2000

Is there a Role for Air Power in the Post-Cold War World?

This paper was first published in *The RAF Air Power Review* Vol 4 No 3 (Autumn 2001) and is reproduced here in its original form. It was awarded first place in the Gordon Shephard Memorial Prize essay competition for 2001.

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Contemporary Introduction 2022

This essay was written as part of my Masters course in International Relations at the University of Birmingham in 2000 - 2001. It is extremely timely that it should be reprinted now with the war in Ukraine ongoing, leading to the bolstering of NATO defences across the eastern most states of the Alliance in response to continued Russian aggression, including the deployment of British forces to the Baltic States. Thus, we could potentially stand at the precipice of a new Cold War between NATO and Russia. Nevertheless, between writing this essay and now, air power has been in much demand, such as in the conflicts in Afghanistan, Iraq, Syria, and Libya, which has emphasised both the key role that air power can play in conflicts, but also some of its limitations as set out in this essay. This essay was written in the months before the 9/11 attacks, including on the World Trade Centre, and the subsequent invasions of Afghanistan and Iraq, which emphasised the role of air power in defeating fielded forces, as well as the challenges in combating insurgencies undertaken by non-state actors. While air power has increased its capability of destroying mobile targets, particularly through the use of RPASs, there are still significant limitations on what it can achieve. In addition, the UK Parliament's decision not to deploy military troops to Syria in 2013, highlights the continued importance of political will to put boots on the ground. Thus, demonstrating the continued importance of air power, which was used to target Daesh in both Syria and Iraq. No doubt, air power will continue to develop its capabilities over the coming decades especially with the F-35 Lightning II being deployed on the new aircraft carriers, and it will retain its prominent role in delivering political will across the globe.

Introduction

Air power has a significant role to play in the post-Cold War era. Since the end of the Cold War there has been a transformation of the international security environment resulting in an increase in limited-intensity regional conflicts. Furthermore, politicians, increasingly constrained by media-fuelled public opinion, and moral and financial considerations, attempt to demonstrate resolve and commitment to operations while minimising the risk of casualties on either side. The ability of air power to utilise its inherent strengths of height, speed and reach offers politicians a highly visible presence, relative invulnerability, and increased accuracy through the use of Precision Guided Munitions (PGMs). Consequently, air power has played an increasing role in limited-intensity conflicts, culminating in the sole use of air power by the North Atlantic Treaty Organisation (NATO) during Operation *Allied Force*.[1] Nevertheless, the efficacy of air power to undertake strategic bombing within combat operations and Peace Support Operations (PSOs) has been questioned. Analysis of Operations *Desert Storm*[2] and *Allied Force* has shown that while air power is very effective in destroying static targets, it is less destructive against mobile targets. Additionally, while air power has successfully undertaken roles within PSOs, land forces are still required to carry out the full range of tasks in these operations.

Air power is a concept that has historically proven difficult to define. Winston Churchill emphasised this point, arguing that, 'air power is the most difficult of military forces to measure

or even express in precise terms'.[3] Consequently, initial attempts to define air power were vague. Marshal of the Royal Air Force Sir John Slessor remarked in the 1950s that 'air power is a compound of Air Forces and all those things on which Air Forces directly or indirectly depend, such as a flourishing aircraft industry and civilian aviation, a good meteorological service, secure fuel supplies and so on'.[4] While the Royal Air Force concept of air power has broadened over time in line with technological developments to include air vehicles from all sectors of the armed forces, including unmanned air vehicles (UAVs) and space-based systems, it has become more focused in terms of peripheral elements. National civilian and commercial resources, for example, are still included, but only those that are used as part of a military operation, whereas the aviation industry has been excluded. Furthermore, the current concept of air power encompasses a wide variety of tasks from high profile combat missions to Combat Support Operations such as Intelligence Surveillance and Reconnaissance (ISR), air transport, search and rescue, and electronic warfare.

> *'Air power is the ability to project military force in air or in space by or from a platform or missile operating above the surface of the earth. Air platforms are defined as any aircraft, helicopter or unmanned air vehicle'.* [5]

This broadly acceptable definition will provide the basis for this paper.

The role of air power in the post-Cold War world is determined by its inherent strengths and weaknesses, leading it to make an extremely useful contribution in particular political circumstances. The British air power doctrine manual, *AP 3000*, regards height, speed and reach to be air power's three main strengths.[6] Height confers to air assets not only an 'enhanced observation and perspective of the battlespace',[7] but also considerable manoeuvrability. Speed allows rapid deployment and also bestows enhanced survivability by reducing exposure to enemy forces. Reach, assisted by air-to-air refuelling, allows force projection to all parts of the earth, unconstrained by topographical obstacles.

From these strengths five characteristics are derived, that enable air power to make a major contribution to modern peace support and combat operations: pace and tempo, flexibility and versatility, penetration, perspective, poise and stand-off and ubiquity of space.[8] Pace and tempo are comprised of three elements: speed of decision, speed of execution, and speed of transition, facilitating the re-deployment of air power at short notice. Flexibility and versatility allow air vehicles to strike various specialist target sets during a single mission. Penetration allows air power to strike targets within the enemy homeland without first defeating its fielded military forces. Perspective is derived from capitalising upon height and reach, permitting a broad view of the battlespace from the air, essential for intelligence gathering. Poise and stand-off allow air vehicles to loiter in close proximity to a potential area of operations, while the ubiquity of space coupled with modern technology enables space-based assets to be pervasive.

AP 3000 also identifies three main limitations of air power: impermanence, limited payload and fragility.[9] Impermanence is derived from the inability of air vehicles to stay airborne indefinitely. The Balkan conflicts of the 1990s highlighted the ability of land forces to hide in woods, civilian buildings and bunkers during air attacks, then re-emerge to continue their operations. Air power is unable to exert continual force upon enemy troops denying them control of their own actions without friendly troops physically to occupy territory. In essence, air power's inability to occupy territory means it cannot control territory permanently. Air vehicles are constrained by the number of weapons stations they possess and by aerodynamic considerations. The effect of this limitation, however, has diminished with the increased accuracy offered by PGMs, as fewer munitions are required. Modern air vehicles are also fragile pieces of equipment that are vulnerable to sophisticated air defence systems, particularly surface-to-air missiles. Nevertheless, the vulnerability of air vehicles can be reduced by utilising speed alongside self-protection devices.

These unique characteristics made it possible for air power to take advantage of the changes in the global political climate, thus assuming a larger role in the post-Cold War world. The end of the Cold War transformed the international security environment with important implications for the possibility and nature of external military involvement. The Cold War provided the stark simplicity of confrontation between the superpowers and their allies. Without the external constraints imposed by their superpower relationships, ethnic disputes previously contained have come to the fore, prompting a marked increase in limited-intensity regional conflicts. High and medium-intensity military interventions by western democracies are often both unnecessary by traditional standards and unpopular. On occasion, however, such intervention may be deemed to be beneficial to national interests; for example, securing cheap Middle Eastern oil supplies was a major motivation for many who participated in the Persian Gulf War.[10] Unless national interests are at stake, however, national governments are unlikely to be deeply committed to military interventions that are usually prompted by either moral outrage or a fear of instability spreading throughout a region. Similarly, media interpretation and influence, together with moral and financial considerations, has reduced the willingness of the electorate to support military intervention. Without a threat to national security or prestige, electorates are perceived to be less happy about servicemen dying – or killing. Public opinion fuelled by media images, for example, not only influenced the decision of President Bush to launch Operation *Restore Hope* in Somalia[11] in 1992, but also forced President Clinton to withdraw all military forces in 1993, after the execution of US servicemen in Mogadishu which caused domestic public outcry. The US is now reluctant to commit ground troops to any military intervention, in an attempt to avoid such a repetition. This unwillingness to commit ground forces was highlighted during the Kosovo conflict in 1999, when President Clinton ruled out utilising ground forces, in order to retain public support for intervention. Additionally, western democracies since the end of the Cold War wish to realise the 'peace dividend'; consequently military spending – either for equipment or for expensive deployments abroad – has fallen further down the list of national priorities.

Should a government wish to contemplate military intervention, it thus has the task of convincing a sceptical electorate, without the aid of Cold War rhetoric for justification. Intervention in the limited-intensity conflicts mentioned above has generally been multinational. Such operations are preferable to unilateral intervention as they offer burden-sharing in terms of finances, equipment, and lives, thus making it is easier for politicians to enlist the support of their electorates. Nevertheless, within these operations agreement must be reached between a number of contributors, each of which requires their own domestic support. Organisations such as NATO require operations to be sanctioned by all member states before they can go ahead, forcing a compromise to accommodate those states that are more reticent towards military action. Also, once an intervention is undertaken it is necessary to get results before the coalition crumbles. The need for consensus therefore forces organisations to take fewer risks, and seek to achieve objectives quicker than would be the case if a nation were acting alone. Consequently, military intervention must now be as cheap as possible, and almost completely bloodless, as well as quick and decisive in order to gain results before support wanes.

Within the bounds of such limitations air power is very attractive to politicians, as it offers a highly visible presence, relative invulnerability when compared with ground forces, the ability to escalate and reduce the scale of military action quickly and easily, while indicating commitment to the operation. Moreover, the development of PGMs has resulted in air power offering increased accuracy and 'effects-based' targeting, thereby reducing the number of enemy casualties and the level of destruction required to achieve the campaign objective. Firstly, the rapid arrival of air assets in the area of operations provides a highly visible symbol of presence and resolve to antagonists and onlookers abroad and at home. Within 24 hours of the Iraqi invasion of Kuwait in 1991, Coalition air power was patrolling the Iraqi border with Saudi Arabia, hindering any further southward expansion by Iraq and reassuring neighbouring Arab states. This rapid deployment reported by the media emphasised Coalition commitment to the electorate at home, the Iraqi leadership and Saudi Arabia.

Secondly, air power is less vulnerable to enemy fire when compared with ground forces, and thus is attractive to politicians who wish to keep friendly casualties to a minimum. During situations where there may be a limited political commitment to an operation, aircraft can operate from secure bases beyond the reach of the opponents' military forces. Air power further reduces the number of friendly casualties by reducing the amount of manpower required for military interventions. While Britain offered to commit 54,000 troops to the proposed Kosovo ground force operation,[12] this figure is over ten times the number of British aircrew that participated in Operation *Allied Force*.[13] Additionally, combat aircraft can operate successfully, although with less weapons accuracy, beyond the range of the majority of surface-to-air missile systems and anti-aircraft artillery, reducing their vulnerability even further. During Operation *Allied Force* 10,484 strike missions were flown with the loss of only two aircraft and no lives,[14] an unprecedented achievement from a military standpoint

which meant that it was easier for the governments involved to retain public support for the intervention.

The third attribute that makes air power politically attractive is its ability to utilise PGMs. Since the end of the Cold War, PGMs have become more prominent because of the increased accuracy they offer. PGMs confer to air power the ability to identify and destroy very small targets with only a small risk of catastrophic deviance from the designated point of impact:

> *'In 1945, 3,024 aircraft with an average delivery error of 3,300 feet were required to hit a 60 x 100 feet target; by the Vietnam War the number had reduced to 44 aircraft, and by the Gulf War only eight aircraft were required.'*[15]

The Gulf War prompted claims that PGMs provided air power with a 'surgical strike' capability with only one bomb needed to destroy a target. Although this claim proved ultimately to be false, by the end of Operation *Deliberate Force*,[16] less than two PGMs were required to destroy each designated point of impact.[17] This improved accuracy decreases the chances of PGMs hitting the wrong target and causing collateral damage.[18] As Western democracies are highly sensitive to media images of collateral damage, these images have the potential to weaken electorate support for an operation, even to the point of causing its premature cessation. Additionally, an opponent will undoubtedly highlight instances of collateral damage, in an attempt to discredit the interventionist's operations with observers and other coalition members. During the Gulf War, for example, Iraqi leader Saddam Hussein permitted the world's media unrestricted access only to bomb sites involving collateral damage. By decreasing collateral damage, PGMs assist in maintaining public support for an operation, without which national governments would find it extremely difficult to sustain such actions.

Moreover, the unprecedented accuracy that these weapons offer enables air vehicles to carry out 'effects-based' targeting, through which it is possible to pre-determine the level of destruction that is caused. Politicians thus seek to deny the enemy use of their facilities without having to destroy them completely. The ability to engage in 'effects-based' targeting, therefore, is an important attribute in view of the cost of rebuilding a nation's infrastructure and facilities after the end of a conflict. It is possible, for example, to disable a power station by destroying only its water pumping station, an effective but inexpensive procedure in terms of risk to aircrew and post-conflict reparation.

The last major advantage that PGMs confer to air vehicles, is the ability to attack several targets concurrently, something not possible with 'dumb' bombs.[19] Thus, it has been argued that PGMs enable air power to concentrate force at many desired points simultaneously,[20] allowing more targets to be destroyed in a shorter period of time than was previously possible. During the first night of Operation *Allied Force*, 44 key targets were destroyed within Belgrade, a level of destruction that could not have been achieved without the use of PGMs.[21] Consequently, PGMs allow operations to be completed relatively quickly, with the length of conflicts now calculated

in days rather than months and years. The future development of PGMs will lead to air power playing an increased role within limited-intensity conflicts. Relatively inexpensive guidance systems will confer a day and night, all weather precision capability to a large amount of 'dumb bombs', thereby enhancing the capabilities of current weapons in a cost-effective manner.[22] Also, the procurement of long-range air launched cruise missiles, such as Stormshadow, will decrease aircraft and crew vulnerability further by increasing the stand-off potential of air power.

Finally, air power is inherently flexible, allowing action to be suspended and activated, and also escalated and decreased in accordance with the diplomatic process. During Operation *Deliberate Force*, NATO bombing of the Bosnian Serbs was paused to allow them to remove their heavy weaponry from the Sarajevo demilitarised zone. After the Bosnian Serbs failed to comply with NATO instructions bombing was reconvened. Moreover, air assets can be extracted from their foreign operating bases without the problems associated with extracting surface forces. All of the above attributes increasingly make air power the instrument of choice for politicians as it best fits the political requirements for military intervention.

While air power has played an increasing role in the post-Cold War world, there are a number of limitations that need to be considered: the accuracy of PGMs is dependent upon good intelligence, air power has difficulty targeting non-state actors, and it encounters significant difficulties when employed against strategic targets that are not static. Despite the highly accurate bombing demonstrated by PGMs, the world media remembers the bombs that go astray. The destruction of the Al Firdos command bunker in the Gulf War that resulted in the death of 314 sheltering civilian Iraqis,[23] illustrated PGMs' dependence upon good intelligence. Similarly, it can be argued that the way in which the accuracy of these weapons is presented leads to false expectations. The Circular Error Probability (CEP) of PGMs is generally quoted in tens of feet, however, CEP only shows where the nearest 50 per cent of the weapons will fall. PGMs perform poorly when their guidance systems fail, a problem which can result in the weapon missing the target by miles. In 1998, a US Tomahawk cruise missile went so far astray as to land in Pakistan instead of Afghanistan. While PGMs have undoubtedly improved the capability of air power within military operations, there remain serious limitations that must be taken into account,[24] and it would be unwise to exaggerate capabilities.

Increasingly, limited intensity combat operations are directed against non-state actors, such as communal militias, violent political movements, and other organised political actors that are not nation states. Recent examples include Somalia in 1992 and 1993, Bosnia in 1995, and the destruction of targets connected to Osama bin Laden's terrorist organisation in 1998. It is clear that there are inherent difficulties in using air power against non-state actors: such adversaries may lack identifiable and targetable assets, inaccurate intelligence estimates are common and non-state adversaries may lack control over constituent elements.[25] The US missile attacks against Osama bin Laden were ineffectual as he lacked assets that were vulnerable to military force. Further, inaccurate intelligence led to US Cruise missiles

destroying what was believed to be a chemical warfare production facility in the Sudan, linked to bin Laden. The facility was in fact a pharmaceutical factory, a mistake that caused severe embarrassment to the US. Although air power has succeeded in some instances, it needs to overcome the problems of a lack of targets and dislocated authority which provide circumstances in which air power struggles to be effective. It is not clear, however, that these difficulties could be better overcome by the use of an alternative military method, such as ground forces.

Air power has been utilised for strategic effect with varying degrees of success in the post-Cold War era. Strategic bombing is directed towards the opponent's centres of gravity, such as infrastructure, key production facilities and fielded military forces, where 'the effect sought by air power could be destructive, non-destructive or a combination of both, against target sets which undermine the opponent's ability, will and means to continue his aggression'. [26] Analysis of two case studies, Operation *Desert Storm* and Operation *Allied Force*, highlights the effectiveness of air power in destroying static strategic targets.

During Operation *Desert Storm* air power was successful in destroying many strategic target sets including command and control organs, power generation facilities, refined lubricant production plants, transportation infrastructure and dug-in troops. The Baghdad electrical power grid was disabled after aircraft destroyed 27 generation plants and transmission facilities throughout the country.[27] Similarly, 28 Iraqi oil facilities were devastated, effectively shutting down refined petroleum production, and after ten days of attacks Iraqi refined oil production was also shut down,[28] while the destruction of 44 command and control facilities left the Iraqi leadership separated from their forces and unable to communicate effectively.[29] The vast Iraqi force assembled in Kuwait, numbering 500,000, depended upon constant supplies of food, water, fuel and ammunition from Iraq. Coalition aircraft destroyed 44 key rail and road bridges in Iraq,[30] effectively halting resupply, while the troops themselves, their equipment and supply dumps in Kuwait, were continually targeted. Supply levels were cut by 90 per cent, and 48 per cent of tanks, 30 per cent of armoured troop carriers, and 60 per cent of artillery [31] were destroyed, seriously degrading Iraq's ability to fight Coalition ground forces. Consequently, it has been argued that strategic air power was the decisive factor in the Coalition's victory in the Gulf War:

> *'Gulf Lesson One is the value of air power'.* [32]

It can be argued, however, that the Gulf War was ideally suited to air attack, and surrounded by unique conditions. The Iraqi army fought a conventional war, utilising large formations that were immobile, dug in, and occupying sparsely populated desert terrain far away from civilians. These conditions meant that the Iraqi forces were easier to target and air vehicles could use large amounts of unguided munitions without fear of causing collateral damage. Coalition air power was thus able to inflict an unprecedented level of destruction on fixed targets and Iraqi fielded forces in a relatively short space of time.

Air power was less successful during Operation *Desert Storm* in combating mobile targets, especially Scud missile launchers. Iraqi Scud missiles posed a considerable threat to Coalition cohesion during the Gulf War by threatening to provoke Israel's entry into the conflict. The destruction of Scud missile launchers was therefore a top priority for campaign planners. Nevertheless, despite 2,493 sorties dedicated to the 'Scud hunt', the Iraqi launchers were never fully suppressed – 88 were fired against Israel, Saudi Arabia and Bahrain.[33] While aircraft managed to destroy most of the fixed Scud launch sites,[34] the majority of the mobile launchers that Coalition aircrews believed that they had destroyed were later found to be decoys.[35]

Although directed against very different enemy forces, NATO air power was as effective against static targets during Operation *Allied Force* as in the Gulf, attacking 440 static targets, with over 75 per cent suffering moderate to severe damage.[36] Moreover, NATO destroyed or significantly damaged a wide array of targets including: 14 command posts, 34 road bridges, 11 railway bridges, 29 per cent of all Serbian ammunition storage capacity, 57 per cent of petroleum reserve capacity and all Serbian controlled oil refineries.[37] Consequently, Operation *Allied Force* served to reinforce the efficacy of air power against fixed targets.

Kosovo did, however, provide NATO air power with a more challenging scenario in which to demonstrate its effectiveness against ground forces. NATO dedicated over 30 per cent of its sorties to the destruction of Serb forces, which was regarded as NATO's 'No 1 priority'.[38] Yet, these forces proved to be very adept at 'going to ground', and concealing their heavy equipment in woods and urban areas, thereby posing a high risk of collateral damage for NATO. Decoys were also used extensively throughout Kosovo, while Serbian troop formations were small in number, widely dispersed and constantly on the move. Consequently, NATO aircrews were hampered by insufficient intelligence regarding the location of Serb forces, which was necessary for the effective use of PGMs. Moreover, Serb forces were not heavily dependent on re-supply from their homeland as food and water could be obtained locally, and they had their own ammunition stores within Kosovo. Overall, therefore, NATO aircraft encountered great difficulty in destroying Serbian fielded forces.

In the aftermath of the conflict NATO claimed to have destroyed 93 tanks, 153 armoured personnel carriers, 339 military vehicles and 389 mortars and artillery pieces.[39] The British Ministry of Defence claimed that NATO air power effectively reduced the Serb's capacity to carry out ethnic cleansing by forcing their heavy equipment into hiding. Sir John Goulden remarked that 'the bottom line is that we bottled up the equipment that was in Kosovo'.[40] It can be argued, however, that Serb forces only required heavy equipment in order to fight a NATO ground force, as lightly armed Serb infantry were more than a match for Kosovo Liberation Army troops lacking training and combat experience. Furthermore, air power was unable to stop Serb troops and militia burning the homes of Kosovar Albanians and forcing 850,000 of them to flee abroad.[41] Judah has argued that the efficacy of air power against tanks and artillery is academic when, 'the most potent weapon in ethnic cleansing is the cigarette-lighter needed to set houses on fire'.[42] Equally seriously, NATO aircraft were

constrained by topography that provided the enemy with the ability to conceal their troops, and by adverse weather – both optical and laser guided PGMs were unable to track targets obscured by large amounts of cloud. The House of Commons Select Committee on Defence's report stated that: '[NATO air power] did not stop Serbian forces from forcing civilians from their homes and manipulating the refugee flow'.[43] Consequently, air power can be seen as ineffective against widely dispersed small groups of lightly armed troops that are concealed by wooded areas and mountains, or intermingled with civilians. Thus, the evidence of air power in Kosovo confirms the picture presented by the Gulf War – that air power is highly effective against static strategic targets, but is far less impressive when faced with mobile targets such as Scud missile launchers or light infantry.

Perhaps the most striking feature of the post-Cold War security environment, however, is not the more conventional conflict scenarios discussed above, but the Peace Support Operations (PSOs), defined as, 'multi-functional operations involving military forces and diplomatic and humanitarian agencies … that … are designed to achieve humanitarian goals or long term political settlement'.[44] This concept of operations includes peacekeeping, peace enforcement, conflict prevention, peace making, peace building and humanitarian missions. While the UN initiated just 13 PSOs between 1948 and 1988, during the last decade this has risen significantly, with the UN activating 36 such operations, including those undertaken in Somalia, Haiti and Bosnia.[45]

Air power also has a role to play within PSOs. Utilising its strengths air power has the ability to carry out certain tasks more effectively than land and naval power within these types of operation, such as ISR, the rapid transportation of men and supplies, and enforcing no fly zones. Nevertheless, this does not mean that air power is able to carry out PSOs in isolation, as ground personnel are required for many roles, such as providing human intelligence (HUMINT) and building interpersonal relationships with the host nation.

Colonel Owen of the United States Air Force has proposed four tactical roles within PSOs that air power assets are able to undertake: observation, interposition, patrolling, and civic actions.[46] In the first area, observation, air power offers significant capabilities, including the ability to cover a wide area continually, provide a high standard of definition on specific targets, and a day and night all- weather capability. Air vehicles can be used to observe the implementation or violation of a truce process, including cease fires, border violations and the positioning of troops, as well as the location and size of threats to the Peace Support force. Air power, through the use of ISR assets such as the U2/TR1A high altitude manned reconnaissance aircraft, the Phoenix UAV, and Helios satellite constellation, is able to cover a wide area, with a good view from a variety of altitudes. ISR assets provide not only a high standard of definition coupled with a day and night capability, but also radar equipped platforms such as the E-8 Joint Surveillance and Target Attack Radar System which are largely unaffected by the weather. Finally, modern UAVs allow specific targets or areas of territory to be observed for long periods of time. Long endurance UAVs, such as the United States'

Predator platform, which was successfully deployed over Bosnia, combine a range of 500-700 kilometres with an endurance time of 48 hours.[47] ISR assets have been used to good effect, exposing the existence of mass graves in Bosnia and highlighting the movement of large numbers of refugees towards the Macedonian border in Kosovo.

While air power undoubtedly increases the ISR capability of a military force, there remain limitations to what it is capable of observing. It cannot reveal the content of buildings or vehicles, detect small arms from a distance, or discriminate between military and civilian trucks in a convoy. In Kosovo, NATO mistook a refugee convoy for military vehicles and killed fifty civilians.[48] Ground troops are required to search buildings and vehicles and provide detailed local HUMINT, enhanced by familiarity and experience with the local environment. In contrast with air assets, troops are able to promote good relations with the local population, thereby helping to deter violations of peace agreements. Further, high technology ISR assets are extremely expensive, especially as a multiplicity of sensors are required to provide total coverage and clarity, and are therefore not available to all armed forces.

The second role that air power undertakes within PSOs is interposition, where military forces are used to create and maintain buffer zones between belligerents, and to prevent border violations and military confrontation. Air assets possess the ability to move troops and equipment rapidly over large distances, unconstrained by the barriers of physical topography, such as mountains and lakes. In contrast land forces have great difficulty transporting troops and equipment quickly to isolated locations without good quality roads. Further, the speed and reach of aircraft means that they can respond quickly to sudden changes in the situation on the ground, facilitating the rapid interposition of forces to complete the tasks highlighted above.

Thirdly, air vehicles can be used to patrol the area of operations to increase the visibility, credibility and effectiveness of the Peace Support force. Patrolling aircraft provide a means by which the Peace Support force can establish control over the belligerents through the enforcement of no-fly zones and air embargoes. Moreover, the speed and responsiveness of air vehicles means that they can provide valuable support and protection to land based patrols dispersed over a wide area. Such air patrols are relatively invulnerable, while land patrols are vulnerable to attack by snipers and superior force levels.

Fourthly, air power is capable of carrying out civic actions that can promote stability and confidence between the Peace Support force and the host nation. Civic actions can include a multitude of tasks such as providing assistance to law enforcement agencies, protecting economic assets, the provision of specialist advice, the distribution of food and medicine, and the evacuation of people from disaster areas. For example, British helicopters and transport aircraft were used both to rescue civilians from floods in Mozambique, and to deliver vital supplies to Sarajevo during the Bosnian conflict. Air assets possess the ability to reach isolated areas quickly, particularly important in siege or disaster relief operations. In comparison with surface transportation, however, aircraft payloads are usually smaller. Moreover, ground

forces are able to develop important interpersonal relationships, building trust with the local population and leaders through face-to-face contact.

Air power is a vital component of most PSOs, providing a highly visible presence through patrols or the transportation of troops, equipment and supplies in a short period of time. Once a government decides to initiate a PSO it is important that action is taken quickly in order to demonstrate commitment and resolve to the electorate, coalition partners and those parties that the politicians are attempting to support or to deter. If troops and supplies are needed urgently, then air vehicles are the only means of achieving this aim. The utility of air power has been demonstrated by their use in every major PSO since the end of the Cold War, including Bosnia, Kosovo, Somalia and Sierra Leone.

Since the end of the Cold War the international security environment has changed considerably as a result of the decline in east-west antagonism. Without ideological rhetoric, politicians have found it increasingly difficult to justify military operations abroad. Governments have found themselves constrained by the reluctance of the electorate to support action unless national interests are at stake, and have therefore emphasised the humanitarian nature of operations in order to gain public approval. Additionally, media images play an important role in retaining public support throughout a military operation. Images such as the public execution of US troops in Somalia or the bombing of a civilian convoy in Kosovo can lead to public disapproval and the ending of military action. Politicians, therefore, when confronted by low-intensity regional conflicts are required to deliver short but decisive operations that are ideally bloodless for both sides.

Within this political environment the positive attributes of air power have led to it becoming the military instrument of choice for politicians. Air power offers fewer friendly and enemy casualties, as well as less collateral damage than ground operations. The increased accuracy offered by PGMs has led to the development of 'effects-based' targeting, improving the efficacy of air power in combat operations. The utilisation of air power can, therefore, lead to fewer images of death and destruction in the media, and thereby help to engender continued public support for military operations. Furthermore, PGMs offer the ability to destroy a large number of targets simultaneously, resulting in shorter operations. In short, without the use of air power politicians would have been more reluctant to embark on limited-intensity military operations. Moreover, as future development further enhances accuracy and range for PGMs, the role of air power within military operations will continue to increase. Operations *Desert Storm* and *Allied Force* highlighted the efficacy of air power against all types of static targets. It is the only type of military force that is capable of penetrating deep into the enemy homeland without first defeating their fielded forces, and it has been and will continue to be successful in combating fielded forces that are reliant on heavy equipment or on extensive re-supply.

Air power is, however, limited in some important respects; for example, the accuracy of PGMs is reliant upon good intelligence and the performance of sophisticated guidance

systems. Furthermore, non-state actors that lack identifiable targets have demonstrated a degree of immunity to air attack, and the efficacy of air power against mobile targets is uncertain, especially when the enemy is adept at utilising topography and local communities to conceal forces and equipment. Importantly, the ability to deny the enemy the use of his heavy equipment is academic in situations where only light infantry is required to achieve the objective. Despite these limitations, however, as long as the international security environment is characterised by regional conflict, low-intensity fighting or humanitarian crises, air power will be central to any military option available to political leaders.

Notes

[1] *Allied Force* was the NATO designate for the air campaign conducted during the Kosovo conflict in 1999.
[2] Operation *Desert Storm* was the US designate for the military operations carried out by Coalition forces during the 1991 Persian Gulf War.
[3] Richard Hallion, *Storm Over Iraq: Air power and the Gulf War*, Smithsonian, 1991, p. 2.
[4] *AP 3000 British Air Power Doctrine*, HMSO, 1999, p. 1.2.1.
[5] *AP 3000 British Air Power Doctrine*, p. 1.2.1.
[6] *AP 3000 British Air Power Doctrine*, pp. 1.2.3-1.2.8.
[7] *AP 3000 British Air Power Doctrine*, p. 1.2.3.
[8] *AP 3000 British Air Power Doctrine*, pp. 1.2.4-1.2.5.
[9] *AP 3000 British Air Power Doctrine*, pp. 1.2.4-1.2.5.
[10] Lawrence Freedman and Efraim Karsh, *The Gulf Conflict*, Faber and Faber, 1994, pp. xliv-xlv.
[11] Operation *Restore Hope* took place from December 1992 – May 1993, and was aimed at securing the safe delivery and distribution of humanitarian aid within Somalia.
[12] House of Commons Select Committee on Defence, 'Fourteenth Report: The Kosovo Campaign', 23 November, 2000.
[13] House of Commons Select Committee on Defence, 'Fourteenth Report'.
[14] House of Commons Select Committee on Defence, 'Fourteenth Report'.
[15] Group Captain Andrew Lambert, *The Psychology of Air Power*, RUSI Whitehall Paper Series, 1994, p. 4.
[16] *Deliberate Force* was the NATO designate for the air campaign in the Balkans, beginning in 1995.
[17] John Tirpak, '*Deliberate Force*', Air Force Magazine, October, 1997, p. 39.
[18] Collateral damage is defined as damage to property or personnel adjacent to, but not constituting part of, an authorised target.
[19] The United States Air Force B-2 Spirit bomber is capable of carrying 16 Joint Direct Attack Munitions (JDAM), enabling a single aircraft to initiate a parallel attack against 16 separate targets.
[20] Merrill McPeak, 'Precision Strike: The Impact on the Battle Space', Military Technology (May 1999), pp. 20-24.
[21] House of Commons Select Committee on Defence, 'Fourteenth Report'.
[22] It costs approximately $14,000 to transform a 'dumb bomb' into a global positioning system

guided munition, using a JDAM tail kit. Source: Wing Commander Ken Smith, Air Warfare Centre, RAF Cranwell.

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[24] Wing Commander Greg Bagwell, 'Precision Weapons: Considerations for their employment', *Air Power Review*, Vol. 2, No. 1 (Spring 1999), pp. 1-14.

[25] Daniel Byman, *et al.*, *Air Power As a Coercive Instrument*, RAND, 1999, pp. 107-26.

[26] *AP 3000 British Air Power Doctrine*, p. 2.6.1.

[27] Hallion, *Storm Over Iraq*, p. 191.

[28] Hallion, *Storm Over Iraq*, pp. 192-193.

[29] Hallion, *Storm Over Iraq*, p. 190.

[30] Hallion, *Storm Over Iraq*, p. 190.

[31] Stephen Biddle, 'Victory Misunderstood: What the Gulf War Tells Us about the Future of Conflict', International Security, Vol. 21, No. 2 (Fall 1996), pp. 139-79.

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[34] Hallion, *Storm Over Iraq*, p. 179.

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[37] House of Commons Select Committee on Defence, 'Fourteenth Report'.

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[39] General Wesley Clark and Brigadier General John Corley, 'Press Conference on the Kosovo Strike Assessment', 16 September, 1999.

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[42] Judah, *Kosovo*, p. 309.

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[45] Colonel Robert Owen, 'Aerospace and Land Power in Peace Operations: toward a new basis for synergy', *Air Power Review*, Vol. 2, No. 4 (Winter 1999), p. 27.

[46] Owen, 'Aerospace and Land Power in Peace Operations', pp. 26-47.

[47] Peter van Blyenburgh, 'UAVs: Where Do We Stand?', *Military Technology*, March 1999, p. 30.

[48] Judah, *Kosovo*, p. 260.