Aerial Rocket System (HIMARS), the missiles from which could easily have threatened aircraft operating over western Iraq.

The E-3Ds were responsible for assigning offensive aircraft to a wide variety of targets. These included military vehicles, Iraqi aircraft, short-range SSMs, SAMs, radar sites, communications facilities, Ba'ath Party headquarters, bridges and bunkers. Some of these were pre-planned targets while others were targets of opportunity. On 7 April, the aircraft selected to bomb a Baghdad restaurant in a time-critical mission to kill Saddam Hussein was airborne over western Iraq when the tasking came through, and consequently received its orders from an RAF E-3D. Many more assets were assigned by the E-3Ds to investigate possible targets, including suspected TBMs, which were not attacked. In most cases, these would first have been spotted by other traditional or non-traditional ISR assets and either passed directly to the E-3Ds or passed via the Counter-TBM Mission Commander at Azraq. Sometimes, the on-station E-3D would 'pocket' targets that satisfied the extant ROE but were not necessarily a priority for attack. These could later be assigned to aircraft that would otherwise have been left untasked.

The E-3Ds repeatedly handled short-term CAS requests from SF teams, sometimes for offensive support, sometimes for striking identified fixed targets and sometimes because the SF found themselves under fire and called 'sprint'. In such circumstances, CAS assets were usually passed by the E-3Ds to SF FACs. The E-3Ds regularly tasked CAS to support the SAS and controlled all the air operations during the heavy fighting around the Haditha Dam at the end of March and in the first week of April. Between 9 and 11 April they co-ordinated what has been described elsewhere as 'the Al Qa'im International Air Show for the mayor and people of the town', i.e., the maintenance of a continuous large-scale air presence over Al Qa'im in support of ongoing surrender negotiations.

The E-3Ds were also extensively involved in the acquisition and relay of broader intelligence on Iraqi activities. They passed back information on Iraqi operations received from aircraft and the SF, reports of coalition troops in contact and intelligence on Iraqi GBAD, as well as managing the withdrawal or redirection of coalition air assets in response to specific threats. On 23 March, the on-task E-3D itself detected five potentially hostile air contacts near Assad airfield, which were flying at a speed of 450kts and heading south at an altitude of 3,000ft. All tankers, ISR and tactical aircraft operating over western Iraq were ordered to fly south, and the E-3D then worked with the central AWACS to send DCA assets from their combat air patrols to investigate. Ultimately, though, the

five contacts turned on to a new heading and faded, and it later transpired, once again, that they were US TLAMs.

Three days later, an E-3D identified three ground vehicles by radar and passed them on to a B-1B equipped with the Moving Target Indicator system. On 1 April, an E-3D detected and reported on the launch of an Iraqi short-range SSM. E-3Ds were also responsible for co-ordinating reconnaissance activity around roads leading from Iraq to Syria, which could potentially be used as escape routes by senior Iraqi regime figures. Similarly, they monitored the airspace in western Iraq, looking out for helicopters carrying escaping Iraqi leaders. Their surveillance work even extended into Syrian airspace, primarily to observe Syrian responses to coalition actions on the Iraqi side of the border. Syrian radar was extremely active throughout Telic, and there were strong suspicions that the Syrians were providing Iraq with an air picture of coalition operations over the western desert.

The E-3Ds were rarely directly threatened by Iraqi action. A few unguided SAMs were launched close to or even over the Saudi border, but only two were in any proximity to the aircraft. Both were reported as having the appearance of white firework trails with green tops. One (launched on 21 March) burned out well below the E-3D but the other, which was spotted on the night of the 29th/30th, actually reached the aircraft's normal operating altitude during Telic of 34,000ft. Consequently, the detachment commander reminded crews to vary their flying patterns and orbiting 'lobes' and change call signs so that their aircraft were more difficult to track.

Beyond controlling offensive air activity and ISR over western Iraq, the E-3Ds were also required to direct search and rescue operations for downed aircrew and SF who ran into difficulties. They co-ordinated the emergency extraction of M Squadron Special Boat Service (SBS) on 30 March and the search for two SBS personnel who remained at large afterwards. They also handled casualty evacuation for American SF on the Haditha Dam on 2 and 3 April and assisted the centre AWACS in a CSAR operation on the 1st.

Another regular task was the organisation of short-term changes to AAR plans; the critical link between the combat and ISR aircraft and the fuel they needed to remain airborne was the E-3D. On 25 March, such changes were occasioned by a combination of factors, including the limited number of tankers available and poor weather, which prevented some aircraft from landing at their normal bases. On 6 April, an E-3D handled an emergency AAR link-up, when the planned rendezvous was prevented by the weather, and aircraft that could not complete their planned AAR for various reasons were diverted to the nearest available coalition air bases on several occasions. On 9 April, a number of aircraft – mainly A-10s – arrived in western Iraqi airspace with no tankers assigned to them at all, requiring some unscheduled AAR arrangements to be improvised at particularly short notice.

The following single report from the third E-3D mission on 2 April gives some flavour of the scope and tempo of the detachment's work during Operation Telic. Of the various call-signs, Bondo was the E-3D, Bloodhound was the Counter-TBM Mission Commander at Azraq, Striker was the TF20 GFAC, and Curfew, Groovy, Nodder, Cobweb, Facing, Ewok, Stew and Look were all aircraft under the E-3D's control.

After the crew proceeded on station at 0200Z, the activity soon built. At 0228Z, Curfew 15 was tasked to investigate a squall (a possible Scud TEL) and identified the contact as a fuel tanker. The tasking at Haditha Dam remained heavy as it had been for the last couple of sorties, and at 0230Z Groovy 11 was tasked to work with Striker 72, a GFAC with Task Force 20. A further squall was reported at 0350Z and was investigated by Nodder 11, who confirmed that it was not an SSM. Curfew was again tasked with a visual identification task at 0500Z ... Initially the contact was identified as military vehicles and troops, however on closer investigation they were found to be farm vehicles and sheep! Cobweb 25 continued the activity when, at 0507Z, he reported that hide site 07004 was full of munitions. This target was pocketed and passed to the Special Forces. Shortly after, at 0520Z, Nodder 11 identified several trucks, tracked artillery and a Roland [SAM]. During this process he picked up indications of being tracked by SA-8. These targets were again pocketed. Activity at Haditha Dam continued and at 0539 Striker 73/32/35 required continuous coverage. Facing 15, Curfew 15, Nodder 11 and Ewok 17 were allocated in turn and struck several targets including tanks, troops, artillery and boats in the vicinity. At 0725Z Bloodhound passed tasking to investigate 3 DMPIs believed to be vehicles in culverts, [and] these were confirmed clear by Stew 33. Cobweb 25 was pushed up to support the activity around the dam and gained a successful strike on some artillery ... though he did express concern over congestion over the target area. This was unsurprising considering the number of aircraft in the vicinity. At 0825Z Bloodhound passed further tasking to target an SA-3 site, [and] the target was designated by a Predator. Towards Haditha Dam the fighting became more intense and at 0840Z Look 13 relayed that the teams were taking direct fire and required casevac. Striker's satcom was also down. At 0846Z all assets available at the dam were put into a co-ordinated flow plan to support the troops who were by then taking mortar and artillery fire. The activity at Haditha dam continued until Bodo called off station at 1000Z.

In most respects, the entire Counter-TBM CONOPS ran very smoothly from the E-3D detachment's perspective. Although the first operational sorties witnessed a recurrence of the satellite communications failures encountered during some of the Blazing Saddles exercises, these were quickly traced to a so-called 'black hole' in satellite coverage that could be avoided simply by orbiting in an alternative lobe. Similarly, when operations in the western desert shifted predominantly to the north in early April, causing some deterioration in E-3D UHF communications with the SF, a solution was swiftly produced by moving the E-3D orbit north into a Restricted Operating Zone (ROZ) in Iraqi airspace (with the UKACC's agreement). The area employed was deconflicted from other air traffic and was not subject to any very significant threat from Iraqi GBAD. At first, the new orbit could only be used on a case-by-case basis, but the UKACC later agreed to allow crews to employ it whenever it was deemed operationally necessary.

The delayed appearance of essential paperwork – the latest ATOs, ACOs and amendments to SPINS or the Counter-TBM CONOPS – remained a problem. For much of Operation Telic, these documents were only finalised on the evening prior to the day of their introduction (at 0300Z), making mission planning very difficult for the third E-3D, which was responsible for the 0000Z to 0800Z on-station period. Yet there was no obvious solution, given that the E-3D mission extended over 24 hours, and the records do not identify any notable adverse consequences apart from the extra workload imposed on the crews.

The majority of contributors to the Counter-TBM mission adhered rigidly to the published CONOPS, and there were few significant digressions. On two recorded occasions, the Mission Commander at Azraq issued 'destroy' instructions prematurely. According to the CONOPS, such instructions could only be issued after deconfliction with ground forces had been completed. However, on 23 March, the Mission Commander ordered the destruction of a bridge before ground units had fully withdrawn. Luckily, there were no friendly casualties. When a similar order was issued on 28 March, the on-station E-3D treated it with greater caution and intervened to ensure the necessary deconfliction.

Occasionally, coalition aircraft failed to 'squawk' the appropriate IFF modes. These included a C-130 on 3 April and an aircraft involved in casualty evacuation on the 8th; both were quickly identified as friendly. A more serious contravention of the SPINS took place on the 10th, when the second E-3D mission recorded that 'many' SF aircraft transited their Area of Responsibility (AOR) without squawking. Periodically, too, aircraft failed to 'check in' with on-station E-3Ds before entering western Iraqi airspace, despite being specifically required to do so by the Counter-TBM CONOPS. These included B-52s and F-15s on 9 April, which were 'not talking to anyone but simply executing a pre-planned DMPI list'. While these attacks had apparently been deconflicted with ground operations, no equivalent process had taken place in the air. On the 10th,

the first E-3D picked up an unidentified aircraft transiting from Ar'ar air base to H-1; it passed close to two other coalition aircraft but failed to make contact with the E-3D and did not respond to any calls. Two days later, 'a number of fast air players came well inside the western AOR without checking in,' including two aircraft described as 'Tornados', a Harrier GR7, and two more unidentified contacts.

The other intermittent problem involving coalition aircraft was IFF jamming, which was repeatedly experienced during the second week of April. This is said to have degraded the E-3D sensor considerably, making an accurate recognised air picture difficult to produce and compromising flight safety. With the help of the centre AWACS and a Nimrod R1, the culprit was identified as a US EA6B Prowler; the jamming apparently ceased on 10 April.

Perhaps the greatest challenge confronting the E-3D detachment during Operation Telic, given the limited number of aircrew and aircraft deployed, was that of sustaining the continuous 24-hour operations required to execute the Counter-TBM mission. As early as the first week of hostilities, it became necessary to consider the deployment of three additional crews at the beginning of April. By that time, all the crews in theatre would have flown at least 80 hours in 15 days; between 5 and 7 April, they would reach 130 hours in 30 days. This exceeded maximum operational flying hours as stipulated on safety grounds by HQ 2 Group. However, after much discussion, the UKACC decided that the additional personnel would not become essential until the 9th. As he anticipated a reduction in tasking in the interim and was under orders to ensure that the various UK force elements remained as 'lean' as possible, the E-3D crews were instructed to prepare themselves for the long haul.

The detachment commander recorded on 1 April that they were doing well and were firmly established in their various sleeping patterns. They were nevertheless closely monitored for signs of fatigue before each mission. He was confident that they could maintain 24-hour operations for at least another week but considered that two weeks 'might be stretching things'. On 4 April, the UKACC visited the detachment and agreed contingency measures for the deployment of additional weapons controllers in the event of continued 24/7 operations, but a decline in the flying rate appeared far more likely.

No easier than the task of maintaining continuous 24-hour flying with six E-3D crews was the challenge of doing so with only four aircraft. Three aircraft per day were required for the Counter-TBM missions and a spare had to be available for each launch. The planned flying rate was far above normal peacetime levels and was more intensive than any rate formerly maintained by an E-3D detachment on operations. To sustain it, the detachment engineers established two twelve-hour shifts, which they each worked for six days per week. After one aircraft (ZH107) suffered a number of unserviceabilities, it became the primary source of parts for the other three, pending the arrival of spares from the UK.

As time passed, the task of providing three serviceable aircraft per day became increasingly taxing. By the second week of April, the engineers were working in temperatures of up to 50 degrees C, delays in the delivery of spare parts were giving cause for concern, and items of equipment were regularly being swapped from one aircraft to another to compensate. One of the deployed E-3Ds (ZH103) was rapidly approaching a point at which scheduled servicing would become essential, and further difficulties were being experienced with ZH107. Flying had to be concentrated on ZH104 and 105 as far as possible. On many occasions, the incoming E-3D had to be turned around in as little as four hours to ensure that a spare aircraft was available for the next mission.

It appears unlikely that the E-3D detachment could have sustained 24/7 operations for very much longer without the deployment of additional personnel and aircraft. In the event, however, the collapse of Iraqi resistance rendered this unnecessary. On 11 April, the second E-3D found that airborne C2 was only really required around the Tikrit area, which lay beyond their AOR, and the on-board tactical director commented that there was not nearly enough work for the three coalition AWACS. By the 14th, there was no longer any significant activity in the airspace over western Iraq beyond limited air traffic management, and the CAOC planners therefore agreed to a draw-down of AWACS coverage. The E-3D detachment mounted two more sorties on the 15th, the 16th was a 'down' day, and they flew only a single eight-hour mission per day over southern Iraq thereafter, the other 16 hours being covered by US E-3Cs. During the second half of the month, the detachment was reduced to two aircraft and three crews. They were finally withdrawn from PSAB on 1 June, by which time three ground Control and Reporting Centres had been established in Iraq. During the period 19 March to 15 April (inclusive), the E-3D detachment flew 74 operational sorties for nearly 900 hours.

An objective assessment of E-3D operations during Telic could only reach very positive conclusions. In 1999, Operation Allied Force had been followed by several recommendations for enhancing the E-3Ds, but no similar proposals appear to have followed Telic; the lessons of Kosovo had been applied. The key issues that emerge from this narrative are as follows:

**Host-Nation Support.** When the Turkish basing plan collapsed, the UK was luckily able to exploit pre-existing Operation Resinate (South) basing arrangements at such locations as PSAB as alternatives. Yet with large numbers of UK and US aircraft all requiring ramp space, PSAB's resources were severely stretched. The planned E-3D detachment had therefore to be reduced in scale, which in turn placed limits on its sustainability. Fortunately, these limits were not reached before hostilities came to an end.

**Force Generation.** The generation of a force capable of fulfilling the Counter-TBM mission was an exceptional achievement given the E-3Ds' prior commitment to Operation Oracle and the limited time available for crews to prepare for the unusual and highly specialised tasking they would execute over western Iraq. The problems experienced with communications early in the deployment almost certainly resulted from the haste with which the aircraft were prepared, but they were soon rectified.

**Flexibility.** The E-3Ds made a highly significant contribution to an extensive range of air operations. These included SF infiltration and extraction, CAS, non-traditional ISR, information relay, AAR, CSAR, AEW and the organisation of large-scale air presence.

**Interoperability.** The E-3Ds demonstrated throughout the operation their capacity to conduct airborne C2 in airspace dominated by the USAF. Crucial to their success was JTIDS; indeed, the E-3D's role in Telic would probably have been impossible without JTIDS, given that the system was employed by much of the USAF. The detachment's key interoperability problem was its inability to access American CIS, which severely hampered mission planning activity from one day to the next.

**Joint Capability.** The E-3Ds played a vital role in co-ordinating the activities of air and ground forces in western Iraq, demonstrating in the process that effective airborne C2 is a fundamental prerequisite for air operations in support of the SF.

## **Conclusion**

In many respects, air C2 ran far more smoothly in Operation Telic than in the Kosovo conflict. Some familiar difficulties arose. Again, after-action reports remarked on the weakness of the RAF's communications and CIS infrastructure, and on the CAOC's shortcomings where intelligence exploitation and BDA were concerned. Nevertheless, the majority of assessments were broadly positive. C2 arrangements benefited from the fact that there was more lead time for planning and preparation – especially where Counter-TBM operations were concerned. Far fewer countries participated in the coalition and it was dominated by the US and the UK, which had for long been operating together in the Gulf. When problems arose, they could often be dealt with informally and bilaterally. The laborious multinational NATO processes that caused so many difficulties in 1999 were notably absent. There was also less political interference and considerably more delegation to commanders in theatre.

Although human resources were certainly stretched, the RAF manned the UK ACHQ with trained JFACHQ personnel, augmentees and other staff who had gained C2 experience from operations over the Gulf and the former Yugoslavia since 1990. RAF officers also filled influential embedded positions in the CAOC, and RAF E-3Ds assumed responsibility for the demanding western airborne C2 orbit 24 hours per day.

During the operation, the USAF demonstrated a number of impressive advances in the field of TST, and this prompted recommendations for the RAF to review TST procedures and potentially develop computer modelling techniques to support CDE and increase the scope for delegating targeting authority, so accelerating the approval process.

Yet while some past problems were successfully addressed, the coalition was confronted by several new air C2 challenges. The transition from Resinate to Telic was one of these, but the most notable was the move away from deliberate or pre-planned operations towards dynamic tasking, chiefly in the form of KI/CAS. This involved the delegation of some C2 functions to the V Corps ASOC and 1 MEF DASC. The many and varied difficulties involved were reflected in the fact that numerous combat aircraft were left untasked by these agencies – something that led to the development of secondary targeting of a more deliberate character. Furthermore, the coalition air forces were no longer cast in the lead role they had played in Granby, Deliberate Force and Allied Force. Instead, they found themselves supporting a ground plan in which the direct effect of air power was considerably less important than the volume of support provided to the Land Component. In this context, it was easy for both air and land to underestimate the importance of truly integrated planning based on the achievement of operational effect.

## OPERATION HERRICK: AFGHANISTAN 2004-14<sup>89</sup>

Operation Herrick was the name assigned to all British military operations in Afghanistan between 2004 and 2014. It is primarily associated with the period initiated by Operation Herrick IV in the spring of 2006, when the UK sought to lead the expansion of the International Security and Assistance Force (ISAF) into Southern Afghanistan and defeat the Taliban insurgency in the region. This was the beginning of the UK's extended military commitment in Helmand Province and the watershed between the early, limited missions of the 2001-2005 period and the continuous expansion of British forces in Afghanistan from 2006 to 2011.

Herrick was manifestly not the operation anticipated by the British government, the MOD and PJHQ. Indeed, it was far larger and far more difficult, protracted and costly than predicted. The Taliban and other Afghan insurgent elements proved themselves highly competent, determined and resilient adversaries. Consequently, when British and other ISAF forces ultimately withdrew, they left behind a situation still characterised by great uncertainty, instability and insecurity. The current trend is not to view Operation Herrick in terms of victory or defeat, but it would certainly be difficult to argue that it ended in outright victory.

The RAF's contribution to Herrick varied considerably over time. Between 2004 and 2006, the only continuous RAF presence in Afghanistan was maintained by a detachment of six Harrier GR7s and a single C130 at Kandahar, although there were periodic contributions from ISR platforms such as Canberra PR9s and Nimrod MR2s. However, by July 2007, around 30 RAF aircraft were involved, flying from bases in both Afghanistan and the Arabian Peninsula. Fixed-wing aircraft came under the command of the UKACC, who also served as the AOC 83 Expeditionary Air Group (EAG), based at Al Udeid, Qatar. UKACCs were rotated every six months at first. Later, the post was extended in duration to nine months and then, from 2011, a full year (see Annex D).

Under 83 EAG, the RAF force elements in theatre formed Expeditionary Air Wings (EAWs), principally 904 EAW at Kandahar and 902 EAW at Seeb in Oman. In due course, 903 EAW was also established at Bastion Airfield in Helmand. As time passed, the aircraft deployed during the early years of the operation made way for other types. Although the C130 presence endured, and the RAF maintained AAR tankers in theatre, the Harriers made way for Tornado GR4s, and the Nimrods were replaced by Reaper UAVs, Sentinels and Shadow R1s – the UK's contribution to one of the largest airborne ISR fleets in history. Not all RAF assets in Afghanistan were incorporated into 83 EAG. Rotary wing

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89. Unless otherwise stated, this chapter is based on the unpublished AHB narratives *The Royal Air Force in Operation Herrick: ISTAR* and *The Royal Air Force in Operation Herrick: Combat Air Power*.

aircraft such as Chinooks initially formed part of the Joint Helicopter Force (Afghanistan), which was subsequently replaced by the Joint Aviation Group.

The flying effort expended during the operation was inevitably very high. The fast jet detachments alone accumulated a total of nearly 18,500 sorties for approximately 56,000 hours between 2004 and 2014. Air power played a critically important part in the coalition campaign, providing mobility, firepower, surveillance and resupply capabilities at short notice in support of ground operations and to sustain coalition troops across Afghanistan. It served as a vital enabler, and its presence or absence was often enough to determine whether ground operations were launched. Equally, air power fulfilled its historical role in COIN by functioning as a force multiplier on a grand scale. Nevertheless, the combined efforts of the coalition air forces and the Land Component were not enough to suppress the insurgency. The most that could be achieved was a transfer of authority to the Afghan National Security Forces (ANSF) pending the termination of ISAF's mission.

### **Air C2 Structures**

In the utilisation of air power, effective C2 is no less important in counterinsurgency than in conventional warfare. In COIN, where multiple small-scale ground operations tend to be mounted concurrently, air C2 may generate particularly acute challenges. If air C2 structures provide assured and timely air support, the rewards are likely to be considerable; if they fail to do so, the consequences may be detrimental in the extreme. To judge from Operation Herrick, it may prove particularly difficult to devise rational and efficient air C2 arrangements for COIN in complex joint and coalition environments characterised by pronounced differences of perspective and prioritisation among participating nations and components.

Some of the problems were historically familiar, but others were more specific to the Afghan war. First, in Afghanistan, two distinct operations effectively ran side by side in the form of the US Operation Enduring Freedom (OEF) and the NATO ISAF mission, and other US operations were in progress across the region as a whole, notably in Iraq. This prevented the establishment of command structures similar to those employed during the two Gulf Wars based on coalition components and national contingents. The ISAF operation was commanded by NATO's Joint Force Command, based at Brunssum in the Netherlands; in Kabul, the Commander ISAF was effectively the Joint Task Force Commander, but there was no subordinate air component. Instead, theatre air assets came under the entirely separate US CENTCOM command chain. The UK did not deploy an NCHQ during Operation Herrick, and an NCC was not appointed until 2009. Until then, the senior British officer in Afghanistan was the Commander of Task Force Helmand even though the Commander Task Force title was normally reserved for UK rather than coalition operations.

The UKACC not only commanded RAF forces committed to Herrick but also those deployed on Operation Telic, which continued until 2009. Both he and the Commander Task Force Helmand worked directly (and separately) back to PJHQ, and the UKACC continued to do so after the appointment of the first NCC. Neither the UKACC nor the forces at his disposal were formally subordinated to the NCC.

Second, while many different nations contributed ground forces to ISAF, the overwhelming preponderance of air power came from a single source – the US – and the Americans had long-established air C2 facilities based in the Gulf. Third, especially on ISAF's part, there was a pronounced, misguided and very unfortunate tendency to underestimate how important air power would be in Afghanistan – particularly when the time came to expand into the turbulent south. For all these reasons, air C2 generated significant difficulties during Operation Herrick, which endured for the better part of six years and throughout the period when the coalition's declared aspiration was to defeat the Afghan insurgency.

When OEF was launched in response to Al Qaeda's attacks on the World Trade Centre and other targets in the United States in 2001, it drew heavily on US forces and capabilities already deployed in the Persian Gulf. The Air Component Commander directed operations from CENTCOM's new CAOC at PSAB, Saudi Arabia. As the UK was the US's main coalition partner in theatre, there were several embedded RAF posts in the CAOC, which was also the location from which the UKACC exercised his command. Although the US presence in the Gulf was substantially configured to support conventional state-on-state operations, there was enough flexibility to meet the initial requirements of OEF too. C2 structures and processes designed for the containment of Iraq since 1991 absorbed this additional commitment with no great difficulty. Equally, because of the UK's involvement in operations over Iraq and the accompanying investment in integrated US-UK air power capabilities, the various RAF platforms could be accommodated quite easily within the broader US-led coalition. Indeed, the UK was better placed than any other country to fight alongside the Americans.

These air C2 arrangements were sufficiently robust to handle the initial Afghanistan intervention, which soon secured the air environment, but difficulties were encountered after the start of combined operations with SF and Northern Alliance forces on the ground. At this point, the CAOC found itself confronted by a sharp increase in tempo, and the rapid series of Northern Alliance advances soon outstripped its capacity to interpret when and where air support should be brought to bear. Its problems in this regard were compounded by the persistent efforts of CENTCOM Headquarters (in Tampa, Florida) to micromanage the campaign. We might judge with hindsight that this was a warning call, but the CAOC adapted to the more immediate challenges, and its success was apparently confirmed by the very fact of the Taliban's overthrow.

ISAF, in its early stages, did not have much need for air support, so there seemed to be no obvious requirement for discrete air C2 provisions in Afghanistan. By contrast, far greater demands were generated by continuing operations under the OEF banner. Yet the focus of US strategy was at this time shifting towards Iraq, so air resources had to be carefully managed to sustain the requirements of both theatres. In these circumstances, there was a clear and overwhelming case for keeping full air C2 authority for Afghanistan at the PSAB CAOC, from where missions over the Iraqi No-Fly Zones were also controlled. This situation was not unprecedented. Indeed, it brings to mind the RAF's position in the Far East at the time of Malayan Emergency of the 1950s, when the requirement to support the security forces in Malaya had to be reconciled with broader air defence commitments exercised by a headquarters in Singapore. The confused air C2 arrangements that evolved as a result took several years to rationalise.<sup>90</sup> If anything, the task in Afghanistan would prove even more difficult.

When ISAF assumed command of the Afghanistan peace-keeping mission from the US-led coalition in late 2003, the CAOC (by this time located at Al Udeid, Qatar) had again only recently demonstrated its utility in large-scale conventional warfare – Operation Iraqi Freedom. Hence, so long as the means existed for ISAF to be provided with air support as and when required, there was still no clear case for introducing significant changes in air C2. The process that was applied involved ISAF and OEF requests for air power being pooled at a US ASOC at Bagram air base, Afghanistan, which came under the CFACC's Air Coordination Element (ACE). There, they were prioritised and passed on to the CAOC. Thus, from the outset, a dual system of air C2 developed in which there was no higher-level integration; this arrangement mirrored the broader duality of the ISAF (NATO) and Enduring Freedom (US-led coalition) C2 construct.

At the time, perhaps, this was not especially important given ISAF's limited requirement for air power. However, there is a case for arguing that the expansion of ISAF from 2005 should have been accompanied by robust measures to unify the air C2 chain and establish a clear and distinct line of authority extending from Commander ISAF (COMISAF) down to the lowest tactical levels. Instead, the system of dual command was enshrined within the new structures that came into existence, creating a mould that proved impossible to break decisively until the end of 2011.

In 2005, NATO tabled new air C2 proposals to support ISAF expansion. These involved the establishment of a Tactical Air Operations Centre (TAOC) at the Joint Operations Centre (JOC) at HQ ISAF in Kabul to coordinate tasking and requests for ISAF air assets, which would then be passed directly to the CAOC. Coming under a 2-Star ISAF Deputy Commander (DCOM) Air, the air organisation within the JOC would be quite separate from and independent of the

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90. Air Historical Branch, *The RAF, Small Wars and Insurgencies: Later Colonial Operations*, pp. 22-23.

CFACC machinery at Bagram, even though the Americans – very largely the USAF – provided the vast majority of the air assets employed over Afghanistan. The US 2-Star Deputy CFACC (DCFACC) at the CAOC would also function as the subordinate of ISAF's DCOM Air.

This concept was not well received by the US, nor was it welcomed at senior levels of the RAF, because it seemed likely that the CAOC would receive unprioritised and competing bids from Kabul and Bagram and be expected to decide between them. There was also reason to doubt that ISAF would have the resources necessary to run an effective TAOC in Kabul until the end of 2006. A better approach suggested itself in the form of a combined US/ISAF air operations cell at Bagram, which would remove the more immediate coordination and resourcing problems and allow ISAF capabilities to be developed gradually pending an ultimate relocation to Kabul. The appointment of an RAF officer to the ISAF DCOM Air post would also help to build bridges between the US and other NATO members.

After receiving these recommendations, SACEUR forwarded them to the Commander-in-Chief Joint Forces Command, Brunssum. Yet the C-in-C was determined to position the TAOC at Kabul and exercise his own authority and judgement in the selection of a suitable DCOM Air. In March 2006, after extended deliberations, the Americans signalled their acceptance of NATO's proposals, the only further development being a plan to establish an ISAF cell under 1-Star command at the CAOC. This post *was* allocated to the RAF.

Events would fully substantiate the validity of Anglo-US concerns within a matter of months. Writing in October 2006, one RAF observer described 'the schizophrenic existence of the DCFACC and the lack of a clear tasking line for assets into the ISAF theatre. HQ ISAF has to secure air support on a "grace and favour" basis and does not have the requisite linkages or capabilities in place to optimise the delivery of air.' A former DCFACC remarked of the TAOC,

It had a small staff and some ability to communicate with aircraft but lacked the ability to develop strategy, provide a master attack plan, perform the ATO production and dissemination, and so on. It did not have an adequate combat operations center with a capability of real-time monitoring and directing aircraft, orchestrating the ISR platforms, generating intelligence and requirements – the whole package of modern air operations ... NATO had simply not made the investment in deployable C2 capability.<sup>91</sup>

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91. Dag Henriksen (ed), *Air Power in Afghanistan, 2005-10: The Air Commanders' Perspectives* (Air University Press, Maxwell, 2014), p. 33.

Relations between ISAF's DCOM Air and the DCFACC became severely strained. At the end of the year, the CFACC decided to move the ACE from Bagram to the ISAF JOC in Kabul. In due course, it would become known as the Air Component Coordination Element (ACCE). The aim was 'to augment ISAF's air staff and provide the much-needed expertise and knowledge for planning, coordinating and employing the full spectrum of US airpower capabilities in complex joint operations'.<sup>92</sup>

The RAF 1-Star post in the CAOC was also transferred to HQ ISAF. Rather confusingly, the post-holder became known as the Director Air Coordination Element. Although he was formally positioned under the DCOM Air, the appointment of a senior RAF officer with extensive C2 experience as Director ACE reflected aspirations to the effect that he might represent the CAOC's outlook and inclination within the ISAF command chain. Yet this proved impossible due to the prevailing tension between Kabul and Al Udeid. In the end, it was necessary to accept that the Director ACE could not serve two masters and was primarily responsible to the DCOM Air.<sup>93</sup>

2007 witnessed significant advances in the delivery of air power in Afghanistan but any improvements in higher air C2 were more modest. In July (while operations in Iraq were still on-going), the UKACC noted:

Whereas the CAOC's role is enshrined in the airman's doctrine of "centralised command, decentralised execution", I believe that ... this doctrine, formulated to conduct a single Air Campaign against a Cold War foe, may be out-dated and inappropriate in a COIN campaign. Whilst the CFACC and CAOC can usefully apportion "pre-planned" air strategically across two campaigns, the CFACC could afford to relax his grip on the application of "reactive" air (CAS) ... While this is considered heresy by some of the air power purists, there would definitely be advantages in ALI at the tactical level and some of the inflexibility created by the Air Tasking Order would be reduced.

On the other hand, the majority of senior CAOC staff retained their doctrinal faith in centralised air command as well as the conviction that ISAF lacked the means to exercise air C2 effectively. The key element of confidence was decidedly lacking and, until it was established, significant delegation from Al Udeid was never likely. In an attempt to secure more influence and better collaboration between the CAOC and HQ ISAF, the CFACC raised the Director ACCE position to 2-Star level, but this development proved unwelcome in Kabul and apparently made little difference. As the DCOM Air put it,

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92. Henriksen, *Air Power in Afghanistan*, p. 50.

93. Henriksen, *Air Power in Afghanistan*, p. 87.

The US Air Force ACCE came without any introduction or explanation. This created a lot of questions and even irritation within ISAF HQ. What was his role? Who was he representing? What were his tasks, roles, and authorities? Other than COMISAF himself, the attitude of the staff became one of complete neglect. To be honest, it was quite embarrassing. Even during morning commanders' briefings, the major general was not offered a chair and therefore had to remain standing while others were seated. NATO's approach was that the US ACCE was not needed and was a duplication of the position of DCOM-Air.<sup>94</sup>

After the departure of the first RAF 1-Star from the Director ACE post, a reorganisation led to ISAF's three DCOM positions being cut to one, and the 2-Star DCOM Air was renamed Director ACE; under him, the RAF retained a 1-Star post – the Deputy Director ACE Operations. The ACE prioritised and apportioned air resources to NATO task forces and SF operations based on requests submitted by embedded air planners at regional, task force and battle group headquarters. It then sent its direction and guidance back to the CAOC, where the ATOs and ACOs were prepared and disseminated to air bases and detachments in and around the Afghanistan theatre and to aircraft carriers in the Arabian Sea.<sup>95</sup> The ACE also maintained a coordination cell in the CAOC. Its presence and direct link back to the Deputy Director ACE Operations in Kabul provided a channel that helped to improve understanding and collaboration between the two headquarters to a limited degree. The Deputy Director also ran ISAF's TAOC, beneath which were five Regional Air Operations Centres (RAOCs), and air planning teams at the five Regional Command headquarters.<sup>96</sup>

ISAF's air C2 structures subsequently developed in a manner that duplicated the functions of the CAOC but did not replace them, and the CAOC retained what might be termed air C2 primacy. In August 2009, after command of OEF and ISAF forces was combined under General Stanley McChrystal, ISAF's command structure was extensively reorganised. HQ ISAF was divided into two, with the higher headquarters given the task of strategic over-watch. Responsibility for operations was assigned to a new ISAF Joint Command (IJC).

This could perhaps have provided an opportunity to address the air C2 problem, but it remained as insoluble as ever. Duality reasserted itself, the IJC Deputy Chief of Staff (DCOS) Air post being established as the senior air officer under the Commander IJC and allocated to Germany; beneath him, an RAF Air Commodore continued to occupy the Air Operations post. There was no starred

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94. Henriksen, *Air Power in Afghanistan*, p. 89.

95. Henriksen, *Air Power in Afghanistan*, p. 164.

96. Henriksen, *Air Power in Afghanistan*, p. 165.

USAF officer within the IJC. Instead, the CFACC retained his separate 2-Star representative – the Director ACCE. Writing in February 2010, the UKACC referred to an air C2 construct that was both convoluted and confused:

The result ... provides a 'control link' but no clear command chain ... Ideally, we would have a clear command chain linking COMISAF to the cockpit, which would include the USAF and involve the CAOC. COMISAF and COMIJC need a senior air adviser with the credibility, experience, access and understanding that a USAF flag officer would provide ... The senior airman would importantly also act as the in-theatre Air Commander. This is not to create an air component but to recognise the distinctive nature of the air and ground environments; the creation of a 'COM Air' post would enable a single command and control thread to run from COM ISAF through COM IJC and COM Air to the various Air Wings.

However, one important change did take place in that the new CFACC, Lieutenant General Mike Hostage, delegated to the ACCE, as Commander 9 Air and Space Expeditionary Task Force (9 AETF), limited OPCON and full administrative control over AFCENT forces in Afghanistan:

Although the tactical control of theatre-wide air assets remains at the AFCENT CAOC, the ACCE has authority to organise forces, recommend courses of action, and provide authoritative direction to the subordinate air expeditionary wings. The ACCE also ensures that inputs to their air tasking order meet the needs of the operation or plan.<sup>97</sup>

As a result, the ACCE

Received sufficient resources to place liaison officers across adjacent headquarters structures in Kabul. This additional manpower ensured an airman's presence in planning cells at Headquarters International Security Assistance Force, Headquarters ISAF Joint Command, and Headquarters United States Forces – Afghanistan. Simply stated, these airmen 'connected the wires' for cross-domain activities.<sup>98</sup>

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97. Lieutenant General Mike Hostage, 'A Seat at the Table: Beyond the Air Component Coordination Element', *Air and Space Power Journal*, Winter 2010, pp. 18-20.

98. Major General Charles W. Lyon and Lieutenant Colonel Andrew B. Stone, 'Right-Sizing Airpower Command and Control for the Afghanistan Counterinsurgency', *Air and Space Power Journal*, Summer 2011, p. 5.

These developments were undoubtedly significant. Nevertheless, it will be noted that the ACCE's activities remained entirely separate from those of the IJC DCOS Air. It may be, however, that the new arrangements helped to highlight the flaws in the system of dual air C2, so underlining the case for the merger of the two posts. In December 2011, the Germans unexpectedly announced their intention to relinquish the DCOS Air position, after which it was agreed between the Chief of Staff, USAF, and SACEUR that the ACCE should also fulfil this role; a number of subordinate American and NATO A3 and A5 posts were then similarly combined. With some understatement, this was described by the RAF Air Commodore at IJC as 'a significant step forward for air C2 in Afghanistan'.

A formal relationship now exists between the CFACC and IJC rather than the coordination link that existed previously, and this has driven out much of the dual-staffing and overlaps my predecessors endured.

### **Air C2 Problems and Solutions**

What were the consequences of the long-term failure to secure unified and integrated air C2 in Afghanistan? First, it seriously impeded the scope for effective ALI. It is generally accepted that in COIN, more than in other types of warfare, effective integration of air and land forces is required at the lowest practicable command levels. Unfortunately, in Afghanistan, there was insufficient lower-level integration because of the enduring and rigid institutional divide between the CAOC, with its responsibility for air, and ISAF, which controlled land forces. Second, partly as a consequence, there was no comprehensive shared understanding of air power's role and purpose in the expanding ISAF operation. This would have been difficult to achieve under any circumstances as ISAF did not really engage in operational planning; rather it functioned as a co-ordinating agency between the different Regional Commands and the provincial task forces.

In the absence of such an understanding, air power was employed for routine enabling and logistical functions, assigned on an *ad hoc* basis in response to so-called Joint Tactical Air Support Requests (JTARs) originating at the lowest tactical levels, or tasked reactively. Throughout Herrick, overriding priority in the allocation of air support was assigned to so-called Troops-in-Contact (TIC) incidents, when ground units were unexpectedly engaged by enemy forces. All too frequently, air was excluded from ISAF planning processes until they were well advanced. The result was that the air dimension was not exploited nearly as effectively as it might have been. Too much of ISAF's asymmetrical advantage – air power – was expended on supporting a symmetrical strategy of playing the insurgent at his own game, on his turf and by his rules.

Even in the early stages of ISAF expansion, the CFACC and DCFACC experienced considerable difficulty gaining access to ISAF operational plans and were substantially excluded from planning processes. Consequently, instead of being proactively and coherently structured, the delivery of air effect was almost entirely reactive. The significance of this situation is impossible to appreciate unless the operational context is taken into consideration. In Helmand, the arrival of the UK Task Force (Task Force Helmand – TFH) only served to encourage the insurgency, and British troops were confronted by far stronger opposition than expected; in the east, the OEF operation Mountain Fury was launched. Then, in September, a combined Canadian, American and Afghan force mounted Operation Medusa in Kandahar Province.

In multiple actions extending right across Afghanistan, the availability of air support played a crucial role in overcoming Taliban resistance and protecting coalition forces that had come under attack. Nevertheless, by the beginning of August, the requirement for CAS was outstripping its availability. At one stage in the second half of 2006, barely 50 per cent of all TICs were being serviced; during the Medusa period, it was impossible to fulfil many requests submitted by TFH. The situation was not helped by interruptions in carrier-based air support. While it was inevitable that the carriers should periodically have been withdrawn from theatre, better coordination between ISAF and the CAOC might have prevented ground operations from being launched during periods when carrier support was suspended.

While UK involvement in Operation Herrick IV was being planned – and during the early stages of TFH’s deployment – there was a tendency in British circles to view Helmand as a UK enclave and address problems from a national perspective that paid insufficient regard to the complexity of the coalition environment. The term ‘Helmandshire’ was periodically coined. For example, the RAF’s Reaper UAVs were procured as an emergency measure in 2006 with the specific ISR requirements of UK ground forces in mind. However, after it entered service late in 2007, there was no option but to declare UK Reaper to ISAF, given that TFH were heavily dependent on ISR support from coalition – predominantly American – assets. From then on, the basic ISAF prioritisation process could and sometimes did result in British forces being ‘outbid’ for an exceptionally capable UK asset that had been purchased on their behalf, and Reapers could also be diverted from planned activity to TICs or other high-priority tasks.

Weaponisation of RAF Reapers in May 2008 complicated the issue further. Weapons carriage reduced the duration of Reaper missions and increased servicing requirements. It was therefore not necessarily welcome to ground units with a particular need for long-duration ISR coverage. Nevertheless, the high demand for combat air power ensured that there was strong support for weaponisation at HQ ISAF, and there was even pressure to declare UK Reaper as a CAS asset. As the UKACC put it,

Organisational, tasking and even ‘how-best-to-fight’ issues abound. ISR and CAS requirements keep growing, and bidders grow more vociferous, but the UK has to find that twisting path that allows us to employ this dual-role platform for the purpose [for which] it was procured whilst capitalising on its all-encompassing capabilities.

In the end, UK Reaper was categorised as Armed ISR. This meant that it was not assigned to CAS tasking in the ATO, but its weapons could be employed if the need or opportunity arose. The impasse was only resolved by the delivery of more Reapers to the RAF, which led to the establishment of a second and then a third ‘line’ of coverage in 2010. With the first and second lines declared to ISAF, it was possible to reserve the third entirely for the support of UK ground units by accepting some relaxation of centralised command and control. The Reaper episode illustrates how the acquisition of improved capability could only partly satisfy the air support requirements of British forces in Helmand after Herrick IV was launched. More far-reaching solutions were required that fully acknowledged Herrick’s status as a joint and coalition operation.

Within Afghanistan, tactical command of RAF forces was exercised by 904 EAW at Kandahar. The air assets within 904 EAW were ultimately subordinated to the CFACC and could be tasked from the CAOC across theatre to support ISAF and American operations; they were in no way tied to TFH. Nevertheless, as the senior RAF officer positioned in southern Afghanistan, the Officer Commanding 904 EAW was directly exposed to the crisis that overtook the task force after their arrival, and he was compelled to react very swiftly. TFH deployed to Afghanistan without an air plan and without giving serious consideration to the air dimension. They engaged in minimal liaison with national and coalition air C2 before their deployment and possessed no clear understanding of how the air command chain functioned, the capabilities available or the best means by which they could be exploited. Constrained by their lack of preparation and unable to fathom the complexity of the air C2 chain, they were soon mimicking other ground formations and units by seeking air support via multiple haphazard requests, often submitted at the last minute or when they actually came under fire.

This regrettable situation should ideally have been addressed at higher command levels to produce ‘top-down’ theatre-wide solutions. Unfortunately, owing to the difficulties already described, there was no realistic prospect that this approach would achieve significant progress in the near-to-medium term, if ever, whereas the situation in Helmand demanded urgent action. In the UK, the belated realisation that ALI in Afghanistan left much to be desired led directly to the re-launch of Project Coningham-Keyes, an initiative that originated in Operation Telic, but this would also take time to produce results. Seeking a more immediate solution, the OC 904 EAW therefore established what was at first

known as the Air Planning Team; within a few months it was renamed the Deployed Air Integration Team (DAIT) – a title that more accurately reflected its true role.

The DAIT resided at the air/land interface and included personnel located forward at the TFH headquarters (in addition to the normal compliment of air staff officers attached to deployed brigades). It comprised SO2 specialists in the key disciplines of ISR, offensive air support (‘effects’) and tactical air transport – new posts that were added to the establishment of 904 EAW and filled by personnel sent out from the UK. The DAIT’s functions were many and varied and developed considerably over time as the campaign evolved. It played a vital role in assisting TFH and UKSF operational planning by monitoring planning activity, securing as much advance warning as possible of emerging plans and accompanying requirements for air power, and helping to match tasks and capabilities. The DAIT’s services could also be used during on-going operations and in subsequent lessons identification; and it helped to streamline interaction between air and land, working to develop tactics, techniques and procedures to ensure the provision of effective air support.

The DAIT provided a channel for feedback, whether air to land or land to air, and a link between TFH, higher levels of the air C2 chain and individual air detachments. Additionally, it supplied advice on available air capabilities and on capabilities under development (or due for deployment to Afghanistan in future) so that they could be fully exploited by TFH; it also advised the broader ISAF land community on RAF capabilities and on other RAF-related issues. Drawing on their intimate knowledge of the land perspective, the DAIT staff provided so-called reach-back to UK support agencies – AWC, DSTL, QinetiQ, industry – reporting on the employment of particular capabilities and making recommendations for improvement. Furthermore, as well as supporting TFH, the DAIT maintained constant liaison with the main air C2 nodes and with higher levels of the ISAF command chain. A continuous round of visits, briefing sessions, meetings, conferences and seminars was fundamental to its work.

The DAIT’s utility in the context of air C2 in Operation Herrick is illustrated with particular clarity by its activities in the ISR field. During the first half of 2008, while collection capabilities were gradually improving, there was little scope for tactical innovation. However, a decisive change subsequently occurred as the insurgents increasingly switched towards the use of asymmetric tactics and the employment of Improvised Explosive Devices (IEDs) on a massive scale. ISR offered the most obvious and direct source of protection from this new menace via the collection of intelligence on IED manufacture, emplacement or triggering. Pressure therefore increased both to expand ISR resources and improve the utilisation of assets already available.

June witnessed some important advances in collaborative activity between RAF collection platforms (so-called ‘cross-cueing’), and such tactics hinted at the gains that were likely to accrue from concentrating airborne and other ISR

resources. Yet ISAF remained substantially wedded to the use of single sensor ISR assets for target development and tactical support – a thin veneer of coverage that seemed fair in relation to the requirements of supported ground formations but which provided, by comparison, a very limited capability. The competing requirements of Regional Commands, Task Forces and Brigade Groups regularly defeated efforts to demonstrate the advantages of employing layered ISR.

If it was hard to secure genuinely massed and layered ISR coverage through this system, it was also true that, when assets were made available, it was not always at the correct point in the operational cycle. At Regional Command level, the J5 (Planning) function had a far lower profile than J3 (Operations). High demands for ISR support at Brigade/Task Force level often occurred during planning and preparation for future operations, yet it proved difficult to secure priority status from Regional Command during this phase. All too often, priority was only assigned immediately before operations began or upon their commencement, by which time the demand for ISR support was in fact declining. In the meantime, other lower-tier commands engaged in preparatory activity might again be denied the resource. The situation was further complicated by the tendency for requirements to be submitted at very short notice.

While airmen could offer observations regarding the inherent weaknesses of ISAF's tasking process, there was limited scope for them to generate fundamental change within a land-dominated command chain that was either unwilling or unable to link resource allocation effectively to operational priorities. Nevertheless, significant progress was eventually achieved in December 2008 during the preparatory phase of Operation SOND Chara (Red Dagger), mounted by the Royal Marines of 3 Commando Brigade against a number of Taliban strongholds near the town of Nad-e-Ali in Helmand. Of note, 3 Commando Brigade deployed their Command Support Group to Afghanistan as a formed unit, known as the IX Group – a focal point for ISR planning, collection and dissemination. It provided a natural centre of gravity for ISR fusion.

Through the early clarification of plans between the different command levels and the co-operation of a variety of other agencies (including the CAOC and PJHQ) – processes in which the DAIT played a key role – it was possible to ensure the availability of multiple ISR platforms at an optimal stage in the preparatory cycle for SOND Chara. ISR layering, although by no means a new concept, became a reality for the first time in the context of operations in Afghanistan. Combined capabilities – SIGINT, SAR,<sup>99</sup> GMTI<sup>100</sup> and FMV<sup>101</sup> – provided extremely effective support to 3 Commando Brigade that led directly to the prosecution of several targets of opportunity.

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99. SAR – Synthetic Aperture Radar.

100. GMTI – Ground-Moving Target Indicator.

101. FMV – Full-Motion Video.

In the aftermath of the operation, the DAIT submitted detailed lessons briefs to Regional Command (South) (RC(S)) and ISAF to underline the advantages of ISR layering but faced something of an uphill struggle given the complexity of the planning environment and the intense competition for resources. Ample lead time had been one important factor in *Sond Chara* but was by no means always available. Moreover, the high prioritisation secured for the operation could not be taken for granted. Layering could only be achieved in support of one formation if others were left to manage with more limited ISR – something that was bound to be unpopular and politically awkward in a coalition environment.

In February 2009, there were still said to be ‘daily challenges in providing adequate ISR assets for coincident operations at different stages of maturity’. Obviously, HQ ISAF and the Regional Commands had a duty to provide ISR coverage throughout their areas of responsibility; it would hardly have been realistic to expect long-term prioritisation for a particular task force. So the DAIT sought to identify short periods of critical operational activity for which coverage was requested in the form of a brief ISR surge. Limited and reasonable requests for support extending for no more than four or five days were more likely to be resourced, helped gain the confidence of the tasking authority, and thus increased the probability that future requests would receive a positive response. Nevertheless, the basic tension between prioritisation and equitable sharing (which is as old as military aviation itself) endured throughout the ISAF mission in Afghanistan.

Contemporary assessments of the DAIT’s activities were overwhelmingly positive. One COS OPS at 904 EAW referred to the DAIT as the ‘UKACC’s Jewel in the Crown’, while one of the TFH brigade commanders recorded that it had ‘proved invaluable’. There is no reason to question these judgements, yet a number of variables influenced the DAIT’s effectiveness. The training and expertise of individual DAIT personnel was particularly important and it proved advantageous for future DAIT staff to conduct pre-deployment training with the brigades that they were destined to support in Afghanistan. The organisation of the brigades varied, some proving easier to work with than others, but the DAIT’s independent construct normally ensured that it was sufficiently flexible to adapt to the challenge. In time, it became clear that issues addressed in the specific context of Helmand were arising elsewhere, and the DAIT was called on to provide guidance at regional and even theatre levels, but its primary focus was provincial – supporting TFH. Nevertheless, the creation of the DAIT was a stop-gap measure and its importance diminished over time. By the end of 2011, under Project Coningham-Keyes, more than 100 RAF personnel had been embedded in TFH, Regional Command South-West (RC(SW)), RC(S), IJC and at unit level, and it was therefore decided that the DAIT was no longer required.

Meanwhile, although some general improvement of air C2 evidently occurred, it is difficult to establish whether the recorded advances were either

significant or enduring. In 2007, one UKACC referred to the emergence of ‘a semblance of operational air campaigning in Afghanistan’ but acknowledged that ‘things are still a shade reactive rather than proactively and coherently structured.’ Similarly, his successor argued that ‘we still have some way to go before we reach the “utopia” of a coordinated, joint air and ground campaign at the operational level,’ although the RAF 1-Star at Kabul had ‘provided a welcome focus on coordinated operational planning and air C2 issues’. The next UKACC recorded that his tenure had ‘seen a steady and welcomed improvement in ISAF air C2 arrangements and working processes’ despite ‘some tension between the US (at CENTCOM and CAOC levels) and NATO/ISAF’ and ‘the lack of a clearly defined joint operational level to oversee and direct joint theatre planning’.

A number of factors lay behind the ambiguity of these pronouncements; the situation was by no means clear-cut. Some tangible steps forward were evidently being taken, although significant difficulties remained. Equally, for whatever reason, consecutive UKACCs were perhaps keen to draw attention to evidence of progress even though it was actually quite limited. And then, sometimes, the improvements were not permanent: they relied on the initiatives and actions of forward-thinking and flexible individuals who were replaced in due course through the normal rotation process, leaving the wheel to be laboriously reinvented – a process sometimes referred to as rotational amnesia. The absence of properly integrated C2 structures rendered the ISAF command chain particularly vulnerable to this problem. If better structural integration had been achieved, effective C2 might have been rather more self-perpetuating and less dependent on the outlook or inclination of specific personalities.

For all these reasons, although signs of limited progress were periodically observed, it was still possible in 2010 for the UKACC – then Air Commodore (later Air Marshal Sir) Stuart Atha – to identify shortcomings in air C2 and planning that were not fundamentally different from those reported during the early stages of ISAF expansion. Air C2 in the Afghan theatre appeared confused, convoluted and suboptimal; moreover, while air was highly responsive, it was not well integrated into the ISAF campaign. The CAOC’s attention was largely focused on basic tactical output indicators – TIC response times and JTAR fulfilment rates. In HQ IJC, there was a shortfall in air understanding and planning capability. The air scheme of manoeuvre seemed at times to be no more than the aggregate of a series of prioritised but disparate requests for air support fed upwards from the tactical level.

In Operation Moshtarak, at the beginning of the year, he sought to demonstrate how air power could be more effectively integrated into coalition planning – to stitch the air contribution into the land scheme of manoeuvre in a way that delivered persistent and intimate support. Acknowledging that this would require airmen to have an in-depth understanding of land intent and the supporting airspace control measures, he instructed the DAIT to work closely with TFH to develop a joint CONOPS to underpin the requests for air support

that were likely to flow through higher headquarters after Moshtarak began. He was determined that the RAF's support for the operation should not merely comprise a multiplicity of JTARs. Instead, his objective was a scheme of manoeuvre that included RAF force elements operating directly in support of TFH, bounded by time, space and objective.

The result clearly represented a substantial advance. The UKACC was convinced that part of the reason for this success was the willingness of TFH to include airmen in the planning process, and he was particularly impressed 'not simply in terms of outputs, but by the manner in which these outputs were devised jointly by TFH/RC(S) and 903/904 EAWs, then woven into the air planning process by 83 EAG'. A detailed concept for the employment of air power had been driven 'bottom up', which was, in his view, appropriate in a COIN campaign. However, neither the CAOC nor the IJC had welcomed this approach, and they continued to prefer the JTAR process. This is perhaps one reason why Moshtarak has the appearance of a somewhat isolated episode.

Broadly similar observations might be made in relation to another UKACC initiative launched in the same period. This was Project BIISTO – British Integrated ISR Support to Operations – which was intended to ensure that new ISR collection capabilities were exploited to the full. These included additional Reapers, ASTOR (soon renamed Sentinel), upgraded Nimrod R1s, Shadow R1s and Tornado GR4s equipped with the RAPTOR reconnaissance pod and the Litening III targeting pod. Project BIISTO aimed to improve the synchronisation and integration of UK ISR capabilities into the operational design for Afghanistan, such as it was. This was to be achieved by bringing together a team of specialists drawn from various ISR-related nodes to influence the ISAF tasking process and maximise the synergies of the various air and ground ISR platforms, as well as securing improvements in reach-back to UK agencies and in areas such as cross-cueing and intelligence exploitation and dissemination.

In such a broad multi-national operation, the UK's capacity to engineer significant change should not be exaggerated. Even in 2009, the US was providing an estimated 80-90 per cent of all airborne ISR assets and output in Afghanistan. Yet British aspirations to improve the direction and exploitation of ISR were well aligned with General McChrystal's priorities when he became Commander ISAF. Ultimately, the work conducted under project BIISTO is said to have achieved significant advances in integrating ISR planning, execution and reporting activities. At 904 EAW, it was noted that 'the interaction between RC(S), TFH, TFL,<sup>102</sup> SF and UK Air has never been better, and this is a tribute to the group of people who have worked ever closer to exploit the many opportunities open to them.' The OC 904 EAW reported that the BIISTO work strands had identified many opportunities for improving the effectiveness of UK ISR assets and processes in theatre, and that lessons from BIISTO had been fed

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102. TFL – Task Force Leatherneck, the Marine Expeditionary Brigade in Helmand.

into other project work and used to support the UK-based training of ISR specialists destined to deploy to Afghanistan and Al Udeid. Nevertheless, at the end of his tour, the UKACC considered that ISR tasking procedures still lacked the sophistication necessary to exploit the capabilities of the systems available to the maximum possible extent.

Subsequently, the use of so-called Mission Type Orders (MTOs) brought some improvement. Essentially, this was a narrative form of tasking based on the mission and the collection resources needed to achieve it within a given period, rather than a request for a specific platform or a narrowly defined requirement for information. MTOs were drafted at task force level and validated at Regional Command and IJC before being forwarded to the CAOC. Thus, they provide a further illustration of how ‘bottom up’ may be preferable to ‘top down’ in COIN. They gave regional and lower-level commanders considerably more flexibility in determining how assets were employed than the established collection processes and were therefore more suited to the highly dynamic operational environment. For example, in one operation in the Upper Gereshk Valley in September 2011, MTOs gave TFH the means to task the collection assets allocated to the operation and thus the tactical freedom to fuse and exploit intelligence without reference to higher authority. Yet the introduction of MTOs only resulted in a partial improvement in the direction of ISR assets; when they were not employed, key concepts such as massing and layering were rarely achieved.

The broader air C2 changes instituted from 2010 onwards were intended to improve the integration of air and land planning at the operational level and, to that end, incorporated a degree of decentralisation from the CAOC for the first time. The emphasis was on enhanced links between air and land at all levels *in Afghanistan* ‘to understand the operational design of the campaign and to translate that design into measurable airpower objectives’.<sup>103</sup> The results were impressive. According to one account published in 2012, the air component succeeded in obtaining ‘a seat at the table for every major strategic and operational discussion that occurred’ during the course of the year.<sup>104</sup> Similarly, the UK Director Air Operations at IJC remarked that ‘the structural evolution, coupled with CFACC’s clear direction to support the joint commander with whatever he requires, has resulted in a greatly improved and coherent air contribution to the COIN campaign.’

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103. Major General Charles W. Lyon and Lieutenant Colonel Andrew B. Stone, ‘Right-Sizing Airpower Command and Control for the Afghanistan Counterinsurgency’, *Air and Space Power Journal*, Summer 2011, p. 6.

104. Major General Tod D. Wolters and Lieutenant Colonel Joseph L. Campo, ‘Team Building: The Next Chapter of Airpower Command and Control in Afghanistan,’ *Air and Space Power Journal*, May-June 2012, p. 6.



Sir Stuart Atha, photographed after promotion to Air Vice-Marshal; as Air Commodore, he served as UKACC from 2009 to 2010 and initiated Project BIISTO – British Integrated ISR Support to Operations.



A 39 Squadron Reaper operating from Kandahar in 2012.



1 Squadron completing the Harrier's final operational deployment, Kandahar, June 2009.



Tornado GR4s at Kandahar in October 2010.



A Tornado GR4 taking off from Kandahar, January 2011.

Yet some familiar problems still emerge in the reports from this period. As the security transition was extended across Afghanistan, it appeared to the CFACC that a coherent air strategy was required to support the changing situation on the ground. He therefore convened an air strategy conference at the beginning of 2012, but it produced no tangible advance in the way air power was utilised because there was still too much uncertainty about the coalition's ultimate withdrawal: there was no defined end state and no clarity of the means that would be available or of how withdrawal would be achieved. So the CAOC remained largely focused on responding to IJC-generated air support requests or TIC events. The CFACC himself observed at the end of the year that 'the application of air power in Afghanistan had, arguably, become wholly reactive in nature.' In his view, the air component served almost exclusively in a support role.

Furthermore, even if there was some improvement, it can only be described as belated. It is impossible to escape the conclusion that much of ISAF's campaign in Afghanistan was conducted with suboptimal air C2 arrangements, particularly during the years when the coalition was still aiming to defeat the Taliban. When USAF staff sought to illustrate the effectiveness of the revised air C2 measures, it is notable that they cited in their support deliberations surrounding US force reductions during the autumn of 2011.

With TICs and Priority JTARs continuing to guide the utilisation of air power as the coalition drawdown progressed, resources once more became severely stretched. Such was the pressure on combat air power that an entirely novel approach to tasking ultimately became necessary. Analysis demonstrated that 70 per cent of TICs occurred in just three areas during 2011 – Nuristan and Paktiya provinces in the east, and the Helmand-Kandahar corridor in the south. The CAOC and IJC therefore devised a new tasking model that took account of this geographical trend as well as the relative priority of individual ground operations, and aircraft were pre-positioned over historic hot-spots to provide Airborne CAS (XCAS).

This system worked to the extent that average TIC response times were afterwards maintained at the levels recorded in 2011 – approximately eight minutes – despite the availability of fewer aircraft, but there was a price to pay. JTAR fulfilment rates dropped, and air support was sometimes requested from areas that had not previously witnessed many TICs. In such circumstances, in the absence of XCAS or aircraft fulfilling JTARs nearby, TIC response times could sometimes increase well above the established norms.

Fortunately, the accelerating coalition troop reductions finally translated into a substantial fall in air support demands during 2013. By February, the availability of fixed wing air power actually exceeded support requirements. The average number of JTARs requested per day during the 2013 fighting season was 45.5 – a 42 per cent decrease; by the end of December, a 54 per cent year-on-year decline in the number of JTARs had been registered. Yet unanticipated spikes in

demand had still to be carefully managed throughout the last twelve months of the operation.

One of the most consistent themes to emerge from this study of air C2 in Operation Herrick concerned the importance of the embedded RAF personnel in the CAOC at Al Udeid. The UKACC worked alongside the DCFACC; other key RAF positions included the CAOC Director (on four-month rotation), the Battle Cab<sup>105</sup> Director, the Chief of Combat Operations and the Deputy Director of the Strategy Division. A UK Deputy Director was also appointed to the ISR Division during the later stages of Herrick. These positions allowed the RAF both to understand and influence USAF planning and thinking, and the C2 contribution provided by their occupants was greatly appreciated by the Americans. Moreover, the presence of RAF embeds in the CAOC periodically brought direct benefits to British ground forces in Afghanistan.

At the same time, the UK's capacity to exert influence at Al Udeid had to be safeguarded, not only through the appointment of high-calibre individuals to the embedded posts but also through periodic measures to increase the RAF's contribution in Afghanistan. The strain imposed on coalition air resources during 2010 ultimately led the UKACC to call for the dispatch of more Tornado GR4s to Kandahar not only to enlarge the available ground-attack force but to maintain the UK's influence and standing in the CAOC. The temporary deployment of two additional GR4s was subsequently approved. In March 2012, when operational pressures again threatened to overwhelm the available combat air assets, the RAF responded by 'dual tasking' one of their Reapers for both ISR and CAS and extending one of the daily GR4 missions. Even such limited measures were enough to secure an abundance of goodwill among the CFACC's most senior staff.

## **Target Engagement and Targeting**

The application of ROE in Operation Herrick was guided by a series of tactical directives issued by COMISAF. From the later months of 2007 onwards, there was a shift towards more stringent application of the rules to limit the use of force and the potential for civilian casualties. The tactical directive issued in 2008 explicitly recognised that the support of the Afghan people – so critical to the defeat of the insurgency – might well be undermined unless the coalition employed more restraint.

We must clearly demonstrate proportionality, requisite restraint and the utmost discrimination in our application of firepower. Leaders at all levels must factor into their battle command decisions the possibility of unintended consequences such as

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105. The Battle Cab is the primary command cell in the CAOC.

civilian casualties or property damage versus the military gains of the application of firepower into populated and built-up areas. We may have more to gain by letting an insurgent go than we do by engaging the insurgent and risk the possibility of causing civilian casualties or destroying an Afghan's home and personal property ... In the application of air to ground and indirect fires, commanders must focus upon the principles which attach to that use of force ... Good tactical judgement, necessity and proportionality are to drive every action and engagement involving such fires; minimising civilian casualties is of paramount importance.

In July 2009, General McChrystal reiterated the need for restraint in a directive that pointed, once again, to the importance of ordinary Afghans. Gaining and maintaining popular support was defined as the 'overriding operational imperative – and the ultimate objective of every action we take', and McChrystal contended that victory would come not from killing insurgents but from separating them from the centre of gravity – the broader population. 'We must avoid the trap of winning tactical victories – but suffering strategic defeats – by causing civilian casualties or excessive damage and thus alienating the people.'

I expect leaders at all levels to scrutinize and limit the use of force like close air support (CAS) against residential compounds and other locations likely to produce civilian casualties in accordance with this guidance. Commanders must weigh the gain of using CAS against the cost of civilian casualties, which in the long run make mission success more difficult and turn the Afghan people against us ... The use of air-to-ground munitions and indirect fires against residential compounds is only authorised under very limited and prescribed conditions ... This directive does not prevent commanders from protecting the lives of their men and women as a matter of self-defence where it is determined no other options are available to effectively counter the threat.

General McChrystal's tactical directive, which was soon reinforced by his so-called Counterinsurgency Guidance, has been the subject of much debate ever since. It came close to the contention that coalition objectives were more likely to be achieved by holding fire than engaging the enemy, and it appeared to some commentators to impose excessive constraints, handing the tactical advantage to the insurgents and causing unnecessary casualties among ISAF forces, who were often unable to call in urgently needed fire support. The directive also emphasised the role of 'leaders' and 'commanders' in self-defence actions at the expense of the individual right to self-defence. This implied some loss of automaticity where

self-defence was concerned and closer scrutiny by higher command echelons. Whatever the truth is, there can be little doubt about how the directive was interpreted by coalition forces in Afghanistan. COMISAF's instructions were, it seemed, to be less kinetic, particularly where air-to-ground and indirect fires were concerned and even when self-defence was involved. Strict observance of the directive not only impacted on the actions of ground commanders and FACs – known in Operation Herrick as Joint Terminal Attack Controllers (JTACs); it also imposed a greater burden on aircrew.

In August 2010, the new COMISAF, General David Patraeus, issued a further tactical directive that sought to restore the balance between applying force and restraint. As the UKACC put it, 'The change-over of ISAF Cmd at the start of Jul precipitated a modification to the policy of "courageous restraint", with more emphasis placed on achieving results.' Although Patraeus agreed with McChrystal on the need to maintain popular support and on reducing civilian casualties to the absolute minimum, his directive employed very different language in other respects, committing ISAF to the 'relentless pursuit of the Taliban and others who mean Afghanistan harm' and reasserting the importance of 'killing, capturing or turning the insurgents'. It also stressed 'the right and obligation of self-defence of coalition forces'. ISAF was directed to 'take the fight to the enemy and protect the Afghan people'. However, after a period of decline between 2008 and 2010, the number of civilian casualties caused by air-launched munitions<sup>106</sup> rose again in 2011. Subsequent tactical directives reverted to more restrictive guidance on the application of ROE and drove down civilian casualty rates during the final years of the operation.

The ROE employed by ISAF forces during Operation Herrick were designated either for defensive or offensive scenarios. Aircrew – along with all other ISAF service personnel – were permitted to use force in self-defence. For such nations as the United States – in accordance with their domestic law – self-defence could be lawfully employed in response to hostile actions or acts of hostile intent, even when there was no imminent threat to life. For others, notably the UK, self-defence could only be used in response to an imminent threat.

However, two NATO ROE, 421 and 422, allowed them to engage within the Laws of Armed Conflict in response to enemy action that did *not* constitute an imminent threat, subject to the appropriate Target Engagement Authority (TEA). Specifically, ROE 421 permitted attack against persons or targets demonstrating hostile intent against friendly forces, such targets being recognisable on the basis of capability, preparations and evidence of an intention to attack, and Rule 422 permitted attack against designated persons or targets committing or directly contributing to a hostile act against friendly forces. Self-defence, ROE 421 and ROE 422 were invariably used in TIC situations against

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106. Including those launched by rotary-wing aircraft – 56 per cent of the total during the first six months of 2011, according to US sources.

rank-and-file insurgents. Rules 423 and 424 extended these basic provisions to the protection of the ANSF when they were actively participating in operations in conjunction with coalition forces.<sup>107</sup>

Offensive action during Operation Herrick was conducted by ISAF forces under ROE 429, which authorised attack on designated targets in designated circumstances. There was no requirement for hostile intent or action, or imminent or actual attack. Hostility was presumed on the basis of enemy affiliation.<sup>108</sup> In conventional warfare, where opposing sides are readily identifiable, affiliation is easy to establish. In irregular warfare, characterised by non-linear battlespace and an adversary indistinguishable from the civilian population, it becomes far more difficult. In Afghanistan, affiliation was sometimes obvious from the observed behaviour or appearance of enemy forces, but it was usually necessary to build up a detailed intelligence picture of potential targets before they could be attacked under ROE 429. This was particularly the case with insurgent leadership targets. All offensive strikes against leadership targets were executed under ROE 429 although, occasionally, it was found that they had become casualties during actions conducted under other ROE.<sup>109</sup>

ROE were only one consideration in any decision to engage. Other factors included Positive Identification (PID), CDE and, to reiterate, approval from the relevant TEA. Pattern of Life (POL) was often a further consideration, and the Law of Armed Conflict had to be observed at all times. Predictably, there was some overlap between the various release requirements and there were also changes over time. Between 2004 and 2007, GR7 pilots experienced considerable difficulty satisfying PID requirements because of the limited resolution provided by their TIALD pods, and this was a major factor in the decision to re-equip the Harrier force with high-resolution Sniper pods. UK Collateral Damage Methodology (CDM) was at first different to NATO's, but harmonisation was eventually achieved.

In a typical air-to-ground engagement scenario, the aircraft would establish a presence above the supported ground unit and make contact with the unit JTAC. The JTAC's tasks included calling in air support, supplying details of the target and agreeing the effect required. In many instances, it was only necessary to employ non-kinetic effect in the form of shows of presence or shows of force.

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107. MC 362/1, NATO Rules of Engagement, 30 June 2003, <https://www.act.nato.int/images/stories/budfin/rfp016046.pdf>, accessed 30 January 2022; UK National Archives, Baha Mousa Public Inquiry, October 2010, Module 4, Witness Statement Annex A, Serial 3, Document MIV001853, 'Platoon Commanders Battle Course – Rules of Engagement'.

108. MC 362/1, NATO Rules of Engagement, 30 June 2003, <https://www.act.nato.int/images/stories/budfin/rfp016046.pdf>, accessed 30 January 2022; UK National Archives, Baha Mousa Public Inquiry, October 2010, Module 4, Witness Statement Annex A, Serial 3, Document MIV001853, 'Platoon Commanders Battle Course – Rules of Engagement'.

109. Henriksen, *Air Power in Afghanistan*, p. 204.

Both tactics were especially advantageous in Afghanistan, given the over-riding importance attached to minimising civilian casualties. If kinetic effect was involved, the JTAC and aircrew would between them determine the best available weapon for the task and ensure the correct application of the ROE. The JTAC would then issue a so-called '9-Line' for a particular target, which was a nine-point brief covering the target description, location, marking, proximity of friendly forces, and aircraft approach and egress directions. However, it remained essential for the aircrew that the relevant ROE, PID, CDE and TEA criteria had been fulfilled, and that the engagement did not contravene COMISAF's tactical directive.

The complexity of the Afghanistan operational environment, with its multiplicity of contributing nations, made ROE alignment problems inevitable. There were especially protracted arguments over the precise meaning and application of different ROE in 2006 and 2007, but difficulties also arose when JTACs proved unfamiliar with subtle differences between UK, US and ISAF ROE. In the second half of 2008, the RAF Harrier pilots held fire on several occasions for this basic reason. JTAC training to an advanced level was essential but it was not always forthcoming, and ground personnel were rotated so frequently that perfection was never likely in any case. ISAF devoted a significant effort to raising JTAC standards in this period. Among other things, JTAC training facilities were established in theatre to supplement pre-deployment training, and RAF fast jets regularly flew JTAC training sorties from Kandahar.

As we have noted, for RAF aircraft to release munitions in self-defence (typically in defence of ground units), it was necessary under British law for both hostile intent and hostile action to constitute an imminent threat to friendly life, and the JTAC was required to confirm that such a threat existed. If aircrew were left in any doubt, they were not permitted to strike. Usually, the presence or absence of such a threat could simply be established via a direct question to the JTAC, but more probing and interrogation were sometimes needed – a complex exercise that was invariably carried out under extreme pressure. On the basis of extensive training, RAF aircrew established an outstanding reputation for their correct application of the release criteria. As the UKACC recorded in September 2009,

I am encouraged that UK aircrew regularly interact with JTACs to determine the most appropriate way to deliver the required effect. Both Reaper and more recently Tornado GR4 crews have made important judgements with respect to kinetic strikes when they have had ROE, Targeting Directive or Tactical Directive concerns.

Nevertheless, the difficulties faced by coalition aircrew in applying their ROE correctly should not be underestimated. In one of the worst civilian casualty incidents of the entire conflict, involving a US F-15 in September 2009, an attack

was executed near Kunduz after a German ground commander declared without justification that he was confronted by an imminent threat. In the absence of such a threat, it would have been necessary to seek engagement authority from a higher level, and it would almost certainly have been refused. The aircrew were obviously doubtful and repeatedly offered to use non-kinetic effect, such as a Show of Presence or Show of Force, but they lacked enough information to challenge the ground commander and eventually conceded to his demands, with disastrous consequences. In a similar episode only days later, and doubtless with the Kunduz incident very much in mind, an RAF GR4 crew rejected a request to bomb an abandoned Taliban arms cache.

During the early stages of Operation Herrick, the ROE were applied with extreme care and caution, but their application became far more difficult during the crisis that overtook ISAF in the second half of 2006. As coalition troops frequently found themselves under threat from substantial bodies of Taliban fighters employing relatively conventional fire and movement tactics, they were authorised to interpret their ROE more aggressively and employ pre-emptive strikes when the need or opportunity arose. However, the level of approval required for the release of air-to-ground weapons in such circumstances was the subject of considerable disagreement. The onus fell heavily on aircrew to ensure that all the elements of the ROE had been satisfied and that the necessary permissions had been obtained from the correct agencies. As 2007 wore on, this situation caused mounting concern at higher command levels at a time when rising civilian casualties were generating political unease and strident protests from the President of Afghanistan, Hamid Karzai. It was increasingly considered that the ROE were not being employed correctly, and strict curbs were eventually imposed.

Throughout, ISAF forces could exercise their inherent right to engage in self-defence, and ISAF commanders were cleared to approve the use of force in defensive circumstances. They could also authorise offensive action involving ISAF assets. However, for CFACC assets, different procedures applied. In October 2007, clearance for fixed-wing combat aircraft to conduct offensive engagements was raised to CAOC level and, for US assets (the vast majority) CENTCOM level. This course of action inevitably extended the time involved and substantially reduced the likelihood of an attack. The requirement for the CAOC to authorise offensive engagements caused particular difficulties where insurgent leadership targets were concerned as they tended to be fleeting in the extreme. All too often, targets escaped after momentary opportunities to capture or kill them were missed. In November 2008, 904 EAW reported that several missions had been aborted due to the time involved in obtaining clearance to engage.

This subsequently became a bone of contention and another illustration of the troubled relationship between HQ ISAF and the CAOC. By the end of the year, ISAF was pressing hard for leadership targeting to be run from Kabul – a

concept supported by the then Commander CENTCOM (and later Commander ISAF), General Patraeus; but the DCFACC strongly opposed delegation. As he wrote later (referring to leadership targeting as TST),

We had intimate knowledge of how TST was run at CENTCOM and the CAOC, and we had a very good idea of ISAF's lack of capability to perform this task. I felt the demand from Kabul to control and if necessary command sensitive air targeting got out of hand. The ACE was simply not organized, trained, or equipped to handle the complexities of the process or the authority to execute a strike.<sup>110</sup>

Eventually, he issued an ultimatum to the ISAF ACE:

We were not going to strike any targets in a time-sensitive manner that excluded the CFACC's authority until they cleaned up their act and obtained all the proper equipment to generate, assist, facilitate, and verify the safe conduct of time-sensitive targeting in theater.<sup>111</sup>

The Director ACE later recorded that this involved the creation of a new Dynamic Targeting Operations Centre at ISAF and the acquisition and training of additional intelligence specialists, imagery analysts, targeting and joint fires experts and other operational personnel. Reliable PID, POL, CDE and TEA processes had also to be firmly established.<sup>112</sup>

The new capability was trialled in February 2009 and declared fully operational. The ISAF leadership targeting system, based on a so-called Joint Prioritised Effects List (JPEL) was described by a former Director ACE and ISAF Deputy Chief of Joint Operations in the following terms:

ISAF's JPEL was an intelligence-generated roster of various leaders and senior members of the Taliban, al-Qaeda, and other terrorist organizations. COMISAF approved each JPEL objective personally, with the joint operations division responsible for carrying out targeting operations against the objectives. Potential JPEL objectives were recommended to COMISAF for consideration based on a formal intelligence-gathering process and assessment. Placing a terrorist objective on the JPEL roster was, in itself, declaring the objective "hostile." The objective could be

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110. Henriksen, *Air Power in Afghanistan*, p. 145.

111. Henriksen, *Air Power in Afghanistan*, p. 145.

112. Henriksen, *Air Power in Afghanistan*, pp. 203-204.

engaged by the ISAF coalition without the need for a hostile act or demonstration of hostile intent ...The review and approval authority for offensive direct-action missions was delegated to and carried out by the Chief of Joint Operations and his deputy, the Director ACE. COMISAF and his two joint operations two-star generals were ISAF's strike approval authorities for missions that targeted JPEL objectives in a dynamic and time sensitive manner.<sup>113</sup>

Trial and approval of the Dynamic Targeting Operations Centre did not at first clear the way for theatre air assets to strike JPEL targets without reference to the CAOC. The scope for air-to-ground weapons launched from altitudes of more than 10,000 ft to cause collateral damage remained a major obstacle to agreement between Kabul and Al Udeid. At first, therefore, engagement had still to be approved by the CAOC on a case-by-case basis. However, in the spring of 2010, the Tornado GR4 detachment received standing authorisation from the CAOC to employ Dual Mode Seeker Brimstone (DMSB) against JPEL targets – a reflection of the weapon's small size and exceptional accuracy. Yet when the GR4 detachment launched missions against the insurgent leadership, they were confronted by a series of problems. Despite its extreme precision, DMSB was almost too small for some targets, and individual insurgents were often difficult to identify from medium altitude. Most of all, counter-leadership missions tended to be protracted and expensive in terms of flying hours. As the OC 904 EAW put it, 'These hours are burning into TorDet's limited bank of funded activity and diverting the ac from other TICs or JTARS.'

Reaper UAVs offered a potential solution due to their high endurance, and Reaper's Hellfire missiles were no less accurate than DMSB; but Reaper had only recently been procured by the RAF – primarily for ISR – and was still something of an unknown quantity. Moreover, it belonged to a new generation of remotely-piloted aircraft (popularly referred to as 'drones') that had been the focus of much uninformed and largely unfounded adverse media comment. Reaper operations were therefore subject to tighter political constraints than those conducted by conventional manned aircraft, and particularly rigid restrictions were applied to the employment of weapons by the US and UK targeting authorities to minimise collateral damage risks.

Not until the following spring were these constraints relaxed. By then, experience was demonstrating that many of the concerns formerly expressed about Reaper strikes were unfounded. Engagements conducted during extended missions that kept insurgent leaders under observation for hours on end involved considerably lower collateral damage risks than strikes by conventional manned assets that had only recently reached the target area. At the same time, General

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113. Henriksen, *Air Power in Afghanistan*, pp. 203-204.

Patraeus's tactical directive had committed ISAF to the 'relentless pursuit of the Taliban and others who mean Afghanistan harm', and the ACCE's influence in Afghanistan was being significantly extended; this may have given the CAOC more confidence in ISAF air C2. And so it was that the CFACC accepted that he could safely delegate authority for Reaper to engage JPEL objectives, and this invaluable asset was subsequently used to execute the vast majority of attacks on insurgent leaders. The greater emphasis on their elimination added a more deliberate dimension to air targeting during the later stages of Operation Herrick, but offensive strikes remained very much the exception to the rule where non-JPEL targets were concerned.

For RAF combat aircraft, targeting throughout Operation Herrick was controlled by the UK TD, which was issued by CJO and updated periodically. While the system of tiers and estimated civilian casualty levels endured, the delegated target sets were inevitably very different from those defined by earlier TDs covering action against conventional adversaries. For example, the target categories were all terrorist or insurgent organisations – Al Qaeda, Hezb-e Islami Gulbuddin and the Taliban. Within each category were camps, training and planning facilities, vehicles, troops and equipment, leadership and fielded forces. All delegated target sets were subject to a civilian casualty estimate of zero, and all the supporting targeting methodology was meticulously designed to minimise the risk of collateral damage.<sup>114</sup> Yet even the most exacting engagement clearance requirements must to an extent be intelligence-dependent. The one documented civilian casualty incident during Operation Herrick involving the release of weapons by an RAF aircraft – a Reaper – was exhaustively investigated by ISAF, and the investigation confirmed that the Reaper operators had followed the correct procedures and had properly applied UK ROE. Civilian casualties occurred not because of a failure to follow procedure but because the supporting ISAF ISR assets did not observe civilians boarding the two targeted vehicles.

At the beginning of Operation Herrick, UK targeting doctrine incorporated rigid distinctions between deliberate, pre-planned targeting, dynamic targeting and TST. However, in Afghanistan, pre-planned targets were few and far between, and targeting was overwhelmingly dynamic or time-sensitive. There were two basic types of dynamic targeting. Unplanned targets were targets known to exist in the operational environment, while unanticipated targets were targets that were unknown or not expected to exist in the operational environment.

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114. For the applicable US/NATO collateral damage estimation methodology, see CJCSI 3160.0, No-Strike and The Collateral Damage Estimation Methodology, 13 February 2009, <https://www.justsecurity.org/wp-content/uploads/2017/04/Collateral-Damage-Estimation-Methodology-CJCSI.pdf>, accessed 30 January 2022; this was superseded by CJCSI 3160.01A dated 12 October 2012, <https://info.publicintellgence.net/CJCS-CollateralDamage.pdf>, accessed 30 January 2022.

In either case, it was unusual for aircrew to take off with much detailed knowledge of the targets they would be required to prosecute. Consequently, they found themselves critically dependent on JTACs for accurate target information and often had no way of knowing if information was inaccurate prior to weapon release. Fratricide was only narrowly avoided on several occasions after JTACs (including UK JTACs), in the heat of battle, passed their own coordinates to supporting combat aircraft rather than the coordinates of the target. As late as March 2012, it was still possible for a JTAC to pass an entirely inaccurate target position to an RAF GR4. A munition was duly launched – fortunately into an open field – but the aircraft’s sensors afterwards confirmed that it had impacted at the coordinates supplied from the ground.

Unplanned targets typically emerged when aircraft were tasked to fulfil a specific request from a ground unit – a JTAR. Aircraft assigned to a JTAR usually provided over-watch of ground movement or action in the expectation that targets would probably emerge. Although, in general, the quality of JTARs improved over time, their standard remained uneven throughout Operation Herrick as different ground formations rotated into and out of theatre. Weaknesses included requests for support that aircraft were not equipped to provide, and requests that contained inadequate information about the supported ground mission. On receiving JTARs, air detachments had frequently to submit follow-up requests for more detailed ground manoeuvre plans, locations and objectives. Some ground elements proved more willing than others to divulge these details.

The JTAR represented the normal means by which air support was requested by ground units throughout Operation Herrick. However, the tasked aircraft, once airborne, might then be diverted to support other units confronted unexpectedly by hostile action in a TIC. In such circumstances, the top priority assigned to TICs in the allocation of air support often meant that the original JTAR went unfulfilled. To make matters worse, while the majority of TICs were genuine, the system was misused by some ground units unfamiliar with (or distrustful of) the normal JTAR process. TICs were periodically called and kept open without justification.<sup>115</sup>

The allocation of aircraft between on-going planned operations and emerging TICs was determined centrally by ISAF in collaboration with the CAOC until 2010. Subsequently, a measure of decentralisation to Regional Command level was agreed. The aim was to reduce the potential for vital air assets to be diverted from high-priority activity to TICs when other aircraft could be made available within slightly longer response times without significant additional risk to the troops in contact.

Now, the RC commanders ... had the ability to divert the nearest Predator or not, depending on the specific situation. This was a

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115. Henriksen, *Air Power in Afghanistan*, pp. 218, 250.

risk they assumed, and it was a risk they were willing to assume because they knew the situation on the ground better than anyone else.<sup>116</sup>

In time, a system of Priority JTARs was also instituted covering requests for air over-watch deemed more important than routine activity. Again, the CAOC agreed that this distinction should be made by the responsible operations staffs at Kabul and at Regional Command level.

## **Conclusion**

Ideally, given the nature of counter-insurgency warfare, air C2 in Operation Herrick should have been exercised at a lower level than the CENTAF CAOC at Al Udeid. It would have been better if an air headquarters with extensive, delegated C2 authority commanding dedicated air assets had been positioned in Afghanistan. Yet this would have necessitated one of two prior courses of action. Either ISAF would have had to accept the formal integration of CENTCOM and ISAF air C2 machinery or it would have had to establish facilities, structures and procedures of a comparable standard to the CAOC's.

Neither course was followed. NATO steadfastly rejected proposals to integrate the CENTCOM and ISAF air C2 chains and, from the perspective of the CENTCOM CAOC at least, created manifestly inferior air C2 machinery. The mere complexity of air C2 after 2006 should have been enough to demonstrate that it was deeply flawed. While the situation was helped to some degree by the extension of the ACCE's activities after 2009, it was not until December 2011 that ISAF finally agreed that the commander of the ACCE should also hold the post of DCOS Air – a concession implicitly acknowledging that some such approach should have been adopted at the very beginning of ISAF expansion.

In these circumstances, as the vast majority of theatre air assets were provided by CENTCOM and as the USAF in any case retained a very strong doctrinal attachment to the concept of centralised air C2, the CAOC was always bound to approach the issue of decentralisation very cautiously indeed. The issue was rendered more complex still by the critical importance attached to minimising civilian casualties, by periodic signs that ROE were being misused, and by mission reports indicating that some JTACs were more proficient than others. The Kunduz incident in September 2009 illustrates some of the key factors with particular clarity. The ingredients included a USAF fast jet, a German ISAF ground commander, the flagrant abuse of defensive ROE by the ground commander, and a very high civilian death toll incurred only shortly after Commander ISAF issued a Tactical Directive that attached overriding importance to minimising casualties among the ordinary Afghan population. In the light of

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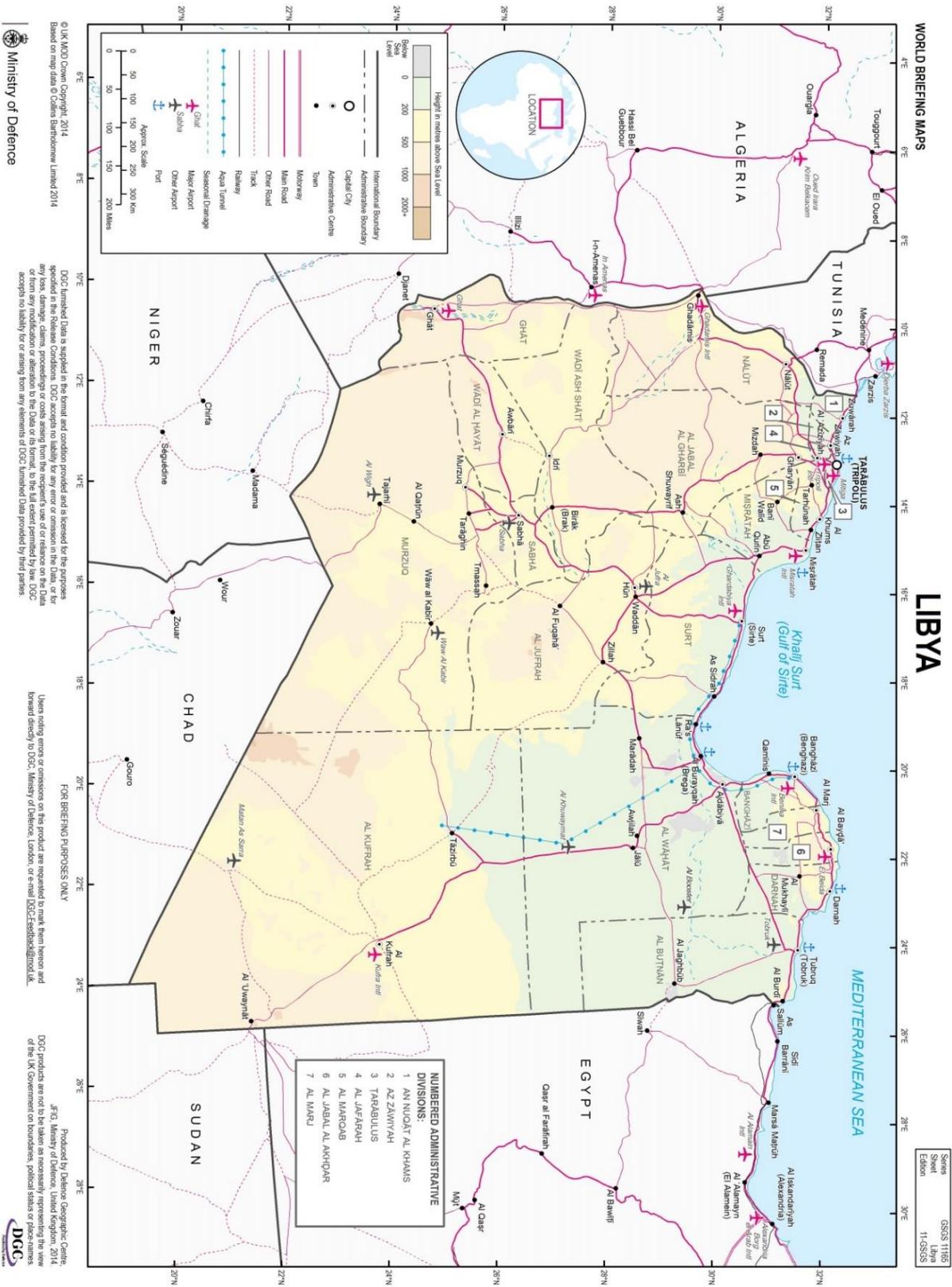
116. Henriksen, *Air Power in Afghanistan*, p. 251.

episodes such as this, we can hardly be surprised that the CAOC continued to doubt ISAF's competence and remained reluctant to delegate C2 in the absence of senior USAF representation at HQ ISAF (or, after 2009, IJC).

The adverse consequences were many and varied. Distrust was clearly a major factor in the CAOC's long-term reluctance to delegate leadership target engagement authority to ISAF, but the absence of effective C2 structures had far wider implications. ALI is the acronym for Air-Land Integration but the term 'disintegration' would have been more appropriate in Operation Herrick. ISAF land elements dealt directly with the ISAF air C2 chain in Kabul while the key role in *providing* air power was played by the US CENTCOM CAOC, which was located far from Afghanistan and which had no formal presence within the ISAF C2 machinery.

The yawning gulf between land and air C2 made integrated planning virtually impossible and encouraged the ground forces to devise their operations without air input, or else add air into plans at the last moment. As always, prioritisation was vital in the allocation of air power, but it proved particularly difficult to achieve when the over-riding priority was assigned to TICs, which were unplanned, when TICs were called and kept open on questionable grounds, or when ISAF insisted on the 'equitable sharing' of air assets across task forces and regions. All of this was hugely frustrating for the many airmen who believed that air power could be far more effectively exploited in Afghanistan, although some senior air offers were apparently content for the air-land relationship to be conducted at arm's length through the media of TICs and JTARs.

Against this background, the UK struggled to find a way forward. The early tendency was to view Herrick as a national operation, but it proved impossible to reconcile this approach with the reality of coalition warfare in Afghanistan. Solutions could only be found by working with the coalition command chain and exerting influence within key C2 nodes. The DAIT provides the best illustration, but there were other examples, such as Project BIISTO and the efforts to integrate air and land planning before Operation Soud Chara. In the longer term, the embedded RAF personnel in the CAOC played a significant role, and Project Coningham Keyes ultimately increased the RAF's presence within TFH and ISAF C2 structures. On a larger scale, the USAF's influence was extended through the medium of the ACCE and 9 AETF. Yet progress was uneven and too long delayed to affect the outcome of the operation in a decisive sense. Air power helped to contain the insurgency but not defeat it. It is only possible to speculate on whether more might have been achieved had air power been more effectively integrated into ISAF operations at an earlier stage.



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## **OPERATION ELLAMY: LIBYA, 2011<sup>117</sup>**

Operation Ellamy was the UK contribution to Operation Unified Protector, the seven-month air and maritime campaign waged against the regime of Colonel Muammar Gaddafi in Libya by a coalition of NATO and allied states. The operation (initially named Odyssey Dawn under a brief period of American leadership), was launched at short notice in response to the regime's efforts to suppress the mass rebellion that engulfed Libya in February 2011, itself part of the broader wave of popular uprisings then sweeping through North Africa and the Middle East – the so-called Arab Spring. Military action was initiated in support of UNSCR 1973, which not only created a no-fly zone in Libyan airspace but also authorised the use of all necessary measures to protect civilians and civilian objects on the ground. While contributing to the coalition no-fly zone, deployed UK fixed and rotary-wing aircraft flew some 3,000 sorties out of a coalition total effort of 26,320, including 2,100 strike sorties out of 9,658; UK aircraft attacked 640 targets. This impressive effort was mounted alongside Operation Herrick, which was characterised as the main effort for UK defence.

At the start of operations over Libya, the coalition confronted an adversary that still controlled most of the country. Assessments of regime strength at this stage can only be approximate, but the backbone of Gaddafi's army, the Regime Protection Force, was intact and numbered some 30 battalions; he could also still call on the bulk of the far less capable Armed Personnel on Duty force of 85 battalions, as well as a 'People's Guard' of militia and mercenaries. Their inventory of heavier weapons – tanks, armoured fighting vehicles, artillery pieces and rocket launchers – was thought to number more than 3,300 deployed items, including 371 main battle tanks, and there was considerably more equipment in storage. Libya also had an air force and an IADS. And yet, by mid-October, all that remained of Gaddafi's regime amounted to a handful of combatants with a single tank and a rocket launcher, fighting desperately in defence of a tiny enclave in Sirte. Within days, even this would be overwhelmed.

### **Air C2 and the Transition from Odyssey Dawn to Unified Protector**

Operation Ellamy was initiated at a time when regime forces were advancing in strength into Eastern Libya to threaten the rebel stronghold of Benghazi. Therefore, first and foremost, C2 arrangements had to be designed to manage air operations in support of the city's defence before being adapted to meet the requirements of the longer-term no-fly zone task. This suggested a US lead and then a transition to NATO leadership after the initial campaign objectives had

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117. Unless otherwise stated, this chapter is based on the unpublished AHB narrative *The Royal Air Force in Operation Unified Protector*.

been fulfilled. On the 17th, in accordance with established NATO procedure, the NAC agreed an Initiating Directive covering the establishment of a no-fly zone over Libya, which was duly circulated to member states. It was envisaged that a Combined Joint Statement of Requirements would be issued on the 18th; a CONOPS would appear the following day, an OPLAN following on the 22nd.

Meanwhile, MOD briefs outlined a three-phase plan that envisaged as Phase 0 the establishment of US command from the USAF CAOC at Ramstein, Germany, and the issue of a demarche or ultimatum to Gaddafi while the various UK, US and French force elements continued their preparations. Then, in Phase 1, NATO forces would mount TLAM and air strikes against Libya's IADS and C2, as well as forces threatening Benghazi. The aim was to stop the drive on Benghazi and reduce any threat that Libyan air defences might pose to aircraft policing the no-fly zone. In the meantime, NATO was to draw up plans for Phase 2 – the implementation and policing of the no-fly zone – when US leadership of the operation would cease.

Initially, under the Operational Command of CJO, OPCON of committed UK air assets was assigned to Air Vice-Marshal Greg Bagwell, the AOC 1 Group, functioning as JFACC, while the Commander of Operations from the Maritime Operations Centre assumed an equivalent responsibility for UK maritime forces. Eight Tornado GR4s and ten Typhoons were prepared for deployment. Of the GR4s, six were committed to NATO while two at first remained under national command. VC10 tankers, E-3Ds and a Nimrod R1 were already positioned at Akrotiri, but it was planned that two Sentinels would join them to provide ISR support. As the Nimrod R1 was due to be withdrawn from service in March, it was necessary to find sufficient funds from within the MOD budget to secure a three-month extension of duty.

On 19 March, CDS issued an Execute Order to CJO initiating operations in support of UNSCR 1973 under the UK name of Operation Ellamy. At the same time, an activation order was issued in Washington for Odyssey Dawn. Command of Joint Task Force Odyssey Dawn was assigned to Admiral Samuel Locklear on board the USS Mount Whitney – flagship of the American sixth fleet. Meanwhile, Air Vice-Marshal Bagwell deployed to Ramstein with elements of the JFACHQ, partly to ensure effective collaboration and coordination with the Americans and partly to gain a means to observe and control RAF aircraft once they were airborne. A forward HQ was also established at Akrotiri.

At this stage, Air Vice-Marshal Bagwell possessed no operational directive, TD or outline campaign plan. It was nevertheless broadly clear that the UK and other nations engaged in Operation Ellamy/Odyssey Dawn were confronted by five basic tasks. First, there was the management of the initial missions and deployments involving British, French and American contributions to the operation. Second, there was the expansion of the initial tri-nation venture into a far broader coalition of air forces functioning within a single ATO and in

accordance with the same OPLAN, ROE and SPINS.<sup>118</sup> Third, but concurrently, it was essential that operations over Libya should support the key coalition goals of establishing a no-fly zone and protecting the Libyan people from Gaddafi's forces. Fourth, this had all to be achieved in such a way that the operation could be transferred relatively easily and seamlessly from American to NATO leadership. Finally, the transfer itself had to be implemented.

Predictably enough, many challenges and hurdles were encountered along the way. The initial strikes executed largely by TLAM and Storm Shadow were primarily designed to degrade the Libyan Air Defence System – particularly C2 facilities, radar and other early warning installations, surface-to-air missile batteries, airfield maintenance buildings and storage depots. One key task for the UK and US JFACCs involved the apportionment of these targets between British and American assets. At first, France adopted a very independent posture and exercised command from a separate CAOC at Lyon. Nevertheless, the operation soon assumed more genuine coalition proportions. The normal three-day ATO cycle could not immediately be applied (although the ATO terminology inevitably was) but Danish F-16s, Italian Tornados, Canadian and Spanish F-18s were all contributing to Odyssey Dawn after a few days, along with US F-15s and 16s and AV-8Bs, RAF GR4s and a variety of French aircraft. AWACS capabilities were provided by the UK E-3Ds and a French E-3F; ISR platforms included French aircraft and a US RQ-4, an RC-135 and an EP-3, while electronic warfare was assigned to a US EC-130H Compass Call. US, Canadian and UK tankers were responsible for AAR.

The initial coalition intervention witnessed some pronounced differences in prioritisation between the leading force contributors, which was not conducive to the development of a methodical approach to targeting. Nevertheless, Odyssey Dawn succeeded in removing the immediate threat to Benghazi, and regime forces were then driven back from Ajdabiyah, through Brega and along the coast towards Sirte. It quickly became clear that any challenge from the Libyan Air Force would be limited or even non-existent and that the application of combat air power would predominantly take the form of air-to-ground tasking. Equally, it soon proved necessary to revise early assumptions to the effect that coalition aircraft should only intervene to protect civilians under attack. Pre-emptive targeting on the basis of hostile intent was essential, and ROE were amended accordingly.

While air operations over Libya were progressing, Odyssey Dawn was being transformed into the NATO-led Operation Unified Protector. Planning was based on the establishment of a typical two-tier NATO headquarters structure comprising an Air Headquarters at Izmir in Turkey and a CAOC at Poggio in

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118. SPINS are issued alongside the ATO and provide theatre or sometimes mission-specific information to aircraft tasked by the ATO. They may supply elaborating information or lay down particular procedures and constraints within which the mission must be executed.

Italy. This was situated adjacent to NATO's standing CAOC 5 and consisted of portacabins relocated from Vicenza, where they had previously been used to support NATO air operations over Bosnia and Kosovo.<sup>119</sup> The headquarters were to 'shadow' the ATO cycle maintained from Ramstein until the transition to NATO command, when they would take over responsibility for the process. Also within this period, it was essential to effect a formal Transfer of Authority (TOA) of Odyssey Dawn assets to NATO C2.

The transition was far from smooth. The schedule originally devised did not provide enough time for coalition members to familiarise themselves with the overall mission or such C2 fundamentals as ROE and target approval processes. Moreover, while it was clear that American combat air support for the operation would be substantially cut back after US leadership ceased, there was much uncertainty about the precise scale of the force reductions and thus about the shortfalls that would have to be made good by other coalition members. After the original timetable was delayed for 24 hours, TOA duly occurred on the 30th, and the first NATO ATO ran from 0600Z on the 31st. However, the Americans imposed restrictions on the participation of their combat aircraft that prevented their assignment to ground attack missions that day, and operations by other coalition members were disrupted by adverse weather. US intelligence feeds available at the Ramstein CAOC were also temporarily suspended.

Unfortunately, at this critical juncture, there was a pronounced change in the tone of intelligence reporting on the situation in eastern Libya. The rebels' advance faltered, and they were then driven back through Brega and towards Ajdabiyah. On 1 April, coalition air power – bolstered again by the Americans – halted the regime offensive, but the damage had already been done. There would be no rebel counter-attack against Brega until the middle of July, and the city would remain under regime control until 22 August. Reporting on this course of events, Air Vice-Marshal Bagwell commented that when the lessons identified from the Odyssey Dawn-Unified Protector transition were written up, they should emphasise two golden rules for military operations:

Rule 1. Do not transfer C2 in the middle of complex operations at a critical phase of the campaign.

Rule 2. If rule 1 must be broken, ensure that all combatants transfer C2 at the same time and to a common plan, procedures and operational design.

And so, in less than ideal circumstances, Operation Odyssey Dawn made way for Operation Unified Protector; the UK retained the name Operation Ellamy.

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<sup>119</sup> Major Ken Craig, 'Understanding the Combined Air Operations Centre', *Royal Canadian Air Force Journal*, Vol. 1, No. 2 (Spring 2012), p. 34.

Admiral Locklear continued to exercise overall command in his capacity as Commander Allied Joint Force Command, Naples, but the post of Commander Combined Joint Task Force (COM CJTF) Unified Protector was assigned to his NATO deputy, Lieutenant General Charles Bouchard of the Royal Canadian Air Force. His Combined Joint Task Force Headquarters (CJTF HQ) was likewise Naples-based. Bouchard was a former helicopter pilot with a subsequent command specialisation in air defence. At the time, he was serving out the final appointment of his career. At the Izmir Air Headquarters, the USAF's Lieutenant General Ralph Jodice became the CFACC (sometimes referred to as the CJFACC). The coupling of Naples and Izmir reflected a C2 relationship that was well established in NATO, but the geographical dispersion of the three key headquarters between Naples, Izmir and Poggio quickly proved far from ideal.

The UK experienced considerable difficulty securing a senior air position in the command chain, and the provisions ultimately agreed were, from an RAF perspective, unsatisfactory. In March 2011, there were no senior UK air officers in NATO's southern flank command apparatus. It had originally been expected that the UK JFACC would be co-located with the CFACC at the Air Headquarters. However, on 26 March, Air Vice-Marshal Bagwell was advised that his services would not be required in any formal command structure that came into existence after the transition to NATO leadership; there was a need for 'Indians not chiefs' at Izmir and Poggio.

At Poggio, participating nations contributed embedded staff to the CAOC organisation and deployed their own national liaison elements; given the scale of the coalition, these liaison personnel were numerous, and they became involved in all aspects of the air planning cycle.

These liaison elements possessed the authority to represent their respective nations on critical issues, and they had the responsibility of presenting national perspectives and considerations affecting combined air operations planning and execution ... One key to the success of Op Unified Protector was the ability to integrate the numerous national air force contributions into a cohesive force, an achievement only possible by establishing a CAOC that worked effectively with actively engaged and fully empowered national liaison elements.<sup>120</sup>

The first senior RAF officer dispatched to liaise with the CFACC was Air Commodore (later Air Marshal) Edward Stringer, and he now became UKACC. Other UK personnel at Poggio comprised his staff and those assigned to NATO posts in the CAOC, great importance being attached to their alignment – to ensuring that RAF elements in the CAOC were fully aware of the UK command

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120. Craig, 'Understanding the Combined Air Operations Centre', p. 34.

position and rationale on any issue. They predominantly consisted of JFACHQ staff and a range of SME augmentees. An RAF group captain was appointed chief of the CAOC's Strategy Division. The UK Air Component at first consisted of a single EAW numbered 906 and incorporating all RAF combat, ISR and AAR assets, but the ISR and AAR elements were transformed into a second EAW numbered 907 at the end of April; the commanding officer of 907 EAW also served as Deputy UKACC.

These arrangements were probably as favourable as could have been expected in the absence of an RAF 2-Star post. However, although the UK was assigned two senior positions at the CJTF HQ at Naples, the headquarters was staffed by NATO appointees and neither post was filled by an airman. Rear Admiral Russell Harding was appointed Deputy Commander CJTF and also became NCC, while Brigadier Robert Weighill served as Deputy Chief of Staff (Operations). As the RAF provided arguably the single most important combat contribution to Unified Protector, one or the other of these posts should have been assigned to an RAF officer. Instead, the RAF found itself poorly placed to exert strategic influence on the campaign.

While this was certainly unfortunate, it was but one manifestation of a broader C2 problem that confronted the RAF during the early stages of the Libyan conflict. For some years, the UK had collaborated closely with the United States in the Gulf and Afghanistan and thereby maintained a full understanding of US C2 processes, but there was far less knowledge of NATO air C2 collectively and in relation to individual partners as there had been a sharp decline in UK investment in the alliance. The many and varied C2 problems encountered in this period extended beyond the sphere of personnel and appointments and into such critically important areas as deployable and secure CIS and CIS interoperability with NATO.

The release of weapons by RAF aircraft was governed by the Joint Fires annex of NATO's Unified Protector Operation Order and by a UK TD issued early in April. Both documents broadly identified the delegated target sets as the Libyan armed forces. Targets proposed for UK assets that were not covered by the UK delegations had to be referred upwards to the MOD's targeting authorities. Targets that fell outside the NATO delegations were submitted to the NAC. Air strikes against Libyan ground targets fell under two headings, deliberate and dynamic. Deliberate targeting was defined doctrinally as the procedure for prosecuting targets that were detected, identified and developed in sufficient time to schedule actions against them in tasking cycle products such as the ATO. Conversely, dynamic targets were likely to be unanticipated, unplanned or newly detected but were generally of such importance as to warrant immediate prosecution.

The basic target approval process was very similar to the procedure applied in Afghanistan. Every target had to be assessed on the basis of ROE, CDE and PID, and only if the necessary criteria were satisfied under all three headings

could engagement be approved. NATO CDE methodology was employed, and the CDE 'level' (equivalent to the tiers previously used by the UK) also dictated the allocation of TEA status.<sup>121</sup> The overwhelming majority of air-to-ground weapon releases involved clearance from the CAOC or higher command levels, and all deliberate attacks required prior clearance. This would typically necessitate the fusion of any available target intelligence to support the ROE, CDE, PID procedure and gain the approval of SNRs (the red card holders). Predictably enough, the SNRs did not all speak with one voice, there being two rather different perceptions of the NATO mission. Some nations chose to interpret the UN mandate narrowly, focusing on the objective of protecting Libyan civilians. Others, the UK included, took a broader view in the belief that the Libyan civilians could never be fully protected while Gaddafi remained in power.

As in Afghanistan, the PID requirement was sometimes too demanding for the targeting pods fielded by the various combat air platforms, given the minimum operating altitudes required to reduce the risk posed by regime GBAD. The visual similarity of rebel and regime forces, the confused ground situation and the lack of a coalition ground presence also substantially increased the danger of fratricide – of coalition aircraft mistakenly targeting rebel troops. As a safeguard, the CAOC employed a Restricted Fire Line (RFL), which was effectively a FLOT, based on an intelligence-led assessment of ground force dispositions.

The inherent complexity of the targeting process perfectly illustrates the challenging nature of air C2 during Operation Ellamy. However, exacerbating the many and varied problems that confronted the CFACC and his staff were other distinctive characteristics of the Libyan conflict. These included the extremely large geographical area over which it was conducted, with multiple fronts, the high fluidity of the battlespace, the limited coalition intelligence picture, the fleeting nature of many ground targets, and the fact that numerous targets were located in conurbations such as Tripoli, Misratah and Brega, where there was inevitably a significant risk of collateral damage.

Against this background, and with the various national liaison elements located forward at Poggio, it did not take long for the CFACC to recognise the inherent shortcomings of the geographically separated two-tier Air HQ-CAOC arrangement. On 1 April, he moved to Poggio. On the 7th, he declared his intention to remain there and deploy key personnel forward from Izmir.

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121. For details of US/NATO collateral damage estimation methodology in this period, see CJCSI 3160.0, No-Strike and The Collateral Damage Estimation Methodology, 13 February 2009, <https://www.justsecurity.org/wp-content/uploads/2017/04/Collateral-Damage-Estimation-Methodology-CJCSI.pdf>, accessed 30 January 2022; this was superseded by CJCSI 3160.01A dated 12 October 2012, <https://info.publicintelligence.net/CJCS-CollateralDamage.pdf>, accessed 30 January 2022.

Throughout the month, early problems at Poggio involving CIS, ATO production, targeting and airborne C2 were systematically addressed. Intelligence was completely overhauled through the combined efforts of a deployable Theatre Intelligence Support Team from Ramstein and several ISR specialists from the AWC to provide better support to the targeting mechanism. Among other things, they established a formal ISRD. By the second half April, these measures were bearing fruit, and the Poggio facilities were assuming fully functional Air HQ and CAOC proportions.

During this period, force generation was a particular priority. The Americans continued to provide F-16CJs for SEAD, but otherwise contributed no combat assets except for a single line of Predator UAVs. To replace the aircraft withdrawn by the US, more RAF and French aircraft were allocated to the ground-attack role and there were additional contributions from Italy and Belgium. Efforts to secure more ISR assets were less successful. Historically, it has generally been considered that the strategic focus or chief priorities of an air campaign can most accurately be identified from the apportionment of offensive air assets. Yet increasingly, with precision-guided weapons, only a limited kinetic effect may be needed to attack the highest-value targets in campaign terms. Since the beginning of the precision era, a growing proportion of effort has been expended on the extensive preliminary ISR activity that the prosecution of these targets invariably requires. The prevailing shortage of collection platforms during Ellamy was therefore a serious handicap. Senior commanders had less intelligence at their disposal to support key decisions – including targeting decisions – than would typically have been forthcoming in Afghanistan, and were therefore compelled to accept significantly greater risks. Revised basing arrangements and the provision of more US tankers allowed available ISR assets to be more intensively employed, but this only provided a partial solution, at best.

Nevertheless, in Libya, the coalition fulfilled its primary mission. The air campaign inflicted heavy losses on regime forces and compelled them to assume an entirely defensive posture in the east. When they turned their attention west towards the rebel-held port of Misratah, air power played a key role in repelling their assault late in April and in early May. However, resource constraints prevented the coalition from providing much direct support to rebels in the far western region known as the Jebel Nafusah for the time being.

### **The Search for a Strategy**

Soon, extended deliberations began at Naples and Poggio, between the two headquarters and in national capitals over the more general direction of targeting. While it was obvious that many air strikes conducted as part of Operation Ellamy would take the form of reactive responses to imminent threats against civilians or rebel forces, these essentially dealt with the symptoms rather than the causes of the Libyan crisis. There was a strong case for arguing that greater effect could be

achieved more economically by influencing the regime's behaviour – so-called 'force on mind' – and it seemed more likely to be influenced by deliberate attacks on vital C2 nodes or military infrastructure in and around Tripoli than dynamic strikes elsewhere. One of the only examples of this approach during the early stages of the conflict occurred on 17-18 April in a UK-devised operation that successfully struck regime communications links between Tripoli and Brega, but it was very much the exception to the rule.

Early in May, conscious of the need to bring more pressure to bear on Gaddafi, COM CJTF asked for proposals on targeting higher C2 in Tripoli, and a pronounced shift in the orientation of coalition targeting subsequently occurred. A decline in the number of dynamic targets helped to free up some spare capacity for these missions as the month unfolded. The shift towards Tripoli was strongly supported by the UKACC and his staff in theatre and was entirely consistent with the British government's assertive posture on the Libyan crisis and the UK's leading role in the coalition – particularly since the withdrawal of US ground-attack aircraft – but a limited realignment of targeting approval procedures and delegations was necessary before it could be achieved. Nevertheless, by the second half of the month, RAF GR4s and Typhoons were in a position to lead a series of major strikes on regime targets in the Libyan capital.

Meanwhile, in a separate initiative, further UK proposals were submitted to the CJTF HQ comprising a fully developed set of targets, a carefully sequenced implementation schedule and proposals for integrated Information Operations (IO). However, while NATO aircraft ultimately struck the nominated targets, the proposed sequencing and IO elements of the plan were not implemented.

Despite the shift of focus towards Tripoli, there was no immediate breakthrough, and concern grew during May and June that the air campaign over Libya would prove difficult to sustain into the autumn; time was on Gaddafi's side. While air power had halted his armies on the eastern and central battle fronts, the coalition lacked a strategy that promised to bring the operation to a successful conclusion. Several options were considered but rejected either because they seemed unlikely to secure NAC approval or because they exceeded the parameters of the UN mandate.

Seeking a solution, the CFACC's Strategy Division laboured intensively to produce a centre-of-gravity analysis focussed on the Gaddafi regime's capacity to harm the Libyan population. This concluded that the coalition's target set extended only to a limited area of Gaddafi's true power base. A revised operational design was needed, in other words, a strategy that would deliver the required end state and guide the application of air power. Subsequently, the Strategy Division incorporated this concept into detailed proposals based on classic US four-line DIME (Diplomatic, Information, Military, Economic) principles. The first task was to establish a clearly defined end state for the campaign, which was defined as follows:

An enduring condition exists where the population of Libya is not under attack or threat of attack thereby meeting the conditions of UNSCR 1970 and 1973.

Similarly, it was suggested that the campaign's strategic and operational objectives might be refined to encompass the following goals:

Civilians and civilian-populated areas protected.

Belligerent Actors influenced to cease operations against civilians.

On this basis, a clear strategy could be formulated, which would be:

*A tightly focused coercive strategy applied synergistically across the DIME lines of operation, which protects the population by forcing an enduring change in the behaviour of Belligerent Actors (BA) in Libya.*

Its aims would be to:

- Protect the population from attack from BA.
- Deny BA the ability to attack.
- Isolate BA from mechanisms of power:
  - From support mechanisms.
  - Capital from Regions.
  - Within Region.

The strategy linked so-called 'decisive conditions' to objectives, tasks and targets within the component planning and joint planning processes. However, it also stressed that military operations had to be conducted in parallel and in coordination with extensive Strategic Communications (STRATCOM), IO and psychological warfare activity to stand any chance of exerting genuinely coercive effect. Beyond this, clear and quantifiable measures of campaign progress were suggested, and there was a detailed strategy-to-task breakdown. As far as the future direction of the air campaign was concerned, particular importance was attached to the sequenced targeting of regime command, control and communications infrastructure to isolate Gaddafi and his subordinates from the key instruments of power.



**Air Chief Marshal Sir Stuart Peach. Chief of Joint Operations in 2011, Peach faced the challenging task of commanding Operation Ellamy and Operation Herrick in parallel.**



Air Commodore Edward Stringer (right), UKACC for Operation Ellamy from March to June 2011.



A Royal Air Force Typhoon taking off from Gioia del Colle for a mission over Libya in April 2011.



The CAOC at Poggio during Operation Ellamy.



Air Commodore Gary Waterfall (left), UKACC for Operation Ellamy from June to October 2011, with other RAF officers at the Poggio CAOC.



A Royal Air Force E-3D taking to the air at Trapani for another Operation Ellamy mission in June 2011.



Airborne command and control: the scene onboard an E-3D during an Operation Ellamy mission in June 2011.

The CFACC afterwards sought as far as possible to implement the main air proposals contained in the strategic plan, and the analysis behind these proposals was drawn on by the relevant staffs in the CAOC to inform targeting and ISR to support targeting. Intelligence provisions were adapted to provide the necessary support, and coalition aircraft in due course attacked many of the recommended targets and target sets. And yet these new initiatives were rarely, if ever, accompanied by appropriate parallel activity at CJTF HQ level. Whereas the Air HQ stressed the importance of effects-based targeting and the force-on-mind approach, these concepts were not firmly established in NATO air targeting doctrine in 2011. Instead, there was a preference for maximum kinetic effect and for hitting targets as and when they became available. One notable manifestation of this problem was the absence of regular JTCB meetings at the CJTF HQ for much of the campaign. In 2011, NATO operations doctrine described the JTCB as ‘the JFC’s principal meeting’; it was an elementary campaign management tool. And yet, for three months, JTCBs were rarely convened. A shift towards more systematic targeting and regular JTCB meetings only occurred at Naples during the later months of Ellamy.<sup>122</sup>

Meanwhile, the search for a new strategy also led to an Anglo-French initiative to deploy Attack Helicopters (AH), which were to operate afloat. In the absence of other clear means to break the stalemate in Libya, there were genuine expectations that the deployment of AH – aligned with a strident media campaign – could exert a decisive impact, although these were by no means universally shared. At Poggio, the CFACC and several of the SNRs feared that the effect of the deployment was being overestimated in both London and Paris, and that it would divert senior command and staff effort and other scarce resources such as ISR and SEAD, which were of critical importance to broader air operations over Libya. These would prove to be very well founded.

Command of the six UK AH was retained by the UK except for the duration of each mission, when tactical command was to be transferred to NATO. Both the UK and France placed AH experts in the CAOC to provide the necessary expertise to plan and co-ordinate operations as part of the overall air campaign – in theory at least. However, the French also created an entirely separate embarked planning staff consisting of 40 personnel with a more nationalistic agenda. Protracted negotiations between the responsible French and coalition executives failed to produce a compromise. Effectively, the employment of France’s AH force would be directed from Paris; the French would choose their own target areas and strike days and use a five-day planning cycle guided by their own

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122. According to NATO doctrine, the Joint Targeting Coordination Board is established by the Joint Force Commander (JFC). Typically, it reviews target information and develops targeting guidance and priorities while preparing and refining joint target lists for recommendation to the JFC. It is the primary agency for synchronising and managing joint targeting efforts. See AJP-3.9, *Allied Joint Doctrine for Joint Targeting*, Edition A, Version 1, April 2016, Chapter 4, Section V.

targeting intelligence. TEA remained firmly in French hands and was based on a French interpretation of ROE and CDE. The CAOC was left to deconflict as best it could with what was virtually a discreet national operation staged in the coalition's operational airspace.

No less problematic was the vulnerability of AH. Given the media attention that surrounded the AH deployment, the loss of a single asset would have handed a significant propaganda victory to Gaddafi. The dangers were highlighted on 18 June when a British Apache was nearly shot down by a MANPAD. Thereafter, the new UKACC, Air Commodore (later Air Vice-Marshal) Gary Waterfall, had to weigh the balance of resources, risks and potential operational rewards with extreme care before Apache missions were sanctioned. In the end, while a total of 44 missions were planned, only 22 were executed.

### **The July-August Surge and Gaddafi's Downfall**

Ultimately, the most decisive strategic initiative was devised by France and the UK in close collaboration with Arab coalition members and the Libyan rebel leadership and was designed to exploit improved C2 and communications among the rebel forces (by then commonly known as the Free Libya Forces (FLF)). Launched early in July after a series of important rebel gains in the Jebel Nafusah (where the FLF had been receiving extensive support from France, the UAE and Qatar), it was based on the concept of coordinated parallel operations. These included FLF offensives supported by coalition air power in areas like Brega and Misratah, and a further UK targeting and IO plan designed to encourage upheaval and insurrection in Tripoli. This was referred to as 'Full-Spectrum Targeting'.<sup>123</sup> The aim of combining these operations was to stretch regime resources to the limit before a *coup de grace* was administered by a rebel offensive from the Jebel Nafusah.

The obvious question was whether the coalition could muster enough resources to sustain such a broad approach. In preparation for this intensified period of operations, certain changes were implemented to the UK Air Component. First, all deployed aircraft were incorporated back into one EAW numbered 906 under a single commander, leaving the Deputy ACC and other staff at Poggio free to focus on their core mission roles. Second, four more Tornado GR4s were deployed forward and four others were placed at readiness to mount Storm Shadow missions from the UK.

The first of the coalition's four operational stages involved an offensive by rebel forces towards Brega, in the east. Despite the commitment of air support on a substantial scale, including ISR cover that was urgently required further west, they were soon halted. Full-spectrum targeting was then initiated. Although the

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123. On Full-Spectrum Targeting see AJP-3.9, Allied Joint Doctrine for Joint Targeting, Chapter 1, Section V.

CJTF HQ had embraced the principles behind the concept, it proved necessary to narrow the targeting focus towards regime C2, which had largely been dispersed for its own protection by this stage of the conflict. Some of the new C2 facilities proved difficult to locate, but a list of appropriate targets was prepared in due course.

Full-Spectrum Targeting was originally divided between four phases – preparation, shaping, strike and exploitation. The shaping and strike phases were to be accompanied by IO such as leaflet dropping, radio broadcasts, and other supporting operations by a variety of coalition aircraft. However, in the middle of July, the plan was revised as it became clear that no rebel offensive in the Jebel Nafusah was imminent. Furthermore, collaborative measures instigated with France and the Arab coalition members in the meantime provided greater clarity of the ground situation between Misratah and Zlitan, east of Tripoli, and suggested that the FLF might soon achieve a breakthrough in this area. Via the same channels, there was also a marked upsurge in the volume of reliable target intelligence from the Zlitan front, which was used to augment intelligence derived from other agencies and airborne ISR. The coalition originally intended to strike these targets dynamically, but they all involved buildings, and the accompanying collateral damage estimates made dynamic attacks virtually impossible to prosecute. After much consideration, it was therefore decided to develop a new targeting and boarding process to treat targets as deliberate but then strike them dynamically within the ATO cycle. Dynamic-Deliberate Targeting was born.<sup>124</sup>

And so it was that the shaping phase of the operation became largely focused on the Misratah to Zlitan front with the aim of employing air power to clear a path for a rebel advance. A breakthrough would have directly threatened Tripoli from the east, preventing any concentration of regime forces south of the capital to confront the projected FLF offensive from the Jebel Nafusah. The key role of Dynamic-Deliberate Targeting is illustrated by the fact that the NATO clearance process had at best produced an average of around seven deliberate targets per week during June. From 18 July, in a single morning, it was possible to clear twice this number for attack in the in just 24 hours. Dynamic-Deliberate Targeting resulted in a three-fold increase in the RAF's monthly strike rate against deliberate targets including C2 nodes, defensive positions, fielded forces, ordnance depots and fuel storage sites. In terms of both accuracy and effect, coalition air strikes in this period were particularly successful.

Nevertheless, on the ground, the FLF were confronted by Gaddafi's 32nd Brigade – probably the best trained and equipped formation in the Libyan army

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124. Dynamic-Deliberate Targeting is now more commonly referred to as Deliberate On-Call. See US Joint Publication 3-60, *Joint Targeting*, Chapter II, p. 2. 'On call targets have actions planned, but not for a specific delivery time. The commander expects to locate these targets in sufficient time to execute planned actions. These targets are unique in that actions are planned against them using deliberate targeting but execution will normally be conducted using dynamic targeting.'

– and their progress was inevitably slow. A significant degree of tension now began to develop between the various concurrent operations. Aircraft were frequently reapportioned between Brega, Zlitan and Tripoli, the stalled Brega offensive imposing a particularly severe drain on resources. The pressure of competing commitments became still more acute when certain countries were compelled to withdraw aircraft from the coalition on sustainability grounds.

The majority of full-spectrum strike phase missions were not flown until 25-27 July. All the targets were destroyed, but the impact of full-spectrum targeting proved extremely difficult to gauge. It was the delayed FLF offensive in the Jebel Nafusah, launched immediately afterwards, that finally ended the stalemate. On 6 August, the rebels captured the town of Bir Al Ghanam, only 80 km from Tripoli, opening one of the major roads north out of the mountains and towards the coast.

With the FLF advancing far more rapidly in the Jebel Nafusah than on the other fronts, it is in some ways surprising to discover that the Zlitan and Brega offensives continued to receive the lion's share of kinetic air support in this period and that there was only a limited change of apportionment thereafter. How can this be explained? First, it is important to note that coalition ISR *did* maintain a close watch over the Jebel. Second, it must be remembered that many of the strikes in the Zlitan area were Dynamic-Deliberate rather than merely dynamic; in other words, they resulted from specific intelligence leads that were not forthcoming in other areas. Third, when targets did emerge in the Jebel, it was often at short notice, necessitating perhaps only a single attack, whereas the regime forces around Zlitan and Brega were deployed in prepared defensive positions that had to be written down over time by multiple missions.

It might possibly be argued that more combat aircraft should have been allocated to *dynamic* targeting over the Jebel Nafusah, but the surviving records do not suggest that this would have resulted in many more attacks on regime forces. So rapid was the FLF advance that aircrew were soon struggling to determine the allegiance of such ground units as they observed, and it became virtually impossible to establish an RFL. Combat aircraft formally assigned to Tripoli and Zlitan could usually be reallocated to the Jebel if the need arose, and the same was true where ISR assets were concerned.

By 19 August, rebel forces were converging on Tripoli from west and east. At this stage, the coalition launched a second full-spectrum operation designed to complement the first. The RAF contribution involved strikes on eight deliberate targets in the Libyan capital, including C2 centres for Libyan intelligence, the internal security forces and Gaddafi's revolutionary committees. This targeting continued the following day. On the 21st, a mass insurrection began, and the first rebel troops arrived soon afterwards.

Initial coalition assessments of the situation were predictably upbeat, and Gaddafi's apparently imminent overthrow led to the cancellation of all planned kinetic air activity that day. Aircraft were restricted to patrolling and maintaining

presence. Yet within 24 hours, the euphoric mood in the CJTF HQ and the CAOC engendered by the events in Tripoli was subsiding. Kinetic strikes resumed on the 22nd, although there was much uncertainty about the situation on the ground. Targeting opportunities were both limited and complex due to the presence of rebel troops, civilians and foreign media reporters, and the clearance of Tripoli ultimately involved a drawn-out and laborious process whereby rebel troops repeatedly advanced and then halted again, while the coalition arranged air support to deal with particularly tough pockets of resistance. The last and most significant, located in a compound south of the city, was under the command of Gaddafi's son Khamis. After it was repeatedly targeted from the air on the 26th, the rebels moved forward once more and the compound was overrun within a few hours, ending organised regime resistance in the Libyan capital.

The remaining regime forces then withdrew into central Libya and established their main presence in Bani Walid and Sirte, in the north, and Sebha in the south. With Gaddafi overthrown, it was all too easy to conclude that Operation Ellamy was virtually over, but the view in the CAOC was that hostilities were likely to endure for some time. During the first week of September, there was nevertheless some reduction in the intensity of operations while the rebel leadership sought unsuccessfully to persuade pro-Gaddafi forces in Sirte to surrender.

Subsequently, efforts to subdue such areas as remained in the hands of regime forces stretched coalition resources to the limit, and commanders were often compelled to improvise to make the best possible use of available air assets. During this period, the RAF employed Tornado GR4s in the NTISR role to supplement the coalition's conventional ISR platforms, flew long-range missions beyond the normal personnel recovery limits and launched Storm Shadow against distant targets in the south even though they were not hardened. 'Legacy' unmodified Brimstone missiles were used for the first time to help conserve dwindling DMSB stocks. The familiar issue of centralised versus decentralised command and control reappeared at this stage, as some of these tactical-level initiatives required ministerial approval.

By the last week of September, Sebha had fallen, and regime forces in Bani Walid no longer posed a threat. The coalition focus therefore turned to Sirte, where a rebel ground offensive was keenly anticipated. However, any hopes that Sirte might be swiftly subjugated were soon dashed, for the target set in the city was particularly difficult to discern. There were few defined military facilities, and it was therefore necessary to classify civilian areas as military by function in order to meet the established targeting criteria – something that often required more intelligence than was forthcoming. As always, target identification was hampered by the dynamic nature of the conflict.

Ultimately, the supply of intelligence improved, and Sirte was subjected to continuous air attack in late September and early October. Rebel forces approached the city from east and west, finally linking up on 4 October to split

Gaddafi's remaining troops into northern and southern pockets. The main rebel effort was then directed towards the southern pocket, but progress was again slow and faltering. Regime troops used the civilian population as human shields, positioning their rocket launchers in civilian areas and so limiting the scope for their adversaries to employ heavy weapons or air power.

This occurred at a time of increasing concern in the coalition that the closing stages of the conflict might witness a major civilian casualty incident. Eventually, at the beginning of October, the COM CJTF imposed a blanket prohibition on all deliberate targets, including some previously cleared, which could only be lifted by him personally on the basis of proven urgency and compelling intelligence. Unfortunately, the potential for dynamic targeting was simultaneously reduced by several days of poor weather, which not only limited flying over Libya but also grounded the all-important Predators at their bases. The coalition had to fall back on using MPA to provide reconnaissance support to the fast jets. After a period in which the majority of attacks employed dynamic targeting, the RAF's GR4s mounted only two such strikes between 25 September and 3 October.

By the 9th, regime resistance in south-east Sirte had been overwhelmed and fighting moved into residential areas further north. Air missions on a much-reduced scale now primarily took the form of armed over-watch, as the rebels edged forward. On the 14th, the COM CJTF decreed that an organised military threat to civilians in Libya no longer existed. On this basis, he revoked all previously issued delegations of authority for the use of force, making himself the sole authority for any further air strikes. After more intense fighting on the ground, Gaddafi's capture and execution on 20 October effectively brought the conflict to an end. The final RAF sorties were flown on the 31st.

## **Tactical Air C2**

On 26 February 2011, two E-3Ds deployed from RAF Waddington to RAF Akrotiri to provide airborne early warning, command, control and communication in support of the C-130 NEO entitled Deference – the recovery of British subjects from Libya following the outbreak of the civil war. Within 24 hours, three aircraft and four crews from 8 Squadron were based at Akrotiri. Their task was to control the C-130s conducting the evacuation and provide communications relay and airborne early warning over Libyan airspace while remaining over international waters. They flew a total of six Operation Deference sorties for 50 hours during February, controlling twelve aircraft that evacuated 193 people.

The three E-3Ds and associated support personnel then remained at Akrotiri and continued to provide surveillance of the Joint Operational Area (JOA), maintaining a single daylight orbit while 101 Squadron VC-10s provided AAR support. From 10 March onwards, they began sharing responsibility for

surveillance and intelligence gathering with a French E-3F component based at Avord. The E-3Ds maintained two daily lines, while the E-3Fs maintained one. The JFACC tasked them to build a Recognised Air Picture of the JOA with an emphasis on identifying and tracking any Libyan regime aircraft attacking the civilian population.

The E-3Ds mounted 17 Operation Deference sorties in March. Then, on the 18th, Deference made way for the US-led Operation Odyssey Dawn and the initiation of the UK Operation Ellamy, following the passage of UNSCR 1973 and the launch of coalition air strikes on Libya. At this point, 8 Squadron's task was reduced to a single 24-hour line shared with NATO E-3As, French E-3Fs, and USAF E-3Cs. They were required to police the no-fly zone over Libya, enable the delivery of humanitarian aid and control approved non-NATO flight activity. However, their primary task was to provide airborne C2 for the multitude of aircraft operating over the Mediterranean and Libya, controlling air strikes, deconflicting air assets, maximising tanker availability and coordinating ISR collection and dissemination.

On 21 March, the E-3Ds, Sentinels and VC-10s were amalgamated into 907 EAW along with a single Nimrod R1. There were two particularly notable demonstrations of their capability at this early stage. The first involved the urgent relay of an abort order to RAF GR4s, preventing a Stormshadow launch against a site being inspected by western journalists. The second was a midnight scramble and the subsequent provision of airborne C2 during the recovery of an F-15 pilot, who had ejected over Libya after his aircraft developed technical problems. Once NATO assumed leadership of the operation at the end of March, E-3D basing arrangements were revised, and two aircraft moved to Trapani, Sicily, where a detachment from NATO's multinational E-3A force had been positioned; the third returned to the UK to serve as a training aircraft. The redeployment was executed within a single ATO cycle during which the E-3Ds maintained full airborne C2 and surveillance coverage.

The geographical advantages of the move to Trapani require little explanation. By operating from a base considerably closer to Libya, on-station periods could be extended without the requirement for AAR, making more fuel available for other assets – particularly the fast jets. Shorter transit times also provided greater flexibility, including the extension of on-task periods or the rapid relief and replacement of aircraft with unserviceabilities. Moreover, accommodation alongside the NATO detachment allowed for more timely and efficient exchange of intelligence on the ground. Yet co-location proved rather less satisfactory in other respects. Trapani lacked sufficient dedicated technical facilities, and there was a delay of nearly three months before NATO released funding to provide an adequate solution. Furthermore, the base struggled to accommodate the deployed equipment and personnel required to fulfil the logistical demands of the NATO and RAF detachments.

The difficulties involved in establishing coalition command and control have already been described. Not surprisingly, there were also many challenges at the tactical level. The initial lack of C2 infrastructure at Poggio had especially pronounced implications for airborne C2. Moreover, the CAOC sometimes seemed unaware of E-3D capabilities and unwilling to delegate functions to the onboard Tactical Directors, particularly where AAR was concerned. Supervision of, and responsiveness to airborne C2 assets sometimes seemed to be lacking. Valid targets were periodically identified, using the approved criteria, only for them to be declined at CAOC level or subjected to such extended scrutiny that the available combat air assets reached ‘bingo’ fuel state and were compelled to withdraw. Yet the airborne C2 detachments were themselves the subject of periodic criticism, and the Libya commitment imposed a particularly severe strain on the NATO E-3A force, which was also operating over Afghanistan. Doubts regarding the standard of airborne C2 in turn fuelled concerns about flight safety. In several instances, different coalition air formations were cleared to enter the same airspace at the same altitude.

The operation also exposed equipment deficiencies that exerted a considerable impact. Some airborne C2 assets lacked secure communications. The E-3Ds themselves lacked secure satellite communications during Operation Deference but obtained the Mission Data Exchange System in March, and NATO’s J-Chat facility became available during the later stages of Ellamy. A secure chat capability was later characterised as the mainstay of secure tactical C2.

No less significant was the fact that the E-3D had no Defensive Aid Suite in 2011. The air threat was initially assessed as ‘substantial’ over areas of Libya controlled by the regime, ‘moderate’ over rebel-held areas and ‘low’ over the sea. The first E-3D orbit areas (for Operation Deference), dictated by AWC advice on SA-5 capability, were established off the Libyan coast. However, following a reassessment, the orbit areas were moved further north, and they were not moved back again until all known Libyan SA-5 systems had been suppressed. In the later stages of the operation, the air threat was reduced from ‘moderate’ to ‘low’, allowing the E-3 orbits to be pushed south over land to provide sensor and communications coverage for combat and reconnaissance aircraft flying as far south as Sebha. At all times, E-3Ds operating over land maintained a minimum altitude of 29,000 ft.

The pace of the operation accelerated markedly during April. In a single week – 22-28 April – the E-3Ds controlled 197 combat aircraft, 101 refuelling aircraft, 50 AEW and ISR platforms, and 11 humanitarian flights. They also managed strikes on some 25 dynamic targets and identified 18 maritime contacts of interest. The maritime surveillance task expanded as the operation progressed, traffic being monitored via the Automatic Identification System (AIS) – an automatic tracking system used on ships and by vessel traffic services for identifying and locating vessels by electronically exchanging data with other

nearby ships and AIS stations. At the very end of the month, a confident poor-weather prediction led to the repositioning of one E-3D to Aktion airfield, near the Greek town of Preveza, so that a mission that would have been cancelled at Trapani could be flown according to plan.

Operations in May established the basic pattern for the E-3Ds until August. Working alongside the E-3As, the RAF crews, support staff and engineers maintained a steady battle rhythm, flying a busy day line with one hour's standby commitment, and maintaining 100 per cent of tasked on-station time. The E-3D Tactical Directors noted an approximately even split between pre-planned and dynamic targets, with the weapons teams typically controlling 30 fighters, 20 tankers and five AEW and ISR aircraft per sortie.

US E-8 JSTARS often retained control of kinetic strikes over land, leaving the E-3Ds with a greater focus on dynamic AAR re-tasking. In an operation that was particularly dependent on AAR, management of the tankers proved especially challenging even after the CAOC appointed a dedicated tanker plans team. On 3 June, one of the VC-10s flew a five-hour sortie from Akrotiri without offloading any fuel.

An enduring threat from Libyan Air Force aircraft based at Mitiga airfield made DCA cover essential for any tankers routed into the area. The absence of DCA in such circumstances thus had the potential to halt tanker missions, impacting on receivers such as OCA or reconnaissance aircraft. The tanker tracks, the threat and the corresponding requirement for DCA created a situation in which constant vigilance and careful management was required from airborne C2 aircraft. If refuelling requirements seemed likely to bring unescorted tankers close to Mitiga, the CAOC had to be alerted immediately. While there was sometimes scope for re-tasking OCA assets equipped with beyond-visual-range missiles to protect AAR assets, they were by no means always available.

Unserviceabilities across several aircraft fleets generated further challenges that required considerable flexibility from the E-3D force. Both the NATO E-3As and US E-3Cs were affected, requiring the E-3Ds to extend their planned time on task on several occasions. On 10 June, after the on-task E-3F became unserviceable, it was necessary for an E-3D to launch early and execute a particularly busy mission, coordinating a refuelling offload of 1.1 million lb. On another occasion, three tankers were compelled to abort their missions while an E-3D was on task, but the crew's rapid response ensured that only a single pair of receivers had to return to base because AAR was unavailable.

Deconfliction issues arose throughout Operation Ellamy and underlined the vital importance of effective airborne C2. Early reports from the E-3D detachment refer to unscheduled or unannounced appearances by aircraft that were not on the ATO, which were duly reported to the CAOC, and both air and maritime assets regularly entered the JOA without checking in with C2 aircraft, causing at least one airprox incident. On another occasion, the Maritime Component initiated firing exercises without first clearing the affected airspace.

The on-task E-3D was obliged to halt the exercises, and they did not resume until all potentially vulnerable aircraft had been diverted.

The E-3Ds continued to mount one sortie per day between May and October (inclusive). Through regular recourse to AAR, they typically flew around 280 hours per month, the duration of each mission averaging 9 hours, including nearly 7 hours on task. During June and July, they flew in the middle hours of the day – the busiest period of the ATO, involving more dynamic re-tasking and targeting than other E-3 slots. From May to July, the E-3Ds controlled around 1,300 formations per month and managed an AAR offload of 18.7 million pounds per month. Over this period, they controlled strikes on an average of 95 dynamic targets per month.

However, at the end of July, the Trapani detachment began operating at night. This coincided with the issue of an Urgent Technical Instruction, which effectively halted E-3D AAR for a month. In this period, they continued to fly one daily sortie, but average sortie duration was reduced to 8.1 hours and average time on task to 6 hours. These figures show how AAR helped to maximise airborne C2 coverage earlier in the campaign and illustrate the loss of coverage that resulted from its absence. Nevertheless, reduced AAR tasking in August (an offload of 11.4 million pounds) and clearance to operate nearer the Libyan coast left the E-3Ds with ample scope to support the offensive effort. Although, in that month, they controlled only 794 formations in total, they controlled strikes on no fewer than 203 dynamic targets, an average of 6.5 per day and twice the monthly number recorded from May to July.

The established operating patterns were substantially restored in September. By then, following the fall of Tripoli, the number of air strikes was steadily declining, but there was considerably more opportunity to provide humanitarian relief. The number of humanitarian flights controlled by the E-3Ds increased from 99 in August to 655 in September and 993 in October.

The key lessons identified by 8 Squadron after Operation Unified Protector had less to do with the exercise of airborne C2 than with the multiple enabling factors that allowed effective C2 to be delivered. When the operation began, the E-3D force was undermanned in several key areas, but support from 54(R) Squadron OCU<sup>125</sup> and STANEVAL<sup>126</sup> staff had produced a short-term solution. Air transport between the UK and Trapani had provided sufficiently reliable logistical support to allow high flying rates to be maintained by just two deployed aircraft, and AAR had played a critically important part in maximising their time on station. Recommendations for the future focused on the need to address manning shortfalls, invest in GSE, and maintain AAR training. More broadly, 8 Squadron suggested that solutions to particular problems in theatre, extending through personnel, logistics, communications and finance, had taken too long to

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<sup>125</sup> OCU – Operational Conversion Unit.

<sup>126</sup> STANEVAL – Standards Evaluation.

secure through the approved ‘bottom-up’ procedures and would have benefited from greater latitude for command-led provision. Furthermore, given the difficulties encountered in maintaining effective airborne C2 across several coalition fleets, there was a need for E-3D personnel to gain routine access to quality and high-intensity training (live and synthetic) in a multi-national context.

## Conclusion

As air C2 proved so challenging for NATO in the Kosovo campaign and in Afghanistan, further difficulties were always likely during Operation Ellamy. Inevitably, perhaps, there were short-term problems that resulted from the fact that the operation was launched at virtually no notice: there was minimal time for planning and preparation, and the CAOC was literally created from scratch. It is hardly surprising that some teething troubles occurred, but they were soon largely overcome.

Far more problematic was the relationship between the combined Air HQ/CAOC and the CJTF HQ. As in Kosovo and Afghanistan, the command and control of extended and large-scale air operations was successfully maintained under NATO auspices, but the campaign suffered from a lack of higher-level direction. For some time, the CJTF HQ failed to provide clear guidance, overlooked the importance of regular JTCB meetings and employed an *ad hoc* approach to targeting in preference to the carefully sequenced packages favoured by the CFACC and his staff. Ultimately, the Air HQ assumed the task of producing an operation plan that extended far beyond normal air boundaries. It helped to guide subsequent air operations but was never formally accepted or implemented at the CJTF HQ level.

In standing up the CJTF HQ, NATO was bound by procedures that dictated the appointment of the alliance’s Joint Force Command staff to key operations posts, whatever their service background or experience. In the context of Ellamy – overwhelmingly an air operation – it would have been better to recognise that such positions required knowledge, skills and qualifications that only experienced air force officers were certain to possess. The situation did not improve until the later stages of the campaign, when the CJTF HQ staff began to employ a more methodical approach to air targeting. Given the absence of a coherent strategy for Ellamy, it is hardly surprising that the operation witnessed a series of interventions from beyond the formal NATO command chain. These included several UK targeting initiatives, French and Arab support for rebel forces in the Jebel Nafusah, the Anglo-French AH deployment and, ultimately, the strategy of ‘simultaneity’ that brought Ellamy to a successful conclusion.

The RAF played a key role in air C2 at the Air HQ/CAOC level, exerting considerable influence. This reflected the scale of the UK air contribution, the training and experience of RAF personnel, their appointment to pivotal positions in such areas as strategy and intelligence, historically close ties with the USAF

and membership of the 5-Eyes community. Among other things, RAF officers helped to establish the new headquarters facilities, and they were substantially responsible for producing the CFACC's strategic plan in May and introducing Dynamic-Deliberate Targeting later on. The value of the JFACHQ was also underlined in the early stages of Ellamy, and the E-3Ds exercised the critically important airborne C2 function throughout the operation and during the earlier NEO, Operation Deference.

Nevertheless, the long-standing tension between centralised and decentralised C2 re-emerged when, on occasion, UKACCs ran out of delegated or timely authority from PJHQ or the MOD, and a number of important issues were also identified in post-operation lessons studies. Operational security gave cause for concern, the supply of intelligence specialists, certain other C2 staff and trained E-3D crews was stretched close to the limit, and the RAF's deployable CIS infrastructure was again found wanting. In some respects, the strain was made more acute by the parallel commitment of resources to Operation Herrick. Most of all, the RAF was placed at a disadvantage because of its limited representation in NATO. While this was understandable, given the demands imposed by Iraq and Afghanistan throughout the preceding decade, the experience of Ellamy nevertheless suggested that a better balance between NATO and non-NATO commitments was essential.

## **GENERAL CONCLUSION**

This study set out to examine the more recent history of RAF air C2, drawing on six operations conducted over four decades in highly diverse circumstances. Since the end of Herrick, the RAF has been committed to further operations in Iraq and Syria, which have generated air C2 challenges of their own. The simple fact is that, as warfare develops, air C2 must evolve as well. The last word on this subject can never truly be written.

Yet this account does succeed in bringing the RAF's C2 history more up to date. Hitherto, students of the subject have been confined to a historiography that barely extended beyond 1945. To a great extent, it focused on personalities – on the most prominent early commanders such as Trenchard, Portal, Dowding, Tedder, Park, Harris and Coningham. The history of RAF C2 architecture and processes was heavily biased towards air defence and particularly the so-called 'Dowding System' employed during the Battle of Britain. There was an obvious need for a more modern perspective.

The basic narrative contained within these pages was underpinned by continuous doctrinal change as the strategic and military environment was transformed following the end of the Cold War. Publications went through multiple editions as their authors sought to reflect on the latest developments, but it was difficult to keep up. Sometimes there was a reluctance to challenge established principles called into question by recent experience. It was also hard to distinguish fundamental long-term change from the short-term but defining characteristics of particular conflicts.

Over the period covered in this history, air C2 doctrine had to incorporate the shift away from Cold War military postures and towards OOA expeditionary or deployed operations, the emergence of the Air Component, the expanding use of precision-guided weapons, NEC, air power cast in both lead and supporting roles, operations against regular and irregular adversaries, deliberate and dynamic targeting and much else besides. Throughout, the principle of centralised command and control and decentralised execution was the most prevalent long-term air C2 theme, and the arguments in favour of this approach remain particularly strong owing to the importance of prioritisation and the difficulties involved in transferring organic or similarly allocated air assets from one task to another. Although, for a time, UK air doctrine embraced a limited departure from centralised air C2 in certain circumstances via 'adaptive' air command, this has not proved to be an enduring concept.

Air C2 proved unsatisfactory in the first of the case studies featured here, Operation Corporate, in the UK, at Ascension Island and in the South Atlantic. The critical role of air power in modern conflict would not have been seriously contested by any senior British officer from the Royal Navy, the Army or the RAF in 1982, yet the exclusion of HQSTC from the Corporate command chain was hardly likely to facilitate the provision of air support to the TF. Equally

inexplicable was the decision to place the UK's single forward base commander outside the formal TF chain. Within the TF itself, there was no effective means of providing C2 for offensive or reconnaissance air missions, and tactical air power was not very effectively exploited. More generally, UK C2 arrangements were characterised by over-centralisation and disunity, the absence of a Joint Force Commander in theatre being a particular handicap.

However, the most important lessons were learnt, accelerating the development of new C2 arrangements based on FLC HQs functioning as JHQs and the forward deployment of JFHQs. This was the system employed during Operation Granby in 1990-91, and it represented a substantial improvement from the air perspective and more broadly. Indeed, relatively straightforward and efficient C2 structures were established to serve both coalition and national purposes, although there was still some tension between the main UK headquarters and the MOD, which found itself playing a far more limited role than in the Falklands War.

By contrast, Allied Force can only be considered a backward step, involving, as it did, high-level political and military interference on a scale unparalleled in recent history. The CFACC's task was further complicated by deficient planning machinery that took time to improve, and by the sheer tempo and dynamism of the operation, which stretched existing battle-management and campaign assessment capabilities to the limit, if not beyond.

Telic was far simpler from the C2 perspective given the narrow base of the coalition and the dominant role of the US and the UK within it. Moreover, the C2 machinery substantially duplicated structures employed and proved during Granby. The key difference compared with Granby was a coalition strategy that gave pride of place to the Land Component and cast air power in a supporting role. This development was accompanied by a further pronounced shift in the direction of dynamic air-to-ground targeting, with all the challenges involved. It was this aspect of Operation Telic that bequeathed the most lessons afterwards, but the general perception of coalition air C2 was still broadly positive.

The same cannot be said where Operation Herrick was concerned. In Herrick, air C2 was severely handicapped by a complex and inefficient dual structure in which overriding authority was ultimately exercised by a headquarters far from Afghanistan. Effective integration of NATO and US air C2 was rejected by NATO for too long, even though the US contributed the vast majority of air assets available for tasking across the Afghan theatre. It was first proposed – by the RAF – in 2006 but not finally agreed until the end of 2011, when the American ACCE also became ISAF's DCOS Air. In the meantime, without significant USAF influence inside HQ ISAF, senior CAOC staff remained distrustful of ISAF's competence and reluctant to delegate C2. The exploitation of air power also suffered from a chronic lack of clear guidance and – until the final years of the campaign – an absence of integrated air and land planning. Combat air platforms were largely employed on a reactive basis with

increased insurgent leadership targeting representing the only significant shift towards pre-planned tasking from 2010 onwards. The general perception among airmen was that air power could and should have been utilised more effectively.

To an extent, this was also true of Operation Ellamy. NATO's C2 structure was certainly more rational, and the Air HQ/CAOC developed efficient and effective capabilities during the first two months of the campaign. Yet there were significant weaknesses at the CJTF HQ so that, once again, higher-level direction left much to be desired. Although there was a marked improvement during the later stages of the operation, the strategy that defeated Gaddafi was devised elsewhere.

A number of themes run almost continuously through these pages – from Corporate to Ellamy. The majority will already be clear, but it would be wrong to conclude without highlighting the more prominent. The first and perhaps most obvious is the extremely challenging nature of air C2. It is important to appreciate the difficulties involved, which are underlined by the absence of linear improvement from one operation to the next. Air C2 lessons have invariably been identified after the cessation of hostilities, but this has not necessarily prevented problems from arising subsequently.

Many factors influenced the effectiveness and efficiency of air C2, and some were inevitably beyond the RAF's control, especially in complex joint and coalition environments. Nevertheless, the RAF benefited from recognising that air C2 is a specialisation in itself, which demands appropriate training and education and other forms of organisational learning, such as national and coalition exercises, war games and staff rides; this is true at both the operational and tactical levels. The near-continuous accumulation of experience during nearly three decades of operations alongside the Americans also helped to generate levels of C2 expertise that few other air forces could match. Yet recurring shortages of particular specialists, such as targeteers and intelligence analysts, suggested that the training regime sometimes failed to address operational need adequately, and the E-3D force was also undermanned in key areas by 2011.

It is equally important to invest in C2 infrastructure, especially deployable CIS, the standard of which attracted adverse comment after most of the operations covered in this study. In Corporate, the RAF's Tactical Communications Wing only coped with the operational burden by using redundant long-range equipment held in storage since the decolonisation era. In Granby, the Joint Commander's report highlighted 'the deficiencies and weaknesses in CIS in our OOA capability'. The Kosovo Air Lessons report defined communications as 'a weak point' and the Telic report complained of the weakness of deployed communications and CIS throughout the operation. If anything, reports on Ellamy sounded an even more strident warning. Funding and resource constraints over many years undoubtedly contributed to this unsatisfactory situation, but it also seems possible that the importance of CIS was inadequately grasped by the

defence community. Consequently, the risks involved in ignoring deficiencies identified by post-operation lessons studies were also poorly understood. They only became clear when further operations were launched.

The necessity for investment inevitably extended into the sphere of tactical air C2. At this level, investment meant drawing on the lessons of Kosovo and other operations over the former Yugoslavia to adapt what was primarily a Cold War airborne warning platform into a more capable C2 asset and then reaping the benefits over western Iraq in 2003. It was also necessary to provide better communications for the E-3D during Ellamy to maintain interoperability with other coalition C2 aircraft. Again, however, it might have been better if such enhancements had been applied as part of a planned peacetime upgrade and not via a last-minute scramble to fulfil a UOR.

The third recurring factor was the need for flexibility in the application of C2 doctrine. Doctrine provides guidance but not a fixed solution that must necessarily be applied in all circumstances. Some variation from doctrinal purity should never be ruled out on principle. There are many possible illustrations, but the most obvious is provided by the institution of the JFHQ – subsequently the NCHQ. After Corporate, UK operational doctrine pre-supposed the deployment of a forward joint headquarters but, ultimately, the requirement for such a headquarters varied considerably over time. This was chiefly because UK doctrine was primarily devised for national operations, whereas all the major conflicts of the post-Cold War era involved coalitions. In three of the coalition operations considered here – Allied Force, Herrick and Ellamy – UKACCs worked directly back to PJHQ. Equally, while consecutive doctrinal publications presupposed that UK air commanders would exercise conventional C2 functions over their forces, coalition operations under US leadership required a very different approach. UK air commanders repeatedly served as SNRs or red card holders and worked in an advisory and consultative capacity under the CFACC. RAF officers only exerted greater influence at the Air HQ/CAOC level in Ellamy because of the reduced scale of US participation and the UK's leading role in providing combat aircraft and intelligence.

This is not to say that doctrine or past lessons are unimportant. Indeed, doctrine exists for a reason, and considerable risks are involved in ignoring it. This was demonstrated all too clearly during Allied Force when the formal NATO command channels were consistently bypassed. The result was that air C2 was handicapped by a lack of clear guidance and constant higher command interference in matters that should theoretically have been delegated to the CFACC. A similar lack of guidance was evident in Ellamy because the JTCCB process central to UK, US and NATO air C2 doctrine was barely applied until the later months of the campaign.

Fourth, there is the apparently endless tension between centralised and decentralised C2 structures, functions and processes. In the UK, this was most apparent in the relationship between the MOD and the operational headquarters,

and between different tiers of operational command – for example, the (P)JHQ and JFHQ/NCHQ levels. NEC and revolutionary ISR capabilities became increasingly influential. Between them, they afforded operational and tactical commanders an unprecedented ability to monitor air operations but at the same time rapidly made more information available at higher levels, encouraging intervention from senior political or military leaders. In truth, in many of the scenarios addressed by this study, it would probably have been impossible to lay down hard and fast rules or to define an inherently correct division of authority. Nevertheless, it is important that those with air C2 responsibilities recognise the drawn-out struggle between centripetal and centrifugal command relationships for what it is, i.e., an evolving, continuous and inevitable process rather than a problem that can somehow be solved.

Fifth, air C2 is most likely to function effectively if it is underpinned by simple and rational organisational structures. If a superficial examination of C2 provisions suggests that they are complex, they will almost certainly be suboptimal too. UK C2 arrangements during Corporate were both complex and defective in several important respects – a point that was made at the time and subsequently. The over-complex nature of air C2 in Herrick was similarly obvious to many airmen even at the beginning of ISAF expansion in 2006.

US leadership of the two Gulf War coalitions provided for relative simplicity and efficiency based on the component system, as well as geographical proximity between the main headquarters if not actual co-location. By contrast, it is regrettably impossible to avoid the conclusion that NATO was a complicating factor. A particular problem here was the gap between the theory and reality of the alliance. Whatever the theory, the reality was US leadership based on the provision of military resources – including air power – on a scale that dwarfed the contributions of other member states. This imbalance served to encourage American distrust of NATO's competence and security. Equally, some NATO states often appeared resentful of the dominant US position in the alliance and of the 'special relationship' between the US and the UK. Both tension and friction were sometimes exacerbated by the far-flung dispersal of higher-level C2 facilities.

During Operation Allied Force, the Americans paid lip service to NATO's formal command structures and effectively imposed national C2. At the beginning of Operation Herrick, NATO sought to establish air C2 structures in which there was no senior USAF or RAF representation, even though the US provided the preponderance of theatre air power – by an enormous margin. It is hardly surprising that the USAF was uncomfortable with this arrangement. In Ellamy, the Americans' willingness to accept NATO C2 must be viewed in context. Quite apart from the fact that the CFACC was a USAF officer, US combat aircraft were only employed for SEAD and not to attack ground targets associated with higher civilian casualty or fratricide risks.

The sixth issue concerns air strategy. From Granby onwards, US and NATO CAOCs broadly fulfilled the function for which they were designed, managing air power on scales previously considered beyond the capacity of single air operations centres in terms of both volume and complexity. It proved far more difficult to command and control air power to achieve demonstrable operational and strategic effect. One post-Granby study defined the problem in the following terms:

The efficiency of target servicing became an end in itself ... Measures of effectiveness were based on quantifiable, though not necessarily relevant criteria. The body count is an Army example of a measure of efficiency masquerading as a measure of effectiveness. The Air Force had its equivalent – the sortie count. Sortie counts and sortie rates can tell one about the efficiency of an air force, but nothing about the effectiveness. Unless those sorties score with the right ordnance on the right targets at the right time, they are ineffective. In fact, they are less than militarily useless – they are counter-productive, since they are wasting scarce resources. Likewise, target assessment is a measure of efficiency. It can be used as *evidence* for a measure of effectiveness, but in itself only tells the extent the individual target has been neutralized ... ‘Bottom’ up assessment carries with it the implicit assumption that the exhaustion of the target list automatically results in the accomplishment of the military objectives. Unfortunately, without some way of directly measuring progress towards the commander’s goals, we are condemned to remain stuck in the ‘target assessment loop’.<sup>127</sup>

At the time, this was thought to be a feature of the CAOC structure employed in Granby. However, significant changes thereafter failed to produce a solution. This was partly because ‘boots on the ground’ operations such as Telic and Herrick primarily generated a quantitative requirement for tactical air support, but the tendency towards mission counting was also apparent in operations that did not involve a substantial land commitment, such as Allied Force. There was still a pronounced tendency to measure effort rather than effect, when effect *should* have provided the basis for both planning and assessment. Only via this

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127. J.T. Sink, *Rethinking the Air Operations Center: Air Force Command and Control in Conventional War* (unpublished thesis presented to the School of Advanced Airpower Studies, Maxwell Air Force Base, Alabama, 1993), pp. 32-33.

means could strategy and air operations have been aligned; only in this way would it have been possible to gauge the contribution of air operations to the achievement of strategic goals.

The seventh topic concerns the RAF's relationship with the USAF. Operational experience over many years has demonstrated that the Americans greatly value the RAF's air C2 expertise, experience and professionalism. From Granby onwards, this was reflected in their repeated willingness to accept RAF embeds into key positions in Air HQ and CAOC organisations – something that gave the RAF unparalleled access to senior USAF commanders and visibility of US plans, as well as the opportunity to exert influence. In short, the benefits consistently repaid the commitment involved, and it is therefore not surprising that the paramount importance of retaining these embedded posts was stressed in numerous post-operation reports from the 1990s onwards. As one UKACC put it, 'we should continue to ensure our airmen are exposed to, trained on and embedded in the US C2 architecture that continues to serve us so well.'

Finally, there are the associated issues of targeting and target engagement. Since the Falklands War, precision-guided weapons have almost entirely superseded unguided weapons in the RAF's inventory, but targeting has become more difficult. Dynamic targeting assumed a growing prominence at the expense of the deliberate, pre-planned targeting that characterised Operation Granby. Air Commanders and their staffs had to adapt to a situation in which there was a substantially reduced probability that tasked combat aircraft would release weapons. The high weapon bring-back rates associated with CAS at first appeared very uneconomic, although this feature of dynamic operations was better understood in later years.

Targeting constraints also became more exacting until, by the time Herrick was launched, engagement was only permitted if there was no expectation of civilian casualties whatsoever. The three-pillar system established to address this requirement was based on ROE, CDE and PID and proved to be very effective, but the difficulties involved should not be underestimated. The volume of ISR support available in Afghanistan was such that the risks could be minimised, but comparable levels of support cannot always be taken for granted. Herrick also demonstrated that engagement decisions could become far more complex when ground units were involved and when the ground commander declared that his troops faced an 'imminent threat' that could not be verified from the air.

The full potential of air power cannot be realised without effective and efficient command and control, yet this has often proved extremely difficult to achieve in practice. There is a great deal more to air C2 than centralised command and decentralised execution. While some of the historical problems associated with air C2 may have been solved or at least ameliorated by modern technology, organisational change and force reductions, they have been replaced by other equally daunting challenges. All too often, the official RAF records of the last four decades reveal a narrative in which airmen found themselves struggling to

retain command influence and succumbing to the inexorable draw of the control function in a process vividly portrayed by one RAF officer in 2001. His name was Air Commodore Stuart Peach.<sup>128</sup>

There is no doubt that innumerable trials and tribulations await the air C2 practitioners of the future, but of the various tools they may draw on for support and assistance, knowledge is surely the most important. The RAF has accumulated a wealth of experience in this vital area since the Falklands War but could perhaps have made better use of it. This study has sought to capture at least some of that experience to provide a basis for learning where both the theory and practice of air C2 is concerned. If by doing so it helps the RAF to exploit its considerable strengths in this area more successfully, it will have been worth writing.

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128. Air Commodore Stuart Peach, 'The Airman's Dilemma: To Command or Control', in Peter Gray (ed), *Air Power 21: Challenges for the New Century* (Ministry of Defence, 2001), pp. 123-151.

**ANNEX A: EXTRACT FROM CDS 13/92 REPORT BY THE GRANBY CO-ORDINATOR, LESSONS LEARNED FROM THE GULF WAR, 9 DECEMBER 1991.**

28. It is, of course, fundamental that military operations are undertaken in pursuit of policy established by Ministers, and that ultimately all military activities are conducted under political control. The level and extent of political supervision will depend on the nature of the operation and on Ministerial requirements. Ideally it should be as little as possible but as much as necessary: the guiding principle should be that Ministers establish the objectives and the overall policy framework within which military commanders execute operations. In practice, the division of responsibility may not be so clear-cut; in particular, in the run-up to operations or where the international dimension is complex – as it was here – Ministers may see a greater need for political control than military commanders would like.

29. There is however no doubt about the executive responsibility of the Chief of the Defence Staff. Similarly, the responsibilities of the Deputy Chief of the Defence Staff (Commitments) are clear, and his Directive from CDS states in part ‘as my Director of Operations, to co-ordinate and direct all operations and major exercises other than those delegated to single Services or subordinate Commands’. DCDS(C) performs that task through the Defence Operations Executive which is charged ‘to act as the executive agency for the central direction of operations on behalf of CDS both when operations appear imminent and during their progress’ and further ‘to ensure that the appropriate political departments are consulted during the planning, mounting and execution of operations ...’. Unease has been expressed, however, about the relationship between the Ministry of Defence and the Joint Headquarters, and the Joint Commander has noted that he sometimes felt that he had ‘been given responsibility without the associated authority,’ and that ‘at times the political imperative (as seen from MOD) appeared to delay or obfuscate sound military judgement.’

30. There is necessarily tension between, on the one hand, the military requirement to be able to conduct operations unfettered within a clear policy framework and, on the other, the Ministerial requirement to be satisfied that military activities are conducted in a way which takes account of the full range of political considerations. The level and extent of political supervision will depend upon the nature of the operation and on Ministerial requirements. Clearly, the political dimension in Operation GRANBY was complex, and it would seem that Ministerial calls for detailed information inevitably drew MOD staff (Service and Secretariat) into matters that were arguably more properly the concern of the Joint Headquarters. That, at any rate, appears to have been the perception of the Joint

Commander. In all this, it seems clear that there were misunderstandings and frustrations in the MOD/JHQ relationship, and there were also undoubtedly personality clashes. It is easy to understand the frustration of a Joint Commander, having been given his Directive, wanting to get on with it.

31. I am sure that strong and appropriate Defence Secretariat representation at the JHQ in future similar crises would be a most useful step forward. Suitable staff should be nominated for such appointments and they should participate in OOA exercises in, for example, the PURPLE series.

**ANNEX B: CDS TARGETING DIRECTIVE TO JOINT COMMANDER, OPERATION ENGADINE (ALLIED FORCE), 13 MAY 1999.**

**INTRODUCTION**

1. You are directed to undertake offensive operations to achieve HMG's objectives. Offensive action is to be co-ordinated with NATO and is to conform with the provisions of this Directive. Co-ordination of the planning effort is the responsibility of the PJHQ.

**OVERALL UK POLICY**

2. HMG's Policy. HMG's policy is to halt the violence in Kosovo in order to contain the humanitarian catastrophe. The UK and its NATO Allies have demanded: a verifiable stop to all military action, violence and repression in Kosovo; the withdrawal of the VJ and MUP; the stationing of an international military presence in Kosovo; agreement to the unconditional and safe return of all refugees and displaced persons; and a credible assurance of Milosevic's willingness to establish a political framework agreement for Kosovo.

3. UK Military Objectives and Priorities. The aim of any military action is to reduce the Serbs' capacity to repress the Kosovar Albanian population. This will be achieved by severing command and control links and lines of communication between Belgrade and Serb units in the field, degrading the operational capability of those deployed units, whilst simultaneously degrading the military infrastructure that supports Serbian aggression.

**UK TARGET SELECTION**

4. All targets for attack by UK weapon systems must be consistent with both international and domestic law and offer definite military advantage in the context of the military objectives. The paragraphs within this section contain both generic and specific-to-weapon-type instructions for targeting as well as authorised target sets and delegations.

5. UK TLAM. Attacks with UK TLAM require the Secretary of State's approval, which is to be obtained through ADI ITAG. The following points are to be noted:

a. Beyond basic target, collateral and casualty details, all requests for target approval must include whether a UK or US planned mission is to be used.

b. Missions may route over Montenegro or Albania.

6. Munitions. Normally, attacks by Tornado GR-1 and Harrier GR-7 aircraft are to be made using precision-guided-munitions (PGMs). However, where tactically appropriate, non-PGMs – either 1000lb bombs or RBL755 - may be dropped by Harrier GR-7 aircraft only. Tornado GR-1 aircraft are further authorised to fire ALARM missiles in the Target of Known Location (TKL) mode only.

7. Bombing Through Cloud. Harrier GR-7 aircraft may attack, both by day and by night, through cloud, using 1000lb bombs and RBL 755 unguided munitions, solely by reference to GPS.

8. Collateral Damage & Casualty Assessment. During target selection and attack planning you are to pay due regard to the need to keep the risk of collateral damage and civilian casualties to a minimum using the following guidelines:

a. Low Collateral Damage Risk. No civilian objects within 500m of the target.

b. Medium Collateral Damage Risk. Civilian objects within a radius 250 – 500m of the target, but no civilian objects inside 250m.

c. High Collateral Damage Risk. Civilian objects within 250m of the target.

d. Low Casualty Risk. Zero to 30 casualties.

e. Medium Casualty Risk. Thirty one to 100 casualties.

f. High Casualty Risk. More than 100 casualties.

For a stick of 1000lb unguided bombs, the calculations for collateral damage and casualty risk are to be based on the planned footprint: similarly, for RBL 755, the calculations are to be based on the explosive footprint of the weapon(s). For ALARM attacks in the TKL mode, the collateral damage risk radii may be reduced to one-third of the above values. As a general guideline, targets with a civilian casualty assessment of “high” are unlikely to be approved. However, all targets should be forwarded, with a recommendation, to ADI ITAG for consideration, and where the concrete military advantage outweighs the collateral damage or casualty risks these targets are to be passed to me (CDS) for a decision.

9. Delegation of Authority for UK Tactical Aircraft. For all weapons and attacks detailed at paragraphs 6 and 7, you are authorised to delegate authority to CBF(I) to attack targets from the following approved sets within the FRY, excluding Montenegro and the City of Belgrade (defined as a 5 nautical miles radius from BE 0251-09990), as directed by the NATO chain of command, and provided that the risk of collateral damage is no greater than medium and the risk of civilian casualties is low:

- a. Lines of Communication (LOC).
- b. POL Facilities.
- c. Military and Ministry of Interior HQs (VJ/MUP), barracks, command, control and communications (C3) facilities, equipment and ammunition storage and airfield facilities.
- d. IADS related facilities (including radars, SAM and SAM Support and associated C2).
- e. Military vehicles, armour and troop concentrations and staging areas.
- f. VJ/MUP operating, assembly and staging areas.

10. Assembly Area Targets. CBF(I) may also be authorised to approve attacks against Assembly Area targets in Kosovo provided that:

- a. Two independent sources (only one of which may be UCK) have confirmed that the areas have been cleared of their former residents, that IDPs have not moved into the areas and that this intelligence information is not more than 48 hrs old with the attack to be completed within a further 48 hrs.
- b. It is assessed that the risk of military casualties is no greater than medium and that of civilian casualties is low. For this purpose, any building for which there are 2 sources of intelligence, no more than 48 hrs old, indicating that it has been cleared of its former residents may be assumed to be empty.
- c. CBF(I) has ready access to competent legal advice.

11. Target Identification. Any target, as described in the JITL, to be attacked by UK tactical aircraft must be clearly identified by the attacking systems as outlined in NATO ROE. This can include pre-mission target study using all source intelligence.

12. Legal Obligations. The following guidelines are not exhaustive but contain major legal considerations for target selection. Wherever doubt exists legal advice is to be sought. The use of armed force must at all times:

a. Be lawful (ie, conducted in accordance with the laws of armed conflict and the law of the UK).

b. Be limited to that which is necessary (ie, only that which is required to fulfil the military objective) and proportionate to that objective.

c. Ensure that neither civilians nor civilian infrastructure or installations are targeted directly. Every effort is to be made to minimise civilian casualties and damage to civilian objects. In this context, civilian infrastructure or buildings commandeered by the VJ/MUP are deemed legitimate military targets. This extends to whole villages where intelligence indicates that the village has been cleared of its civilian population.

13. Reporting. Details of all targets attacked or to be attacked under the terms of the delegations to CBF(I), are to be passed to ADI ITAG as soon as possible. You are to keep me (CDS) informed on a daily basis of on-going and planned operations, future plans and likely associated casualties.

## CONSTRAINTS

14. Your freedom to conduct offensive operations is limited by HMG's objectives, international law, the geographical area described in the NATO ROE and the need to avoid actions which would undermine domestic or international support for the use of armed force. Moreover, the nature of this operation demands that additional constraints be placed on your freedom of action. These constraints will be exercised through the application of this Directive and the NATO ROE. The constraints and exceptions which apply are as follows:

a. Risk. The risk to UK forces is to be kept to a minimum commensurate with the military gain from the attack.

b. Area. Unless specifically authorised, attacks are to be confined to targets in the FRY (including Kosovo), but excluding the City of Belgrade (defined as a 5 nautical mile radius from BE 0251-09990).

c. Religious and Cultural Significance. You are to pay particular attention to the need to avoid damage to sites of religious and cultural significance.

d. Civilian Hostages. Particular account is to be taken of the possibility that civilian hostages may be used as “human shields”. Where evidence to support this exists, or there is doubt, guidance is to be sought from MoD.

e. Military Objects. Attacks are to be directed against military targets (eg installations, equipment and military personnel).

f. Civilian Objects. Civilian objects should not be targeted directly. When attacks on legitimate targets necessarily involve damage to civilian objects, the risk is to be flagged up when presenting the target to MOD.

g. Chemical and Biological Agents. You are not to attack known or suspected WMD storage sites and every effort is to be made to avoid attacks that might result in the release of chemical or biological agents.

## GEODETIC DATUMS

You are to ensure that all components of the targeting system consistently employ the following datum and referencing systems as designated for Op ENGADINE:

- a. Geographic co-ordinates (Lat/Long) using Spheroid WGS84.
- b. Grid references, if required, based on the Universal Transverse Mercator (UTM) system.

## EXECUTION

Offensive military operations were initiated by my (CDS) authenticated “EXECUTE” message (MODUK AAA/IAC/IAD/I9S/JEE 232030ZMAR99). CJO has been authorised to delegate to CBF Italy (A) authority to approve attacks on targets that present an immediate and emerging threat to coalition forces.

## BATTLE DAMAGE ASSESSMENT

You are to co-ordinate the collection of information to support BDA in accordance with National PJHQ SOPs and with NATO forces in theatre. You are to forward Phase 1 and Phase 2 BDA reports to ADI ITAG as soon as they are completed. Phase 3 assessments are to be made to the ADI ITAG daily.

**ANNEX C: ISR AND COMBAT AIR ASSETS ASSIGNED TO COUNTER-TBM IN OPERATION TELIC AND SUBJECT TO E-3D AIRBORNE C2.**

<b>Aircraft</b>	<b>Coverage hours per day/days per week (unless otherwise stated)</b>
<b>ISR Assets for Counter-TBM</b>	
E-3 (AWACS)	24/7
E-8 (JSTARS)	12/7 at night
RC-135 (Rivet Joint) and/or EP-3	24/7
U-2 Extended Tether Programme (ETP)	8-10/7
RAF Canberra PR-9	8/7
RAF Tornado GR-4	Periods of poor weather at night
4 x MQ/RQ-1	20 hours
P-3 AIP Coverage	When available
Unattended ground sensors (Steel Eagle)	
Traditional tactical reconnaissance assets	As available
SF ground teams, GR-4 VICON, GR-4 TIRRS	
Non-traditional ISR platforms	24/7
<b>Attack Assets for Counter-TBM</b>	
ODA and coalition ground teams	
30 x F-16C+	24/7 6-ship over Sector
10 x B-1	24/7 single ship over Sector
18 x A-10	14 for Scud Ops, 4 on CSAR alert
8 x RAF Harrier GR-7	A-10 and GR-7 combined will provide 24/7 4-ship over Sector
12 x F-15E	24/7 2-ship over Sector
24 x F-16CJ	SEAD for 24/7, 4-ship over Sector
4 x RAF Tornado GR-4	Periods of poor weather at night
4 x AC-130U	8-10/7 night coverage
MQ-1	20 hours
1 x platoon of HIMARS	As available

**ANNEX D : UK AIR COMPONENT COMMANDERS AND AIR OFFICERS COMMANDING 83 EXPEDITIONARY AIR GROUP DURING OPERATION HERRICK.**

June 2004 – December 2004	Air Commodore AF Dezonie
December 2004 – May 2005	Air Commodore DI Harrison
May 2005 – November 2005	Air Commodore MA Barnes
November 2005 – March 2006	Air Commodore GR Porter
March 2006 – September 2006	Air Commodore BM North
September 2006 – January 2007	Air Commodore CA Bairsto
January 2007 – July 2007	Air Commodore PN Oborn
July 2007 – January 2008	Air Commodore NC Randle
January 2008 – August 2008	Air Commodore MJ Harwood
August 2008 – May 2009	Air Commodore AS Barmby
May 2009 – February 2010	Air Commodore SD Atha
January 2010 – January 2011	Air Commodore KB McCann
January 2011 – December 2011	Air Commodore AD Stevenson
December 2011 – December 2012	Air Commodore SD Forward
December 2012 – December 2013	Air Commodore PJ Beach
December 2013 – November 2014	Air Commodore AK Gillespie

## ANNEX E: GLOSSARY OF ABBREVIATIONS

AAA	-	Anti-Aircraft Artillery
ACAS (Ops)	-	Assistant Chief of the Air Staff (Operations)
ACCE	-	Air Component Coordination Element
ACE	-	Air Coordination Element
ACHQ	-	Air Component/Contingent Headquarters
ACO	-	Airspace Control Order
ACOS J3	-	Assistant Chief of Staff (Operations)
AD	-	Air Defence
AETF	-	Air and Space Expeditionary Task Force
AFAC	-	Airborne Forward Air Controller
AH	-	Attack Helicopter
AHB	-	Air Historical Branch
AIS	-	Automatic Identification System
ALI	-	Air-Land Integration
ANSF	-	Afghan National Security Forces
AO	-	Area of Operations
AOC	-	Air Officer Commanding
AOR	-	Area of Responsibility
APOD	-	Air Point of Departure
ASOC	-	Air Support Operations Centre
ASR	-	Air Support Request
ATAF	-	Allied Tactical Air Forces
ATO	-	Air Tasking Order
AWC	-	Air Warfare Centre
BDA	-	Battle-Damage Assessment
BDE	-	Brigade
BFCME	-	British Forces Commander Middle East
BW	-	Bacteriological Warfare
C2	-	Command and Control
CAOC	-	Combine Air Operations Centre
CAOC Dir	-	CAOC Director
CAP	-	Combat Air Patrol
CAS	-	Chief of the Air Staff
CAS	-	Close Air Support
CBFI(A)	-	Commander British Forces Italy (Air)
CBF (R-S)	-	Commander British Forces Resinate (South)
CBFSU	-	Commander British Forces Support Unit
CDE	-	Collateral Damage Estimate

CDI	-	Chief of Defence Intelligence
CDM	-	Collateral Damage Methodology
CDS	-	Chief of the Defence Staff
CENTCOM	-	US Central Command
CFACC	-	Combined Forces Air Component/ Air Contingent Commander
CFC	-	Combined Forces Commander
CFLCC	-	Combined Forces Land Component Commander
CINCSOUTH	-	Commander-in-Chief Allied Forces Southern Europe
CJCS	-	Chairman of the Joint Chiefs of Staff
CJO	-	Chief of Joint Operations
CJTF	-	Combined Joint Task Force
CJTF HQ	-	Combined Joint Task Force Headquarters
CMC	-	Chairman of the Military Committee
CNS	-	Chief of the Naval Staff
COER	-	Central Organisation for Electronic Research
COIN	-	Counter-Insurgency
COMAIRSOUTH	-	Commander Allied Air Forces Southern Europe
COM CJTF	-	Commander Combined Joint Task Force
COMFIVEATAF	-	Commander Fifth Allied Tactical Air Force
COMISAF	-	Commander ISAF
CONOPS	-	Concept of Operations
COS	-	Chief of Staff
CSAR	-	Combat Search and Rescue
CTCB	-	Combined Targeting Coordination Board
CTF	-	Commander Task Force
D CinC Ops	-	Deputy Commander-in-Chief Operations
D Def S	-	Director of Defence Studies
DAIT	-	Deployed Air Integration Team
DASC	-	Direct Air Support Centre
DCA	-	Defensive Counter-Air
DCDS	-	Deputy Chief of the Defence Staff
DCDS(C)	-	Deputy Chief of Defence Staff (Commitments)
DCFACC	-	Deputy CFACC
DCOM	-	Deputy Commander
DCOS	-	Deputy Chief of Staff

DIME	-	Diplomatic, Information, Military, Economic
DIS	-	Defence Intelligence Staff
DMPI	-	Direct Mean Point of Impact
DMSB	-	Dual Mode Seeker Brimstone
EAG	-	Expeditionary Air Group
EAW	-	Expeditionary Air Wing
ELINT	-	Electronic Intelligence
FAC	-	Forward Air Controller
FLC	-	Front-Line Command
FLF	-	Free Libya Forces
FLOT	-	Forward Line of Own Troops
FMV	-	Full-Motion Video
FOB	-	Forward Operating Base
FRY	-	Federal Republic of Yugoslavia
FSCL	-	Fire Support Coordination Line
GAT	-	Guidance, Apportionment and Targeting
GBAD	-	Ground-Based Air Defences
GCAS	-	Ground Close Air Support
GLO	-	Ground Liaison Officer
GMTI	-	Ground Moving Target Indicator
GSE	-	Ground Support Equipment
HQBFME	-	Headquarters British Forces Middle East
HQSTC	-	Headquarters Strike Command
HUMINT	-	Human Intelligence
HVI	-	High-Value Insurgent
IADS	-	Integrated Air Defence System
IDP	-	Internally Displaced Persons
IED	-	Improvised Explosive Device
IJC	-	ISAF Joint Command
IO	-	Information Operations
ISAF	-	International Security and Assistance Force
ISR	-	Intelligence, Surveillance and Reconnaissance
ISRD	-	Intelligence, Surveillance and Reconnaissance Division
JAC	-	Joint Analysis Centre
JDP	-	Joint Doctrine Paper
JFACC	-	Joint Forces Air Component Commander
JFACHQ	-	Joint Forces Air Component Headquarters
JFC	-	Joint Forces Commander

JFOS	-	Joint Forces Operations Staff
JHQ	-	Joint Headquarters
JOA	-	Joint Operational Area
JOC	-	Joint Operations Centre
JPEL	-	Joint Prioritised Effects List
JPITL	-	Joint Prioritised Integrated Target List
JRRF	-	Joint Rapid Reaction Force
JSOA	-	Joint Special Operations Area
JSP	-	Joint Service Publication
JTAC	-	Joint Terminal Attack Controller
JTAR	-	Joint Tactical Air Support Request
JTCB	-	Joint Targeting Coordination Board
JTFC	-	Joint Task Force Commander
JTM	-	Joint Targeting Memorandum
KEZ	-	Kosovo Engagement Zone
KI/CAS	-	Kill-Box Interdiction/Close Air Support
KTO	-	Kuwait Theatre of Operations
LGB	-	Laser-Guided Bomb
LI	-	Lesson Identified
MAAP	-	Master Air Attack Plan
MANPAD	-	Man-Portable Air Defence System
MEF	-	Marine Expeditionary Force
MOD	-	Ministry of Defence
MPA	-	Maritime Patrol Aircraft
MSC	-	Mission Support Cell
MTO	-	Mission Type Orders
MUP	-	Yugoslav Military Police
NAC	-	North Atlantic Council
NCC	-	National Contingent Commander
NCHQ	-	National Contingent Headquarters
NEC	-	Network-Enabled Capability
NEO	-	Non-combatant Evacuation Operation
NFZ	-	No-Fly Zone
OCU	-	Operational Conversion Unit
OEF	-	Operation Enduring Freedom
ONW	-	Operation Northern Watch
OOA	-	Out of Area
OPCON	-	Operational Control
OPLAN	-	Operation Plan
OSW	-	Operation Southern Watch
NTISR	-	Non-Traditional ISR
PGF	-	Pro-Gaddafi Forces
PGM	-	Precision-Guided Munitions

PID	-	Positive Identification
PJHQ	-	Permanent Joint Headquarters
POL	-	Pattern of Life
PSAB	-	Prince Sultan Air Base
PWHQ	-	Primary Warfare Headquarters
RAOC	-	Regional Air Operations Centre
RC(S)	-	Regional Command South
RC(SW)	-	Regional Command Southwest
RFL	-	Restricted Fire Line
ROE	-	Rules of Engagement
RSAF	-	Royal Saudi Air Force
SACEUR	-	Supreme Allied Commander Europe
SAM	-	Surface-to-Air Missile
SAR	-	Synthetic Aperture Radar
SDR	-	Strategic Defence Review, 1998
SEAD	-	Suppression of Enemy Air Defences
Sec (O)(C)	-	Secretariat Overseas Commitments
SF	-	Special Forces
SIGINT	-	Signals Intelligence
SIPRNET	-	Secret Internet Protocol Router Network
SME	-	Subject-Matter Expert
SNR	-	Senior National Representative
SPINS	-	Special Instructions
SRAFO	-	Senior RAF Officer
STANEVAL	-	Standards Evaluation
Strat	-	Strategy
STRATCOM	-	Strategic Communications
SU	-	Supported Unit
TACC	-	Tactical Air Control Centre
TACS	-	Tactical Air Control System
TAOC	-	Tactical Air Operations Centre
TBM	-	Theatre Ballistic Missile
TD	-	Targeting Directive
TEA	-	Target Engagement Authority
TEZ	-	Total Exclusion Zone
TF	-	Task Force
TFH	-	Task Force Helmand
TFL	-	Task Force Leatherneck
TIALD	-	Thermal Imaging Airborne Laser Designator
TIC	-	Troops-in-Contact
TLAM	-	Tomahawk Land-Attack Missile
TOA	-	Transfer of Authority

Trg	-	Training
TST	-	Time-Sensitive Targeting
UAV	-	Unmanned Air Vehicle
UCK	-	Ushtria Çlirimtare e Kosovës (Kosovo Liberation Army)
UKACC	-	UK Air Component/Contingent Commander
UKRAOC	-	UK Regional Air Operations Centre
UNMOVIC	-	UN Monitoring, Verification and Inspection Commission
UOR	-	Urgent Operational Requirement
USMC	-	US Marine Corps
VCDS	-	Vice Chief of the Defence Staff
VJ	-	Yugoslav Army
WMD	-	Weapons of Mass Destruction
XCAS	-	Airborne Close Air Support
X-INT	-	Airborne Alert Interdiction