Air power and the future battlespace

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INTRODUCTION

The aim of this paper is to consider the role of air power in the future, within the wider security environment and across the full spectrum of conflict. The key is to make some reasonable assumptions about the future strategic environment for the next ten to fifteen years, extrapolating from our experience since the end of the cold war and our existing knowledge of potential state threats and sub-state threats and challenges. One of our failings since the end of the cold war has been to focus on the operational level of war at the expense of thinking hard about national strategy. The formulation of national strategy is supposed to be directed by government, but if that government fails to provide strategic direction, as it has done over recent years, the result is short-termist perspectives, and a 'hand to mouth' approach to crisis management. This has been reinforced further by financial constraint and the electoral cycle. Ideally, a strategic perspective helps us not only to set our current age in a much wider context, thus preventing or making us less inclined to 'knee-jerk' reactions to single events, but it also assists in the making of correct judgements about the nature of a conflict or scenario, thus enabling us to apply the appropriate type of tool (air power or otherwise). History is littered with instances of the inappropriate use of military force, and air power is no exception, and we cannot afford nugatory manpower and material expenditure. The challenge is, therefore, enormous: to meet current commitments, while preparing for future possibilities.

The paper's principle contention is that we will be committed to counter-insurgency scenarios for the foreseeable future, which, it should be emphasised, represents a continuum of COIN commitment since the end of the Second World War, and that these commitments will consume a major proportion of defence resources[1]. Indeed, it is a stated air force planning assumption that it will continue to support land operations in Iraq and Afghanistan, in essence, for as long as it takes[2]. However, it is also the paper's contention that we should not focus on counter-insurgency operations to the exclusion of other possible commitments. This paper is intended, in part, to be a corrective to the dangerous line of argumentation appearing after 9/11 which advocated our completely reconfiguring our armed services to meet the terrorist threat. The danger posed by rogue states has not evaporated, and there is still a requirement for strategic effect operations, or at the very least deterrence, against nations which pose a threat to our national security. The paper also aims to redress the balance after a decade of viewing air power very largely as a supporting component in the joint environment. The paper also seeks to challenge the accepted wisdom that joint means land supported by maritime and air. The nature of a conflict or whatever the scenario determines which Service environment is dominant, and this can change over time. In short, we must be able to operate effectively across the full military spectrum, from peace support operations (PSO), through to counter-insurgency (COIN), to 'high end' war-fighting.

Given Britain's financial constraints, we cannot afford to recapitalise the RAF in the foreseeable future, and so we must think harder about how we utilise what assets we have. This does not mean purely thinking about which platforms can perform what variety of roles, but it entails a fundamental step change in air power conceptualisation in

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this country and, in particular, invigorating the RAF so that it becomes a far more thoughtful organisation. Good doctrinal and conceptual work is, in itself, a vital force multiplier, especially in financially constrained times. The effects based approach (EBA) will play a major part in this. An emphasis on second and third order effects analysis has already replaced the one-dimensional 'weapons effect' focus common during the 20th Century. This new emphasis is particularly important in wars of choice, during which the application of any type of military force is problematic because of the multitude of political constraints, but also because of the politicians' penchant for using air power as a 'quick win', limited footprint option. In the immediate term, additional work urgently needs to be done on counter-insurgency warfare and air power effect, especially non-kinetic effect and the psychological impact of air power. We must also, necessarily, continue to develop our relationship with the Americans, who will provide an essential insurance policy against big state and conventional threats in the future. Concurrently, we must encourage qualitative and quantitative capability development within NATO and the EU. This is vital, both to protect Europe from any potential big state threats, and also to foster greater capability burden sharing across NATO and the EU in current and future expeditionary operations.

This paper will consider a variety of issues: air power for strategic effect and UK current and near-term air power capability. The second half of the paper will address air power in COIN, including its limitations and measuring effect in COIN, and air power innovation in COIN.

1.0 AIR POWER FOR STRATEGIC EFFECT

Innovative thinking has to include consideration how we will deal with a resurgence of inter-state warfare. The accepted orthodoxy in most military circles today is that 'war among the people' will become the norm, and that the probability of state on state war is slim[3]. This is a very dangerous presumption, and history shows the folly of absolutist positions (such as the global conflict of 1914-18 being 'the war to end all wars') or those who would argue that 'only recent experience is relevant'. Since the end of the cold war, air power doctrine in most western nations has focused on air power's contribution to the joint environment[4]. Not only has there been little work on strategic effect since the 1980s, especially independent strategic effect performed by the Air Force, but jointery has come very close to being the new dogma. In the United States, the most tangible demonstration of this was seen in the demise of Strategic Air Command, which was dismantled very rapidly between 1992 and 1993. While this was, clearly, a cold war instrument, the way in which Strategic Air Command was expunged from the USAF was very revealing. Any officer above the rank of Lt Col who had come up through the SAC route could not expect promotion, and individuals like Col John Warden, who had heavily influenced the strategic air campaign in Gulf War I, were marginalised[5]. More recently, the US Chief of Staff of the Air Force, General Moseley, and the Secretary for the Air Force, were forced to resign because they both advocated the need for a balanced force structure, including long range platforms, and this was seen to be 'off message' because of current counter-insurgency operations in Iraq and Afghanistan. In Britain, similarly, there was increasing talk of making the RAF a purely supporting arm, and as recently as 2003, some influential senior airmen were even subscribing to the British Army's idea of reconfiguring the Air Force along US Marine Corp lines. In a number of Air Force circles, to be seen to advocate an ongoing requirement for strategic effect was viewed as 'old fashioned and obstructive thinking'.

There are a number of reasons why we need to think about the application of air power (and any type of military force or other levers of power) for strategic effect. UK defence policy must continue to counter threats to the UK homeland and interests overseas, and our defence resources must also continue to promote international stability. This has to include consideration of air power's employment in non-kinetic roles, ranging from humanitarian relief to 'shows of force' for deterrent effect. State threats to the UK and her vital interests are not a thing of the past. There are a number of 'countries of concern', including Iran, North Korea, China and Russia. The two former countries have caused or are in the process of causing regional instability, while the latter has recently reinstated cold war era types of activity[6].

Iran is cause for concern on a number of counts. First, it views itself as a regional superpower, hence its nuclear aspirations. Second, its behaviour in the region and on the international stage is all to do with regime survival. These make for a potent mix. In addition to seeing itself as the protector of Shia Islam, the number one strategic objective for the current Iranian regime is control over or, at the very least, considerable influence over, Iran's neighbours. It is actively trying to create a proxy state in Iraq, and its foreign policies are all centred on creating instability in surrounding Sunni states. Hezbollah is an Iranian creation, and Iran's policies have continued to fuel Israeli-Palestinian enmity. The Iranians have learned from US foreign policy handling in the past that if a state possesses nuclear weapons, then the US becomes more compliant. At least, this appears to be the lesson Iran took away from the diplomatic stand-off between the US and North Korea. After the North Koreans conducted low yield nuclear tests in October 2006, the US threats of punitive action over North Korea's missile research largely evaporated. Although some commentators have dismissed the possibility of Iran attempting again to block the Straits of Hormuz, as it did in 1980s, the Iranian leadership has made a number of thinly veiled threats to use oil as a retaliatory weapon if the US resorts to military action against Iran over its nuclear programme. Any instability caused by Iran in the region will certainly affect oil prices[7].

North Korea, meanwhile, poses a similar source of instability in the Far East, with its nuclear aspirations and missile developments, prompting, among other things, a rapid expansion of the Japanese 'self-defence' force and renewed US interest in the western Pacific. The US has long regarded North Korea as 'isolated, xenophobic, and resistant to reform' and a serious threat to South Korea[8]. Of particular concern to the US is North Korea's ballistic missile programme and the threat it poses to US interests in Europe and elsewhere, and this has been the principal driver behind the American proposal to establish a national missile defence (NMD) site in Europe. This proposal was given added urgency in 2006 when North Korea conducted a low-yield nuclear test and stated its intention to equip its long range missiles with nuclear warheads.

The other reason for increased US presence in the Western Pacific is, of course, China. While China may not pose an immediate threat to British interests in the Far East, China's posturing, economic growth and increased defence expenditure, especially over the last ten years, are of concern to the US. China undoubtedly has superpower aspirations. This is evident in the manner in which China has gone about economic expansion, with reckless disregard for the citizens of China (especially the environmental implications of rapid industrial and technological expansion) and peoples of those nations being seduced into 'co-prosperity' type trade relationships (especially in Africa). How China has treated its immediate neighbours is also instructive, and Tibet is not the only country to have been subjected to Chinese will. The country has a long history of exploiting its neighbours, especially Vietnam, whom it has invaded countless times, and China tends to abide by International Law extremely selectively. It has admitted to an annual 18% growth in its defence expenditure since 2000, and that is only the declared figure. It has 'blue water' aspirations, as evidenced by its recent carrier programme and ongoing research into silent-running nuclear powered and ballistic missile equipped submarines, and believes that it has the right to declare the 'second island chain' (out as far as New Guinea) as its defensive perimeter in the Pacific. This is being done under the pretext of a perceived threat from land-attack cruise

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missiles, but nor should we discount the possibility of 'out of area' operations, including bids to take possession of Taiwan and the Spratley Islands. Meanwhile, its indigenous aircraft industry is producing platforms of increasing sophistication, and China's recent foray into space and use of anti-satellite missiles has prompted the US to revisit not only its space doctrine but has also led to increased funding for NASA[9].

However, of all the potential threats, Russia is in many senses the most serious, or at least can be seen as a threat which never completely dissipated after the end of the cold war. Russian defence spending has increased markedly over the past five years, in spite of domestic funding pressures, and Russian doctrine and exercising reveal a focus on a classic cold war scenario. The latest Russian military doctrine assumes a confrontation with NATO forces, and during recent exercises, a Russian 'Bear' penetrated UK airspace, and there has also been regular probing of both Alaskan airspace by 'Blackjacks' and 'Backfires' and British territorial waters by Russian submarines. This is undoubtedly in response to NATO's desire to position a defensive missile screen in Poland and the Czech Republic, which Russia regards as an inflammatory action. But since the end of the cold war, not only have the Russians maintained a viable strategic strike capability within their submarine fleet, but the use of both strategic and tactical nuclear weapons remains central to Russian planning assumptions. As Russia is on the periphery of European security relationships, the fragility of its democracy and recent military posturing mean that we would be unwise to dismiss it as a potential threat. Indeed, it seems that Russia has been emboldened by the West's, and specifically NATO's, less than robust reaction to its recent incursion into Georgia. The significance of the Russian offensive into Georgia is that this was the first military action undertaken by the Russians since the end of the cold war, and it proved that they are intent on displaying their power projection capabilities. This was a clear piece of signal sending to the international community[10].

Interestingly, some defence commentators have dismissed the threat posed by the Russians on the basis of their performance during the Georgian confrontation. They argue that Su-25 'Frogfoots' lacked sophisticated aiming devices, did not have long-range missiles which could be launched beyond an enemy's air defence envelope, lacked smart weapons and electronic counter-measures (resulting in between four and seven Russian losses, depending on sources, because Russian systems did not identify the Georgian air defence radar as hostile). The fact that the Tu-22 'Backfire', usually employed as a strategic bomber, had to be re-tasked as a reconnaissance platform was also highlighted as proof that the Russians are short of reconnaissance aircraft, in spite of supposed UAV procurement over the last decade. However, what such commentary overlooks is the fact that the Russians were able to establish overall air superiority, and neutralise the Georgian command and control systems with apparent ease. The Russians also engaged in effective cyber warfare, completely destroying most Georgian government websites. So, although the Russians had evident difficulties with IFF[11] and their air-land integration was rated as poor in comparison with NATO standards, the Russians successfully made their point[12].

2.0 STRATEGIC AIR POWER AND THE UK

In the face of such potential state threats to the UK and her vital interests, and in view of the constraints on the size and capability of UK forces, our relationship with the Americans remains critical. What the Americans offer is a credible and overwhelming offensive capability, available on high readiness, and this ability to apply extreme violence is the cornerstone of classic deterrence strategy. This is one of the prime drivers behind the current strategy to harmonise the RAF with the USAF[13]. However, harmonisation has some inherent problems, and there are major implications for the RAF, and British air power generally, if we pursue an increasingly



Figure 1. F-35.



Figure 2. Su25 Frogfoot.

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Figure 3. Astor.

close relationship with the Americans. These inherent problems and implications may not, necessarily, have been thought through fully.

In 2006, it was announced that the strategic priority for the RAF is to 'harmonise air power capability, concepts and doctrine with those of the US forces'[14]. In doctrinal and conceptual terms, the major implication for the RAF, in particular, has been a refocusing on strategic effect. In 2006, USAF Chief, General Moseley, stated that he wanted the USAF to bear in mind its doctrinal roots and to get away from the idea that the Air Force is a purely supporting element. His rationale for pushing this particular line was two-fold: first, he acknowledged the potential state threats to the US and her vital interests, and he stated recently that we cannot afford to become 'fixated on counter-terrorism and insurgency'[15]. Second, he wanted to see a major recapitalisation of the USAF (having made the point that the average age of a USAF platform today is nearing 30 years, whereas when he joined the USAF, it was 7-8 years). It is noteworthy that the USAF's top five procurement priorities are not COIN specific. They are: the KC-X tanker (to replace the KC-135 and KC-10 fleets); the new Combat Search and Rescue helicopter; a new satellite system for communications and infra-red sensors for ballistic missile warning; the F-35 Joint Strike Fighter; and a new generation long range bomber (to replace the B-1 and B-52).

British air power doctrine has recently been updated to include the latest thinking on effects based warfare and the comprehensive approach. However, the RAF's renewed interest in air operations for strategic effect (AOSE) has attracted criticism from the other Services, who view this as a retrograde step and as an indication of the RAF's insecurity. The other Services, and the Army, in particular, need to understand that strategic effect is not an Air Force 'hobby horse' and a means of justifying its independence. They need to understand how strategic effect air operations contribute to the achievement of land and maritime objectives in most campaigns, and also how air operations for strategic effect may just obviate the need for land or maritime operations at all in certain scenarios. Also, it needs to be emphasised that the RAF's conception of strategic effect is much broader than the American, as the latter focuses almost exclusively on kinetic effect, while the RAF concept acknowledges the importance of non-kinetic strategic effect (including humanitarian relief operations and 'shows of force'). So, whereas General Moseley argued that 'the soul of an air force is range and payload and the ability to access targets on a global scale'[16], the RAF equivalent may be: 'the soul of an air force is range, payload and the ability to access targets and influence on a global scale'.

Therefore, any conceptual and doctrinal work done by the RAF over the next few years will need to articulate very carefully as to why air operations for strategic effect are important, both within and potentially beyond the joint environment, and how these operations encompass both kinetic and non-kinetic effect. One of the biggest obstacles to understanding the importance of strategic effect in the modern era will be peoples' perceptions of past practice, especially the images of mass destruction coming out of conflicts such as World War 2 and Vietnam. Therefore, increasing peoples' understanding of air power for strategic effect should be a top priority for the RAF. Articulating the role played by strategic effect air power in conflicts such as Gulf War I, where the air campaign against Saddam's command and control (C2) and infrastructure enabled the prosecution of a much easier Land war, will be vitally important[17]. Convincing the other Service environments that air power can, occasionally, be decisive by itself will be much more difficult to sell, but there are examples, such as the Israeli attack on the Iraqi nuclear facility at Osirak in 1981, or one of the finest examples of non-kinetic, strategic effect, the Berlin airlift of the late 1940s, which was a classic piece of humanitarian relief but also sent a signal to the Soviets about the West's capability and resolve.

How air power can affect the cognitive domain, especially at senior decision-making levels, demands a great deal more work. There are two main problems associated with this area. First, in order to have a coercive impact on or influence an adversary's leadership, you must have a profound intelligence understanding of the target nation and the leadership, in particular. With closed societies, such as North Korea, this is problematic. Second, the extent to which air power alone has a coercive impact is very difficult to judge if a variety of coercive levers are being utilised. This is why judgements on the efficacy of strategic bombing in World War II are still being debated, and we may never know the precise extent to which NATO's bombing during the Kosovo campaign caused Milosevic to capitulate. One of the most serious flaws in historical air campaign planning has been to 'mirror image', and assume that a particular target nation or leadership will behave as you would under similar circumstances. The Americans fell into this trap in both the Korean and Vietnam wars. They assumed in each case that the communist leadership attached the same value to material (especially industrial) targets. In both these conflicts, coercive leverage was negated by cross-border outside suppliers of war materiel, and it was eventually realised that the most important air power effect was Air Interdiction and not strategic bombing.

The use of air power for coercive or deterrent effect is currently under reconsideration. Most of the thinking performed in the early 1990s was heavily influenced by cold war models, but, since 9/11, a 'one size fits all' approach is clearly outdated. The US has sought to develop deterrent postures tailored to meet specific threats, including terrorist attacks, state sponsorship of terrorist organisations, WMD technology transfer and WMD acquisition by rogue states. This move towards 'tailored deterrence' may result in a more subtle US air power doctrine, with less emphasis on kinetic effect, and will, therefore, have more in common with British air power doctrine, especially the very latest iteration due to be published in 2009[18].

3.0 AIR POWER CAPABILITIES: NATIONAL AND INTERNATIONAL OPTIONS

The practical benefits of harmonising with the USAF and other American forces are obvious. In an uncertain world, the best insurance policy and greatest flexibility come from having a full spectrum of capabilities. As we cannot afford this full spectrum, the RAF has to accept some capability gaps. To date, one of the most expensive and largest capability gaps has been in SEAD (suppression of enemy air defences). This is likely to remain an area where we will depend heavily on the US, simply because of the enormous cost involved, although new and affordable technology will increasingly allow us to address threats with non-kinetic means. Other areas of capability shortfall where the Americans will continue to be the principal providers include combat search and rescue (CSAR), theatre ballistic missile defence (TBMD) and long-range attack. But increased harmonisation with the US may allow us to

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Figure 4. C-17.

investigate other options for capability sharing. However, unless you can be very certain of your alliance partners' reliability, niche role playing within alliances is a potentially dangerous route to pursue, especially in an age of 'wars of choice'. Those who have advocated niche role playing within the European Defence Force, giving key capabilities such as strategic air transport to France, for example, need to be realistic. This is why it is vital that harmonisation with the US forces, especially between the USAF and the RAF, is codified and instrumented in a tangible form while the opportunity still exists. Harmonisation must go well beyond mere doctrinal and equipment compatibility, and regular exercising; it must include not only an increased number of exchange posts but the imbedding of each others' personnel in core policy and planning processes. This process has already begun, with the first USAF Colonel to work in the RAF's future concepts area of MoD, and a reciprocal appointment of an RAF Group Captain to the Pentagon. Another indication of the USAF's desire to enhance its relationship with the RAF was the recent decision to allow a British student to attend the School of Advanced Air and Space Studies at Maxwell Air Force Base. Until 2005, this school was strictly off limits to foreign nationals, and there are no plans to extend this privilege beyond British participation[19].

Although the RAF is the chief beneficiary of increased harmonisation with the US forces, it is not an entirely 'one way street.' From the time of the cold war, right up to the most recent operations, the UK has provided certain capabilities which the US has been unable to match. The unclassified nature of this paper precludes a detailed discussion of most of these, but the Americans have acknowledged in open forum their appreciation of some UK capabilities in the alliance and coalition context. These include the RAF's offensive counter air (OCA) operations during Op Granby in 1991; air to air refuelling (AAR) provided by the RAF during Operations Allied Force and Enduring Freedom, about which the US Navy has been particularly complimentary because of support given to its F-14s and F-18s over Afghanistan; the RAF's future long range target and tracking radar (ASTOR); and the RAF Regiment's recent provision of advice to the USAF as it develops its own organic force protection[20].

4.0 CURRENT AND NEAR-TERM CAPABILITY

Forging closer links with the Americans may lead some to conclude that Britain is turning her back on Europe. In fact, a good case can be made for this linkage actually assisting in American and European air forces integration. Indeed, there are good reasons why Britain needs to maintain a leading role in NATO and the European Defence and Security Policy (ESDP) framework. One of the most important reasons is the requirement for global reach, as highlighted in the latest future air and space operational concept (FASOC). A strategic imperative for both Britain and the US is to encourage

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Figure 5. Nimrod MR2.

European partners to develop capabilities to achieve this global reach, especially strategic air lift, air to air refuelling and ISTAR. Operation Allied Force revealed major capability gaps, and, since then, the US and Britain have been urging the other European powers to close the 'capability gap' in order for European nations to take a full and equal part in NATO and European obligations, and possibly to share the burden of commitments in other theatres. As one observer has noted: 'the strengths, capabilities and cohesion of the members of the NATO alliance … have important implications for the US', though, arguably, the US will retain the full capability spectrum regardless of European procurement[21]. For example, a long-range attack capability would be beneficial, but Europe is highly unlikely to fund what would be an expensive and controversial project.

While the US and the UK have criticised European alliance partners for their capability gaps, the UK needs to address its own shortfalls in key capabilities, and some capability shortfalls have a substantial impact on the UK's ability to perform certain roles. air power can be divided, essentially, into four main roles: project, protect, collect and affect. Project is the ability to deploy and sustain effective military power around the world. Protect covers all aspects of guarding the deployed force and its line of communication. Collect covers all forms of data gathering: intelligence, surveillance and reconnaissance. Affect is the ability to take effective action, both kinetic and non-kinetic.

The latest FASOC concept identifies the need to 'move and support men, material and assets at speed over strategic distances' (project), but the most glaring capability gaps for the UK since the end of the cold war has been the lack of strategic airlift. The air transport fleet and its infrastructure were repeatedly cut after 1991 in order to prop up other operational imperatives. However, these cuts were puzzling given the increasing number of peace support scenarios to which we were committed during the 1990s, not to mention the official stated defence policy of increased engagement in expeditionary warfare. The current official line is that we should be able to respond to a variety of complex demands, often with little warning. So, there is an urgent need to think hard about how best to deliver a rapid response capability, across the full spectrum of military operations, from humanitarian relief and PSO through to medium and high intensity conflict. Although the presumption is that we will not engage in the latter unless we are alongside the Americans or as part of some credible coalition, we need to consider the full range of national assets (including commercial avenues) to achieve such a heightened responsiveness. The aspiration is to have agile groups deployed to a theatre within two days of call up. This is undoubtedly optimistic, given the increased training and logistics support required (and the rigors of expeditionary warfare have been graphically highlighted by our involvement in Afghanistan, where aviation fuel has to travel by road to Khandahar and is, therefore, vulnerable to insurgent attack)[22]. But to have very responsive agile groups is a stated aspiration.

The bottom line which needs to be articulated forcibly to government is that if we are to engage in global reach, especially to meet conventional warfighting commitments, airlift has to be funded adequately. A viable air transport fleet is not merely a 'nice to have', it is the key enabler. Indeed, a recent House of Commons Defence Select Committee has noted the lack of UK Air Transport. The RAF's principal strategic airlift platform, the C-17, is currently flying nearly double the hours originally envisaged. The RAF has 25 Airbus A400 aircraft on order but the programme is some 15 months behind schedule, and the planned in service date of 2010 is now improbable[23]. Given financial constraints, the RAF may not have an effective strategic airlift capability to meet global mobility requirements for another decade.

Global reach also implies global awareness, not only in terms of persistent ISTAR (Intelligence, Surveillance, Target Acquisition and Reconnaissance), but also a fully networked battlespace awareness (Collect). A fully functioning network enabled capability remains an aspiration, but considerable progress has been made over the last few years. Employment of UAVs has proved very successful both in Iraq and Afghanistan. *Desert Hawk* has been used extensively in a range of tasks, from support to combat operations to deterrence. The latter impact is important because it is another instance of non-kinetic effect being achieved. Insurgents have come to understand the connection between UAV reconnaissance and subsequent kinetic effect against their positions, so UAVs have themselves become a 'show of force' at one remove. Meanwhile, the US Predator has provided additional range and persistence in both these theatres, and has also proved itself as a weapons platform (when equipped with Hellfire missiles). If we aspire to true global reach and mobility, ISTAR should be viewed as a key enabler and strategic asset. Timely and accurate information and intelligence will enable us to economise on effort, as well as increasing our responsiveness. Therefore, although ISTAR is another one of those very expensive key enablers, it is a force multiplier and demands immediate investment. The existing Nimrod MR2 fleet is not only aged but the air-to-air refuelling of these aircraft is now under scrutiny after the loss of an aircraft in September 2006 due to a design fault[24].

Looking ahead to the future, the most essential prerequisite for any air, land or maritime operations remains control of the air (Protect). This involves the 'destruction, degradation or disruption of enemy aircraft and missiles', and was played down as a capability after the end of the cold war. It has been the subject of much ill-informed debate since, especially among the other Services. This is nothing new. Of all the air power roles, control of the air has been the most difficult to articulate and measure, and has been at the root of some of the most bitter inter-Service debates, going back as far as the First World War. Trenchard, himself, had difficulty, at first, when measuring effect in this role, as he initially defined success in terms of how far his aircraft could penetrate German airspace, and regarded this as an end in itself. Then, in the early years of the Second World War, the RAF was often referred to as the 'royal absent force' until such time as land and maritime commanders came to appreciate that the air superiority battle was often being fought over the horizon, and that control of the air had to be achieved before air power could support surface operations. General Montgomery articulated this well in 1942: 'If we lose the war in the air, we lose the war and we lose it quickly'[25].

During the cold war, the need to defend British air space against fixed wing and missile threats put a premium on air defence as a role. However, since then, a 'peace dividend' and budgetary constraint have meant increasing pressure on this role. The most apparent pressure has been seen in the procurement of some 232 Typhoons, envisaged originally as air defence assets. The Air Force

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has tested the potential of the aircraft in a variety of roles, and trial work thus far points to its potential as a very capable multi-role platform, including ground-attack. However, it is still seen as a cold war legacy procurement by many, especially within army circles, and this is in spite of events such as 9/11. Hijacked commercial aircraft are only one means by which adversaries could exploit the air environment. Against a full spread of adversaries, from terrorist cells through to foes engaging in high intensity warfare, we need the most capable air control systems, and this must include consideration of ground based air defences (GBAD). Even if a direct attack on the UK mainland is viewed as unlikely in the near-term, attacks on deployed British forces is happening on a daily basis. Therefore, air defence of all types is essential[26].

The dangers of dismissing air defence or control of the air as a capability can be found in numerous historical cases. We came very close to defeat in 1940 because of an air power doctrine which emphasised strategic bombing to the exclusion of almost all other air power roles. Britain was saved during the Battle of Britain for two principal reasons: first, an independent enquiry launched in 1937 highlighted the parlous state of British defences, and, second, the foresight and gritty determination of the AOC-in-C of fighter command, Sir Hugh Dowding, ensured the building of what we would call today an integrated air defence system (IADS). In more recent times, the New Zealand government axed its fast jet community, arguing that air defence and a strike capability were not necessities for that country. The Prime Minister, Helen Clarke, argued that, in any case, New Zealand would be able to call upon her alliance partners (the Australians and the Americans) should the country come under attack. The Bali bombings and known Al-Qaeda presence in the South Pacific prove the naivety of the current New Zealand government, but the air defence and strike capability that the RNZAF once possessed is almost certainly lost forever. As a result, that country must content itself with being relegated to a second tier player in the Pacific region. There are important cautionary lessons in such examples. Even if we cannot afford the full spectrum of capabilities, there are some which are so fundamental that we should not compromise. Control of the air is one of those capabilities which has doctrinal primacy for a reason, and the RAF needs to present this as a non-negotiable position. It also needs to remind the other Services that, with the possible exception of the first three days of the Falklands War, they have had freedom of manoeuvre since the end of the Second World War, and how this has been taken for granted. Any future operations, especially in the expeditionary context, rely on our ability to control the air, otherwise the risks to our forces will be unacceptable.

5.0 AIR POWER IN COUNTER–INSURGENCY WARFARE

In the face of increasing budgetary constraint, Britain, and the RAF in particular, can improve its position by engaging in high order conceptual work. One of the most valuable theoretical legacies of Clausewitz's work was a reminder that war is a 'dynamic contest'. If we are not thinking profoundly about the current operational environment, actual or potential enemies most certainly are. States or sub-state actors who are not bound to us by either treaty obligations or cultural affinities are studying the West's weaknesses and vulnerabilities. This is especially true of insurgencies, because the insurgent's material foundation is usually small, so he needs to think harder about circumventing the West's material and technological superiority. The unclassified nature of this paper precludes an in depth discussion of insurgent methods in Iraq and Afghanistan, suffice it to say that he US and UK military have been surprised and impressed by insurgent innovations and methods. For example, the insurgents have developed sophisticated surveillance networks to monitor coalition fixed wing and rotary activity in order to give advanced warning of air operations. What they have also taken on board, like many previous insurgencies, is that you do not need to possess a credible air force to counter the West's air superiority. Of particular concern for the US and the UK led coalition currently is the threat posed by man-portable SAMs, especially the SA-7, and there are fears that the insurgents are procuring double-digit SAMs. The increased rocket threat to the airport at Basra has recently caused the withdrawal of the Nimrod MR2 (an invaluable ISR asset) to a more secure location in the Middle East. However, time spent in transit is time not spent on patrol[27].



Figure 6. F-4 Phantoms over Vietnam.

Insurgents have also become adept at using the media to negate the impact of coalition air power (especially the way in which kinetic effect in urban areas is portrayed in the Middle Eastern media). So, although the coalition may possess air superiority, it is contested and therefore, so is the air power effect air superiority that it is supposed to facilitate. Unless the coalition's air forces can ensure freedom of manoeuvre, coalition objectives will not be met because air power is constrained. The act of withdrawing air assets to safer areas merely reinforces the notion that Iraq is a lost cause, at least the effort in the south of that country. This is where historical experience is instructive. During the Vietnam War, the communist forces (both Viet Cong and North Vietnamese Army regulars) came to understand that American air power was the key enabler and could be regarded as an operational *centre of gravity*, because of the requirement for Air Mobility and provision of timely firepower. During 1967 and especially during the Tet Offensive of 1968, the Viet Cong and NVA targeted American airfields as a matter of priority. In response, the US adopted a layered defence concept, whereby major airfields were protected by a defensive screen which extended out to 20-30 miles. So, just like historical COIN experiences, air power is the key enabler currently in Iraq and Afghanistan, and ensuring that it can perform to its full effect has to have priority. This is why the RAF Regiment is correct to resuscitate old style Survival to Operate (STO) concepts and practices seen during the cold war, and why the fitting of defensive aids suites on all operational aircraft is not a luxury, it is a critical requirement.

One of the best force multipliers for a cash-strapped RAF is appropriate and coherent doctrine. Until very recently, neither the RAF nor the USAF possessed meaningful COIN doctrine. The USAF hurriedly pushed through some 'reflections' on the subject in the early part of 2007, and then published its Irregular Warfare doctrine in August 2007[28]. Very little conceptual work was done in either country after the 1960s, and this was in spite of extensive experience gained in a variety of theatres, including Greece in 1944-45, Malaya between 1948 and 1960, and Vietnam. We must,

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necessarily, reflect on past practice in order to distil some vital universal lessons and compare these lessons with recent experience in Iraq and Afghanistan[29]. Convincing some in the Royal Air Force of the utility of history has not always been easy. Because of its technological nature, the Air environment has always tended to focus on the 'here and now' and the future, rather than drawing lessons from history. It is only within recent years that the Air Force has begun to take the 'Lessons' process seriously. Arguably, counter-insurgency warfare is one domain where we see the greatest number of similarities between the past and present, because it entails war among the people, and social, economic and political contexts tend to be broadly comparable. If we view a cross-section of historical COIN scenarios, a number of common themes emerge:

1. The need for a 'comprehensive approach' within an over-arching national strategy. This must include other government departments (OGD) and non-governmental organisations (NGOs), as well as all arms of the military instrument.
2. Air power is an important force multiplier, especially in theatres where a large footprint is not politically acceptable (either for the home audience or the target nation), nor necessarily affordable. But we must resist the temptation to think that air power can achieve victory in COIN single-handedly. Air power advocates must not over-promise only to (almost inevitably) under-deliver. This is a particularly important consideration in periods of extreme financial constraint, as we are in currently, because over-playing air power's effectiveness will be used as a weapon against the independent air force in funding debates.
3. The air power effect to have the greatest impact is usually tactical in support of land forces, rather than strategic. This is because the typical insurgency has a limited material base and is usually dependent on outside sources of supply, and is therefore difficult to coerce. The cell structure adopted by most insurgencies also usually precludes strategic level effect. However, this does not mean that air power should always be viewed as the supporting element, and that strategic effect air power does not occur in COIN scenarios. Strategic effect is achieved, for example, if key insurgents are neutralised, or when the air environment provides humanitarian relief.
4. Although the air power effect to have the greatest impact in COIN is usually tactical in support of Land forces, the notions of supported and supporting force elements can be divisive and misleading, especially in COIN scenarios. One of the principal features of successful COIN has been when joint commanders emphasised the unity of purpose, with no single Service environment being seen as the dominant partner. Some current Land commanders presume that air power is always a supporting element. Whether supported or supporting, it depends on the nature of the campaign and the point in which you find yourself in that campaign.
5. The key prerequisites for successful COIN are intelligence and timely response, and therefore air power plays a key role through air mobility and its ability to respond quickly, sometimes over considerable distances.
6. All air power effect targeting has to be precise, discriminating and proportionate. This is important both to avoid unnecessary and politically explosive collateral damage and to demonstrate to the insurgents that they cannot win.
7. Within the confines of OPSEC and national security, operational and strategic level objectives must be articulated carefully to the general public. This is particularly true of counter-insurgency warfare, as many of the objectives will not have immediate tangible results (i.e. 'hearts and minds' activity).
8. The measurement of effect must be thought through extremely carefully. Statistical analysis alone in COIN can be fatally misleading. Measurement of effort and performance are more easily achieved than measures of effect, but they are not substitutes for it. Ironically, however, most counter-insurgency warfare demands some level of attrition of the insurgency, especially against hard line insurgents. This has proved to be the classic conundrum of classic COIN: how to balance kinetic and non-kinetic effect, so that the objective is achieved without alienating the local population's consent.
9. Some of the most significant air power effect in COIN has been non-kinetic, in the form of 'shows of force' and humanitarian relief. As a COIN campaign progresses, reducing the amount of kinetic effect has often proved to be a useful way of garnering local support.
10. COIN is an inherently proactive business, which plays to air power's strengths. Victory in COIN has never been achieved by adopting a 'reinforced compound' and risk averse approach.

6.0 THE APPROPRIATE USE OF AIR POWER IN COIN

One of the most important questions to ask, as in any scenario: what is the most appropriate use of air power? In the past, those in command of air power capability have been too readily seduced by platforms and supporting technology, and have been overly focused on effort expended, rather than paying sufficient attention to effect. The Air environment has been particularly prone to the seduction of the 'numbers game': sorties flown, number of weapons employed, numbers of targets hit, etc., as measurements of success. The belief that greater success could be achieved simply through greater effort was very common during the first half of air power history. It was an understandable posture in a war of national survival, such as the Second World War, but counter-insurgency warfare demands that we think profoundly about effect. This was one of the most important lessons from the conflict in Vietnam. The American military doctrine of the early 1960s argued that if you equip and prepare for large scale conflict, small war scenarios (referred to generically as Low Intensity Conflict or LIC) can be dealt with by merely scaling down the existing force structure[30]. Vietnam not only compelled commanders to swing back and forth between countering both an insurgency and a regular threat to South Vietnam, but the military apparatus had to perform both kinetic and non-kinetic roles, often simultaneously within a single battlespace[31].

Performing kinetic and non-kinetic roles within the same battlespace required not only great operational and tactical flexibility but also a profound grasp of the complexities of such a war. Some parts of the US effort in Vietnam understood this complexity and proved to be extremely successful, as the communists themselves admitted later. Of particular note was the development of the US Marine Corps Combined Action Platoon concept, whereby a USMC unit would secure a village and stay with that village for a longer than usual tour, building up trust with the locals through providing security and aid. Air power was employed flexibly in support of the USMC 'ink blot' strategy, swinging from close air support against Viet Cong guerrillas and North Vietnamese Regulars to humanitarian support and reconstruction, all within the same battle zone. USMC doctrine showed an appreciation of what we would describe today as a 'comprehensive approach'. Although the US government failed to articulate clearly an over-arching national strategy for victory in Vietnam, some elements of the effort, like the USMC, grasped the importance of a cross-governmental strategy. However, most American activity in Vietnam was rigidly stovepiped, and although operational excellence was achieved, notably in areas such as air mobility, close air support (both USAF and USMC) and intelligence led pacification[32], there were no mechanisms, either in theatre or back in Washington, for pulling together the various strands. This is why the Americans lost in Vietnam, hence the

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immense frustration felt to this day among military and civilian veterans of that conflict[33].

One of the most important doctrinal conclusions that we can take away from the war in Vietnam is that it is dangerous to stovepipe the levels of war, and that we must guard against being too satisfied with operational or tactical level success. Britain has come perilously close to falling into this trap. After a decade of peace support style activity in the 1990s, there was a great desire, particularly within the Army, to get back to what was described as 'real soldiering'. The success achieved in the main combat phase of Op TELIC (spring 2003) reinforced a focus on the operational level of war and kinetic effect, and made a physical and psychological transition to Phase IV type of activity extremely difficult. This was in spite of numerous intelligence warnings of a probable insurgency if we failed to devote sufficient attention to the remnants of the Iraqi Army and Saddam's internal security apparatus in the post-conflict stage[34]. Over twenty-five years ago, Sir Michael Howard wrote that wars are not tactical exercises on a larger scale, and that victory is often not defined on the battlefield itself but in political, social or economic factors[35].

A reluctance to engage in nation building in Iraq was seen among both the US and British military establishments, but a desire to prosecute a quick, clean war was also driven by the politicians. This is almost a universal truism; unless it is a war of national survival, politicians will be interested in a 'quick, decisive victory' and an equally rapid withdrawal. They will also be concerned about limiting the footprint in a particular theatre, for mainly political but also financial reasons, and this is why air power has become one of the favoured instruments in wars of choice. Since our earliest experiences of counter-insurgency warfare against a communist enemy, air power provided vital force multiplier effects. In a number of cases, it can be argued that air power played the dominant and decisive role. For example, when Britain intervened in what is generally considered to be the second round of the Greek Civil War between 1944 and 1945, there was a reluctance to commit already overstretched Land forces from the Italian campaign, and an initial deployment of Brigade size was all that could be spared. This force was quickly surrounded by insurgents in Athens, and Air re-supply was the only means of sustaining the British effort during December 1944, until reinforcements arrived. In the meantime, RAF aircraft and their crews proved their flexibility by switching between Air Interdiction missions to urban close air support. Not only was this flexibility impressive, but the urban CAS was, by the Army's admission, the principal reason for the insurgents' defeat. It was also acknowledged that the initial Air re-supply operation and use of transport aircraft to drop reinforcements played a vital role, and the Army was effusive in its praise of RAF efforts to support the Land environment. Further, air resupply helped to feed the local Greeks, and this proved to be a major 'hearts and minds' coup for the British forces. It is often said that only 'boots on the ground' can have a 'hearts and minds' impact. The Greek example proves otherwise, and it is an important observation. Air power came to be associated with deliverance, with local Greeks referring to the RAF as the 'winged saviour', because air power provided day to day security against the insurgents and also fed them. Therefore, air power had a strategic impact in this particular COIN scenario[36].

Another important observation to be made about the experience in the Greek campaign was that although there was a very good case to be made for air power being the decisive Service element, the senior commanders in theatre regarded the task as a joint effort. There was no suggestion of supported or supporting elements; just one fight and one plan. Recent campaigning in Afghanistan has been divisive because Land has not seen the Air Force as an equal partner, possibly because the fighting has been tougher than anticipated, and the unity of purpose has been lost sight of as a result. Once again, this has been exacerbated by the lack of strategic direction from the top, and also a lack of a Joint HQ[37].



Figure 7. A-10 over Afghanistan.

7.0 THE LIMITS OF AIR POWER

The Greek example demonstrates the utility of air power as a force multiplier when there are operational constraints on the size of force to be employed. An ideal example of air power being employed as a means of limiting a footprint in a particular theatre for political reasons is found during the first phase of the Vietnam War. Justifiable fears over the escalation of this conflict to include both the Chinese and the Soviets meant that President Kennedy wanted to limit American involvement to an 'advisory' capacity and advocated an expanded Special Forces employment as the way to deal with the insurgency in South Vietnam[37]. His successor, President Johnson, wished to pursue the same policy of limited commitment, and was quick to reach for a coercive air campaign as a means of stopping North Vietnam's support to the southern insurgency. Between 1965 and 1968, the US employed the 'Rolling Thunder' bombing campaign against North Vietnam. The campaign failed, for a variety of reasons discussed below, but this is by no means the only example of a politician being seduced by air power potentially as a war winner by itself. President Clinton expressed the same logic in the lead up to the Kosovo Conflict, initially announcing that air power alone was going to be employed to coerce the Serbian leadership. This proved to be a serious error, as the absence of a Land threat allowed the Serbian forces in Kosovo to disperse and hide. As a result, considerable NATO Air effort achieved relatively little attrition, and Milosevic judged that Serbia could absorb such punishment indefinitely. Only the withdrawal of Russian political support and the possibility of NATO Land action forced capitulation.

Only very occasionally has air power been decisive almost single-handedly. There were instances of this during Britain's empire policing experience in the Middle East and on the north-west frontier of India during the 1920s and 1930s. During that period, air power had a much greater shock impact on target populations, simply because aircraft had never been seen before by most of the people under attack. In almost all instances of counter-insurgency warfare, Land force has been required to deal decisively with insurgents and to provide ongoing security, as well as engaging in 'hearts and minds' activity. Therefore, as a general rule, the air power effect to have the greatest impact in COIN is tactical, rather than strategic, effect. This is also true because the typical insurgency has a limited material base and is dependent on outside or cross-border sources of supply, and is, therefore, difficult to coerce. The cell structure adopted by most insurgencies also precludes strategic level effect, unless it is possible to target an insurgency's leadership, or if a strong link between an insurgency and a state sponsor can be identified, in which case it may be possible to attack that state sponsor. However, political constraints are usually such that the latter option occurs only rarely. The best

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historical case of a state sponsor being attacked occurred in 1986, with the US attack on Gaddafi's Libya. Gaddafi had been the principal state sponsor of the Abu Nidal terrorist group, which had perpetrated a number of bombing attacks against US personnel and interests in Europe. It can be said that *Op El Dorado Canyon* had an important strategic effect, by creating a more compliant Gaddafi, but the main objective, limiting the power of the Abu Nidal group, was not achieved. The terrorist bombings stopped for a six to eight month period, but the organisation came back even stronger than before because the act of forcing the group underground made it more, not less, resilient[39].

As the Americans, and the French before them, found in south-east Asia, understanding the essential nature of an enemy and all his support mechanisms is key to crafting the appropriate strategy or strategies for victory. The French understood their adversary profoundly and came very close to succeeding; only the loss of political will prevented ultimate French victory in Indochina. The Americans, however, had great difficulty understanding the true nature of their adversary in Vietnam, and this meant that the military strategies they employed initially in Vietnam were destined to fail to a greater or lesser extent. This was seen most graphically in the first strategic bombing campaign applied in Vietnam between 1965 and 1968: Operation Rolling Thunder.

One of the most serious mistakes was to under-estimate the will and tenacity of the communist foe, and the lessons for the current 'war on terrorism' are substantial. The communists had been prepared to sacrifice tens of thousands of people in their fight against the French only a decade earlier, and they were prepared to do exactly the same all over again against the Americans. In short, this highly motivated enemy was not going to be easily coerced. Further, because North Vietnam possessed only a handful of industries and was almost entirely dependent on outside sources of supply, any physical damage done to the country was going to have only limited leverage over the North Vietnamese leadership. If this were not bad enough, these outside suppliers, notably the Chinese and the Soviets, could not be touched because of fears over escalating the war. Therefore, the political constraints on the operation were severe. For example, there was a fifty mile deep buffer zone on the border with China into which American aircraft could not fly, even when North Vietnamese aircraft were using China as a sanctuary. Haiphong harbour was off limits because of the presence of Soviet shipping, and no SAM sites could be attacked unless they were shown to be operational, i.e. SAMs had to be fired from them first because Soviet technicians were involved in setting up these sites and President Johnson wanted to avoid at all costs any casualties among Soviet personnel in theatre. A three year coercive campaign failed to stop the North Vietnamese support to and control of the insurgency in the South, and it cost the Americans over 800 aircrew and 990 aircraft[40].

The ability to address the insurgency at grass roots level as well as simultaneously acknowledging a conventional, main force threat, was the key to success in south-east Asia. The French understood this, and almost succeeded in the Indochina war; the Americans came to realise this belatedly, and tried to readjust their approach in 1967 (by which time it was too late because the communist Tet Offensive the following year undermined US political will to see the conflict through to the end). In both wars, the key to victory was defeating the insurgency and main force threat in detail, whether through kinetic effect or non-kinetic measures, including intelligence led arrests. The communist approach was not so much 'asymmetric' (an over-used and often misused term) as broad spectrum, although the Americans found the insurgent element the most challenging. A fatal mistake made during the Kennedy presidency was to argue that, in this 'new kind of war', ORBAT analysis was no longer applicable. A focus primarily on the insurgency in the South blinded analysts to the threat posed by the communist regulars, and the Tet offensive of 1968 proved that the Americans had fundamentally misunderstood the essential nature of this conflict: that the communist insurgency was controlled by the North, that the regime in the North always regarded the general offensive as the ultimate war winner, and that the most capable Viet Cong guerrilla units were indistinguishable from North Vietnamese Army units. Had the Americans possessed greater granularity through ORBAT analysis, they would have had a better understanding of the time, place and scale of the communist attack in 1968. This was an offensive the Americans and their South Vietnamese allies could have beaten decisively. Whenever the Americans engaged with the North Vietnamese Army and the more capable Viet Cong guerrilla units, they won every time. The conclusion that must be drawn from the Vietnam experience is that the defeat of the communist fielded forces was important, especially as the communist doctrine emphasised the regular army as the main engine of the war. Therefore, the most valuable type of air power effect was seen in support of land forces: air interdiction, close air support and air mobility. The same is true today. The ability to defeat insurgent groups in detail, using responsive air power, is one of the keys to ultimate success[41].

8.0 INTELLIGENCE AND TARGETING

Another important lesson for us from almost any historical COIN experience is that specific intelligence understanding of an enemy allows for timely and precise targeting of the threat. This is especially important if you are to gain the initiative, and any counter-insurgency effort should be proactive and forward leaning. One of the problems encountered by the Americans in Vietnam was that they were almost always reactive in the field. This was because their intelligence lacked the granularity sufficient to build up a daily ORBAT[42] of enemy dispositions, and HUMINT[43] penetration of the communist forces was rarely good enough to give clues about intent. As a result, the application of firepower in Vietnam was often indiscriminate and inappropriate. During many of the 'search and destroy' missions of 1966-67, whole villages could be targeted merely if they were suspected as Viet Cong strongholds. This method of clearing communist influence negated all the 'hearts and minds' work done, often within the same district, sometimes in adjacent villages. The weapons chosen also caused unnecessary suffering; napalm and phosphorus bombs were used because of their destructive power, aiming to destroy and deny infrastructure to the Viet Cong, but these weapons resulted in horrific injuries to those people caught in the attacks[44].

In contrast, during the British intervention in Greece in 1944-45, intelligence feed was both timely and almost always accurate. HUMINT, provided by the locals, was used to discriminate between insurgent forces and the civilian populace in Athens, and co-operation between the troops on the ground and the aircrews was such that insurgent positions could be targeted within 3 minutes of call up. This was because aircraft were being held on combat air patrol (CAP) in 'cab ranks' over the city. Post-war analysis showed that the level of collateral damage was kept to a bare minimum, and this was one of the reasons why the communist insurgents lost support among the general populace. British activity was shown to be proportionate and precise, whereas the communists were increasingly indiscriminate in their targeting of 'enemies' within the civilian populace. This was a major 'information operations' coup for the British forces in Greece, because not only was it their stated policy to avoid unnecessary collateral damage, but they were true to their word. A great deal of thought was devoted to the appropriate type of weapon for the urban context. It was realised that weapons had to have sufficient but not excessive destructive effect, and this is just one of the many lessons being relearned in current theatres of operation. The performance of the RAF in 1944-45 is remarkable, for a number of reasons. Not only were the aircrews inexperienced in urban close air support when they were swung from Air Interdiction to this role, but the fact that the urban terrain usually negates the main strengths of air power. A mix of tall and short buildings interfered with weapon flight paths and communications, and the low level attack profiles of the aircraft put them at high risk because of insurgent AAA and snipers[45].

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9.0 ACHIEVING EFFECT IN COIN

As the RAF found in Greece in 1944-45, there was another benefit of being precise in targeting. An important conclusion drawn was that a certain amount of kinetic force had to be performed against insurgent positions in order to demonstrate resolve and capability, and to make the insurgents realise that they could not win. The heaviest air attacks on insurgent strongholds in Athens occurred during December 1944 and the first week of January 1945. Because aircraft (mainly rocket and cannon equipped Spitfires and Beaufighters) were held in 'cab ranks' above Athens, some of the attacks were relentless, with a succession of aircraft hitting the same building or position. What the RAF crews found by the beginning of January 1945 was that insurgents would often give themselves up on the mere appearance of aircraft. So, by the end of the crisis, it was not uncommon to see insurgents fleeing from their positions, abandoning significant amounts of weaponry, just through what we would call today 'shows of force' by the squadrons concerned. This usually entailed no more than a low level pass over buildings. This historical experience parallels that in Iraq since 2003. The precision and destructive power of fixed wing close air support, including CAS delivered by AC-130 gunships, and attack helicopters has frustrated the insurgents' ability to dominate and utilise the battle-space. There have been repeated reports of insurgents dispersing and abandoning positions on the mere appearance of coalition aircraft, especially fast jet, A-10 and AC-130 gunships. The Iraq 'lessons identified' process has also highlighted the requirement for timely and precise intelligence feed, precise targeting and the need to limit collateral damage[46].

The ability to achieve the desired effect with purely 'shows of force' has always been important in COIN scenarios, but is particularly important in today's strategic environment. The problem is that air power can now deliver unprecedented levels of lethality and destructive effect, and for the general public, physical effects are almost always viewed as 'disproportionate', especially in the urban setting. This perception is amplified by the nature of today's media coverage of events; brief 'sound bites' rarely portray kinetic effect within a wider context of military and other activity within a theatre. 'Hearts and minds' success stories and examples of non-kinetic Air effect are rarely portrayed, especially in the broadcast media[47]. This is why, within the confines of OPSEC and national security, it is so important for senior commanders to articulate intent and measures of effect in public forum. For obvious reasons, this needs to be thought through extremely carefully, but in the absence of our own information Ooperations campaign, the media will typically play into the hands of the opponent. Since 2003, both the US and Britain have paid insufficient attention to how physical destruction of buildings, especially houses, in Iraq and Afghanistan is portrayed by Arab speaking media. The same can be said of Israel in 2006, when it was attacking Hezbollah targets in the Lebanon, although some may say that the Israelis have never been overly concerned about justifying their actions to the international community, as they see any threat as a war of national survival. However, it is interesting to note that Israel has subsequently emphasised the utility of the helicopter in urban COIN because of this experience. Their latest air power COIN doctrine cautions against use of fixed wing (especially fast-jet) aviation in the urban context[48].

10.0 MEASURING EFFECT IN COIN

Choosing appropriate measures of effect in counter-insurgency warfare has always been vital, but has been one of the most problematic areas. COIN experiences which were adjacent to the Second World War were, almost inevitably, influenced by doctrines of attrition and firepower, and statistical analysis. This was compounded in many instances where precise intelligence was lacking. The early British experience in Malaya, for example, saw the employment of heavy bombers against the communist insurgents. Lincoln crews bombed through the jungle, aiming at suspected insurgent positions. In the absence often of specific intelligence, especially in the period 1948-1952, such missions were undertaken in order to demonstrate that something was being done, but it was a case of activity being confused with achievement. Like French Indochina and Vietnam, the most important air power effect was to be found in support of the land environment, especially in the areas of forward air control and air transport, which provided essential resupply for Land forces operating in difficult terrain[49].

In Vietnam, the application of air power was dominated by the use of massive firepower. During major coercive air campaigns (*Rolling Thunder* and *Linebacker I&II*) against North Vietnam, the US dropped more than three times the total Allied bomb tonnage employed in World War 2. For many, especially individuals like Curtis Le May (former Commander of the USAAF Eighth Air Force, Commander of Strategic Air Command and latterly USAF Chief), this equated with 'inevitable effect'. The USAF, in particular, was seduced by statistical analysis, and its Office of Statistical Analysis, which had its origins in World War 2, engaged in detailed surveys of fighter-bomber and heavy bomber sorties, tonnages of aerial munitions employed, distribution of munition tonnages across the theatre, computations of tonnages per sortie, etc[50]. This statistical focus was exacerbated by USAF-US Navy rivalry at the time of the Rolling Thunder air campaign. As the former Commandant of the US Marine Corps, General Shoup, noted:

> *"…the Navy carrier people and the Air Force initiated a contest of comparative strikes, sorties, tonnages dropped, 'killed by air' claims, and target grabbing which continued up to the 1968 bombing pause. Much of the reporting on air action has consisted of misleading data or propaganda to serve Air Force and Navy purposes…"*[51]

Any prospect of understanding what was actually being achieved was hindered further by the way in which targets were classified. Claims of effect were often exaggerated because of the inappropriate labels attached to some targets. For example, houses destroyed in villages were often recorded as 'military structures' simply because the Viet Cong was based in the area, a sampan became a 'waterborne logistics craft', a farmer's 44 gallon drum became a 'POL location', etc. When such jargon entered into intelligence assessments, it gave a dangerously skewed picture of effect.

A consistent theme in COIN campaigns is the psychological impact of air power, but this is the most problematic area of effects measurement. The coercive impact of 'shows of force' in COIN, especially after demonstrations of kinetic effect, is undisputed, but it is not easily subjected to quantitative or other types of measurement. Nor has the morale impact on friendly forces of one's own air power been considered in sufficient depth. As in past COIN campaigns, the boost to morale provided by low flying, loud, fast jet aviation should not be under-estimated.

11.0 AIR POWER INNOVATION IN COIN

Because counter-insurgency warfare is an inherently proactive business, it plays to air power's strengths of speed, range and flexibility. These attributes are enhanced further, because technological advances allow platforms to be swung from one role to another quickly. As long as this is not taken too far, because multi-role platforms always have aircrew training implications, this makes air power a very potent and cost effective tool in COIN scenarios. A platform can be performing kinetic effect one minute, then be re-tasked to carry out 'shows of force' or 'reassurance' the next. The difficulty in some historical and, indeed, current counter-insurgency experiences has been to convince senior commanders (and politicians) that COIN must be forward leaning. No insurgency was ever beaten by adopting a 'reinforced compound' and risk averse

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posture. While this is understandable if manpower shortages are acute, static postures always invite attack and defeat. This was seen very graphically during the first years of the war in Indochina, especially 1950. The French possessed less than half of the manpower they calculated to be necessary to defeat the growing Viet Minh threat, and so adopted a heavily defensive strategy by building a series of fixed strong points to protect the Tonkin Delta, which they regarded as their *centre of gravity* in northern Indochina. In 1950, a number of these strong points protecting an arterial road adjacent to the Chinese frontier (known as the RC4) were attacked by the Viet Minh, and fell like dominoes. This early defeat in Indochina proved to be fatal ultimately for the French, because they lost control over the border region. A rigorous French 'lessons learned' process later identified mobility as key to success in COIN, with particular emphasis on air power and intelligence led targeting. The French concluded that had they stood their ground, with the aid of aerial reinforcement, then they could have won[52].

An extremely important point to be gleaned from the French experience in Indochina and most COIN scenarios is that unless Land forces are of a critical size and capability, they must expend a substantial percentage of their effort protecting themselves before they can venture out to do business. air power can provide a solution either through reinforcement or increasing the mobility of those land forces. The French also emphasised the value of aerial reconnaissance, and another important conclusion drawn was that persistent air reconnaissance can monitor insurgents over long periods, allowing Land forces to plan operations against known patterns of behaviour. Once regular patterns in force employment were identified, then the enemy's forces could be surprised and beaten. One of the particular failings of this and other communist insurgencies is that the communists were prone to template planning. Having found what they felt was a good formula for success, they tended to apply it on every occasion[53].

In contrast to the later American period in South-East Asia, the French did not possess the latest aircraft and supporting technologies. What is impressive about their employment of air power is the fact that they thought innovatively about the platforms they had (which were war-weary former German aircraft, such as the Ju52, and American fighter-bombers and bombers, including the Bearcat, Corsair and B-26). Like the British experience in Malaya, these aircraft were utilised first in the standard roles, including strategic bombing, but the French quickly developed new operational concepts to suit the terrain and nature of the war. Contrary to the accepted wisdom, it was the French, and not the Americans, who first thought about using helicopters as troop transports and as attack platforms[54]. The climate and geography of South-East Asia precluded the easy application of land based firepower and infantry manoeuvre, so air power was quickly recognised to be a vital means of providing effect in a timely fashion.

Historically, the RAF has also had a proud tradition of thinking innovatively about how to make best use of legacy aircraft or apparently inappropriate equipment in new operational concepts. During the intervention in Greece in 1944-45, for example, the RAF employed Leigh Light equipped Wellingtons, normally used by Coastal Command in an anti-submarine role, to illuminate urban targets at night for close air support of land forces[55]. There are a great many parallels with historical experience and our position today, where we find ourselves having to operate with legacy platforms and inadequate doctrine. Financial constraints and a rapidly changing strategic environment make procurement decisions extremely difficult. Therefore, we have to think harder about how we use existing capabilities. There is a current parallel to the Leigh Light innovation in 1944. RAF Nimrod MR2 maritime patrol aircraft are now being used for overland surveillance, and an urgent operational requirement for more optical coverage and reconnaissance of the battlespace has been identified[56].

CONCLUSION

One of the most serious problems facing UK defence since the end of the cold war has been the lack of a strategic perspective, which has compelled all the Services down a short-termist and 'hand to mouth' approach to conflict management. A strategic perspective helps us to think hard about defence priorities, and this is vital in an age when affordability is a key issue.

In establishing a solid base for itself for the future, the RAF must avoid over-stating its capability. It must be clear as to what it cannot do, for reasons of capability shortfall or political constraint. However, some of the current problems being faced by British air power, especially the RAF, stem from the failure in the past to articulate clearly and robustly as to why certain capabilities are necessary and what air power can do, across the full spectrum of defence related activity. Air power provides incredible value for money through its force multiplier effects, often playing a dominant and decisive (and not merely supporting) role in a joint context, and performing occasional independent action. A survey of past and current counter-insurgency experience demonstrates that air power plays a particularly important role, as it can meet the requirement for both kinetic and non-kinetic effect. It can be argued that air power is the key enabler in COIN.

However, viable air power must also be seen as the country's best insurance policy for the future, against state threats to our national security, whether this entails provision for adequate air defence or the ability to achieve strategic effect at long range. In order to achieve broad spectrum air capability, Britain will be particularly reliant on the US, but she will also need to pursue more collaborative programmes with European partners. If air power is to be affordable, these are the only routes Britain can adopt for the future. If Britain wants to be considered a serious medium power, wanting her voice to be heard and have influence in international fora, she needs to maintain a full spectrum of capability, from PSO and COIN through to high end warfighting. Even in the most financially constrained times, especially in the decade following the Second World War, Britain succeeded in training for World War III, while concurrently meeting a variety of small war and COIN challenges. The argument that we must train and equip for one or the other type of scenario is deeply unsound and dangerous.

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