

# Long-Range Offensive Air Power:

## A Strategic War-Winner, or Tactical Supporter of Ground Forces?

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*'Air power can win wars, of course it can!'*<sup>1</sup>  
But can it?

The debate over the most effective use of offensive air power has raged since the First World War. The 2003 Iraq War highlighted the need to improve the support of the land forces by air power,<sup>2</sup> reinvigorating the debate over the relative merits of strategic and tactical air power. It is therefore timely to revisit this age-old dispute.

The term 'strategic bombing' evokes historical images of long-range bombers targeting cities in an attempt to break the population's will to fight. However, RAF doctrine has evolved. 'Air operations for strategic effect' aim to undermine the opponent's ability, will and means to continue

his aggression.<sup>3</sup> This can be achieved by bombing or non-lethal means and is normally conducted independently from land or maritime forces.

In contrast, tactical offensive air power aims to deprive the enemy of the military power he needs to occupy territory or exploit sea space.<sup>4</sup> However, there is an increasing blurring of platform roles and the levels of war; B52 bombers were used for Close Air Support (CAS) during the 2001 Afghan Conflict, where they achieved strategic effect in terms of the overall campaign.<sup>5</sup>

Coercion is a pervasive theme when analysing offensive air power because the objective of most air campaigns is to make the victim comply (by withdrawing, surrendering or achieving a behavioural change) rather than annihilate him.



The bombing of Baghdad in the recent war with Iraq

## *Air power has non-coercive applications such as the use of 'brute' force to deny the opponent the capability to employ weapons of mass destruction*

However, air power has non-coercive applications such as the use of 'brute' force to deny the opponent the capability to employ weapons of mass destruction. Therefore, the discussion centres on the relative merits of strategic and tactical effect, rather than concentrating on coercion alone.

The logic of this article develops in three stages. Firstly, the scene will be set by a discussion on

legal constraints, Centres of Gravity (CoGs), targeting and coercive strategies. Secondly, 6 case studies will be analysed, with an emphasis on breadth rather than depth. These case studies cover the major applications of UK and US air power from the 1986 Libyan air strikes to the 2003 Iraq War. Finally, the threads are drawn together in a summary of the most significant lessons concerning the strategic and tactical employment of air power.

### Legality

The way that the UK wages war is constrained by legal and doctrinal factors. 'Protocol 1 Additional' to the Geneva Conventions is now ratified under UK domestic law. Amongst other things, Protocol 1 addresses 'civil-military distinction', stating that 'attacks shall be limited strictly to military objectives'<sup>6</sup> and 'parties to the conflict . . . shall direct operations only against military objectives.'<sup>7</sup> Attacks against the population or individual civilians are defined as 'grave breaches' of the Geneva Conventions which 'shall be regarded as war crimes'.<sup>8</sup> The protection that Protocol 1 offers civilians is morally laudable, but can restrict the way in which coercive strategies are applied, since attacks 'to spread terror among the civilian population are prohibited'.<sup>9</sup> Pending a change of the Geneva Conventions' definition of a 'civilian', the Protocol brings into question the legality of applying coercive force on civilians who support an opponent leader's political or economic power base; Protocol 1 currently states that 'in case of doubt whether a person is a civilian, that person shall be considered to be a civilian'.<sup>10</sup>

### Centres of gravity

To ensure that force is used as sparingly as possible, UK doctrine only permits the use of force against those targets that effect the enemy's CoGs. A CoG is defined as 'those characteristics, capabilities or localities from which a nation, an alliance, a military force or other grouping derives its freedom of action, physical strength or will to fight'.<sup>11</sup> However, as Sun Tzu advises us to avoid attacking an enemy's strengths to avoid costly attritional battles,<sup>12</sup> a CoG is perhaps better conceptualized as 'that on which the enemy relies for success', rather than a strength or weakness. According to Clausewitz, we should trace 'the ultimate substance of enemy strength . . . back to the fewest possible sources, and ideally to one'.<sup>13</sup> UK doctrine agrees that there should be only one CoG at the strategic and operational levels, 'although in practice this may prove simplistic'<sup>14</sup> and 'it is quite possible for the CoG to change'.<sup>15</sup> In practice, the UK accepts that there will only be one CoG at each level of war,<sup>16</sup> although US doctrine accepts that 'frequently, multiple centres of gravity will exist at any given level of war'.<sup>17</sup> It is therefore vital that the correct CoG is selected, as attacks that do not contribute to this CoG are in contravention of the customary

law of military necessity, which states that 'the employment of any kind or degree of force not required for the partial or complete submission of the enemy . . . is prohibited'.<sup>18</sup> CoG selection and legal issues became major factors during the Kosovo Campaign.

### Targeting

The essence of projecting offensive air power is targeting. There are several different targeting strategies that can be employed. Attritional, 'resource-based' targeting is a relatively simple matter of listing the enemy's assets and infrastructure, then matching platforms and weapons to each of these targets. However, with better intelligence, it is possible to carry out a 'nodal analysis' of the enemy's infrastructure to identify critical targets. For example, it may be possible to neutralize an electrical power grid by targeting a few critical sub-stations, rather than destroying every power station. With this knowledge, specific effects can be achieved with minimum effort, cost and casualties. By targeting specific sub-systems, precision-guided munitions (PGMs) may allow a specific amount of functional degradation to be imposed on a target. Targeting a critical, irreplaceable sub-system such as a power station's generators may neutralize the target for years, whereas attacking the same target's transformer yard with carbon-graphite filament weapons will stop power production for only as long as it takes to remove the threads. Although this targeting strategy seems preferable to attrition, political constraints can constrain the full application of air power's potential, as will be demonstrated in the Kosovo case study.

Prior to the 1991 Gulf War, Colonel John Warden developed the 'five-Ring' targeting strategy. Warden, an advocate of strategic bombing, opined that 'the purpose of war is not to defeat the enemy's armed forces . . . we easily get lost in a Clausewitzian world in which defeat of the enemy military forces becomes an end to itself rather than merely one of a number of possible means to a higher end'.<sup>19</sup> He conceptualized any target system at the strategic level as five concentric rings, as shown in **Figure 1**. In the middle is the 'organizational centre' (in the case of a country, the leadership and strategic communications) without which the system cannot operate. This is 'the figurative and

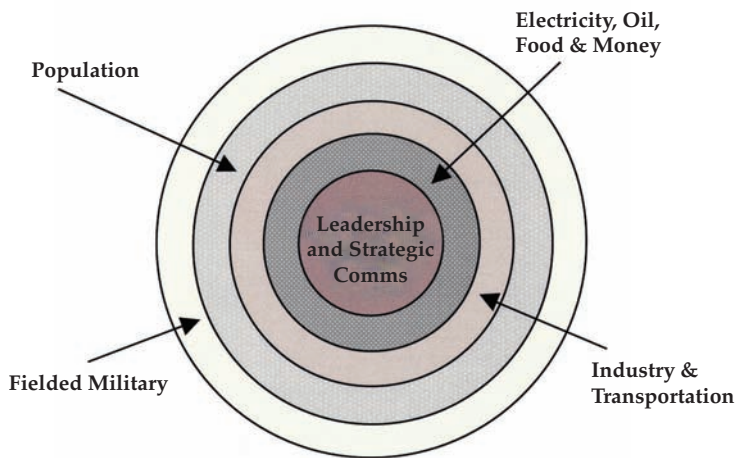


Figure 1. Warden's '5-Ring' model of a nation state

sometimes the literal target of our every action'.<sup>20</sup> The next ring contains the 'system essentials' on which modern states depend, such as electricity, oil, food and money. As Warden says, 'Unless the stakes in the war are very high, most states will make desired concessions when their power-generation system is put under sufficient pressure or actually destroyed'.<sup>21</sup> The third ring is 'infrastructure', such as industry and transportation. Although there is often a delay between targeting strategic infrastructure and its tactical consequences, the effects can be enduring. Therefore, the efficacy of targeting industry in short conflicts is questionable unless used as a coercive tool in itself or if the desired effect is, say, the *long-term* degradation of a military capability. However, targeting industry will increase the cost of post-conflict reconstruction. As already discussed, targeting the fourth 'population' ring directly may be constrained by legal and moral factors, although indirect coercion may be possible. However, tyrannical leaders may have sufficient control over their populace to be invulnerable to their influence. Nonetheless, some adversaries, such as al-Qaeda, may deliberately target a Western population; public support may be the West's strategic CoG, and it will need to be

protected. Warden, however, dismisses targeting morale as being 'beyond the realm of the predictable... because humans are so different from each other' adding that 'our war efforts, therefore, should be directed primarily at the physical side'.<sup>22</sup> The outer ring is the 'fielded military' that, according to Warden, serve only to protect the inner rings and can often be vertically outflanked by air power. All these rings are inter-related. Therefore, although direct attack on a specific ring may be constrained by rules of engagement or its invulnerability, targeting another may induce second or third-order effects on the desired system.

Both stealth and PGMs act as considerable force multipliers. In World War II, the vulnerability of the 'strategic' bomber and its poor weapon accuracy meant that it took 'thousand-bomber' raids to penetrate German air defences and attack a single target, resulting in 'serial' warfare. However, a single B2 can now release 80 PGMs against 80 separate targets in a single pass.<sup>23</sup> Indeed, the RAF's proportional use of PGMs has increased from 18% during the 1991 Gulf War to 25% in Kosovo and 85% in the 2003 Gulf War.<sup>24</sup> This potentially allows a 'parallel attack' against all of Warden's rings simultaneously, overwhelming the opponent and leading to 'strategic paralysis' where the enemy is physically constrained from offering resistance. Although Warden contests that the 5-Ring model 'seems to describe most systems',<sup>25</sup> networked organizations, such as al-Qaeda, are notable exceptions.

Warden's model is heavily biased towards air power and kinetic targeting. As a concept, it is more robust if an effects-based philosophy is applied, whereby the desired effect in each subsystem is achieved by applying the most appropriate tool, be it diplomacy, economics, or information operations. For example, pressure could be applied by imposing sanctions, attacking financial computer networks, or supplying humanitarian aid. This approach, which seeks to influence the adversary's perceptions while minimizing casualties and collateral damage, is termed Effects-based Operations (EBO). To be effective, it requires cross-government and cross-coalition synchronization, possibly even extending

to non-governmental organizations. 'Joined-up government' is therefore essential, as will be illustrated in the 2003 Iraq War case study.

It is apparent that an in-depth knowledge of the enemy system is essential if the desired effects are to be achieved. Additionally, the amount of functional disruption achieved must be measured to determine whether the desired effect has been achieved and whether a re-attack is required. Therefore, the *sine qua non* of targeting is accurate and timely intelligence. Without this, effects-based targeting is severely constrained. Furthermore, remote sensors that provide high-resolution imagery, whilst of value, are not enough. All-source intelligence must be gathered and managed, a process called Operational Net Assessment. Rather like playing a game of chess, being able to see all your opponent's pieces tells you little about his intentions and does not confer 'decision superiority'. This became a major factor in the 2003 Iraq War.

### Coercion

Coercion is one of the eight military effects defined in the 2003 Defence White Paper. While there are occasions when 'brute force' is required (such as the 1981 Israeli air strike on the Osirak nuclear reactor which halted Iraq's nuclear weapons program<sup>26</sup>), strategically, annihilation is rarely the ultimate aim; persuading your opponent to comply, either by offering inducements or applying force, is normally less costly. Coercion, as a form of persuasion, involves applying psychological pressure to an opponent to undermine his will to fight by creating the perception that the cost of conceding outweighs the benefits of continued resistance. However, a victim can tolerate considerable pain if he believes victory is within his grasp.<sup>27</sup> The psychological nature of coercion makes predicting the probability of success difficult, especially if the coercer and victim are from different cultures. A thorough knowledge of the enemy's psyche is essential; as Schelling notes, 'one needs to know what an adversary treasures and what scares him'.<sup>28</sup> The victim's perceptions may be at variance to the coercer's intentions, so communication is a vital ingredient of effective coercion. The victim must also believe that the coercer has both the capability and the will to carry

out a threat. Both deterrence and compellence are forms of coercion; deterrence seeks to maintain the *status quo*, while compellence attempts to change the victim's behaviour.

Classically, the leadership, population or armed forces are the targets of coercion. Historically, targeting the leadership or population was classed as 'strategic' attack, whereas targeting the military was deemed to be 'tactical'. Nonetheless, coercing any of the groups can have strategic effect. The relationship between a coercer and victim is normally interactive, with the victim seeking to coerce the coercer into abandoning his strategy.<sup>29</sup> Effective coercion must therefore neutralize the victim's conventional and asymmetric responses. The taxonomy of coercive diplomacy is somewhat confused. Robert Pape has published widely on coercion and contends that there are 4 basic coercive strategies.

### Punishment strategies

The first strategy, 'punishment', involves inflicting pain without necessarily reducing the victim's war fighting capability; in other words, targeting his *will*, rather than his *ability* to resist. Punishment strategies rely on creating the fear of future pain, as in the 1986 US air strike on Libya. Clearly, it is possible to punish any of the three target audiences, although Pape erroneously equates punishment only with direct harm to civilians, concluding as a result that '*punishment does not work. When important interests are at stake, modern nation-states have very high pain thresholds*'.<sup>30</sup>

### Denial strategies

The second strategy, 'denial', seeks to defeat the enemy's military strategy by weakening his fielded forces until he *perceives* that he cannot successfully defend his territory. Although not necessarily defeated, the victim then concedes to the coercer's demands rather than continue suffering for no gain. The enemy can be weakened by targeting his fielded forces directly, by attacking his armament industry or by interdicting his logistical supplies. Pape states that '*denial can work, but strategic bombing is not the best way to achieve it . . . Theatre air power is a much stronger coercive tool*'.<sup>31</sup> Pape's ideas are essentially Clausewitzian: '*if you are to force the enemy, by making*

war on him, to do your bidding, you must either make him literally defenceless or at least put him in a position that makes this danger probable'.<sup>32</sup> However, Pape focuses on wars of territorial gain; his comments on 'strategic' bombing appear less relevant in non-territorial coercive disputes, as will be shown in the Kosovo case study. Denial and destruction have much in common; as Mueller says, 'the best way to convince someone that defeat is inevitable is usually to make it inevitable'.<sup>33</sup> Therefore, if denial fails, the campaign can be continued until the enemy's fielded forces are annihilated. **Figure 2** illustrates the varying force associated with these strategies.

### Risk strategies

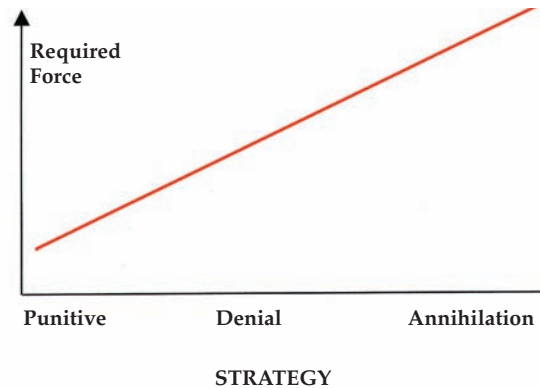
Pape terms the third coercive strategy 'risk', although others have called it 'try and see'.<sup>34</sup> Risk strategies are essentially incremental, escalating punishment strategies and can develop from initial punitive strikes, through denial, to annihilation. Risk strategies can be tempting in conflicts where the coercers are not fully committed to the cause and so do not want to apply excessive force. However, incremental coercion can reveal the coercer's constraints, weaknesses or lack of resolve, which may actually encourage the victim to resist. Pape states that 'risk does not work'<sup>35</sup> because it is merely a watered down punishment strategy, but again he only considers targeting the population.

### Decapitation strategies

The final strategy, 'decapitation', involves PGM strikes against leadership and telecommunication targets; 'regardless of the strength of a state's fielded forces . . . if the leadership is knocked out, the whole house of cards comes down'.<sup>36</sup> Again, Pape states 'decapitation does not work'.<sup>37</sup> He accuses Warden's 5-ring model, as applied to the 1991 Iraq War, as being a decapitation strategy, which Warden rebukes: 'our strategy was not a decapitation strategy. Our plan was to impose strategic paralysis on Iraq'.<sup>38</sup> Warden's argument rings true; isolating the enemy leadership in 'limbo' makes them difficult to coerce, but may paralyse the country.

### Concatenation — the 'Bigger Picture'

Many authors have applied a 'reductionist' approach to coercion, breaking down this complex subject into constituent parts, analyzing them



**Figure 2.** Figurative graph of the varying amount of force required for different coercive strategies

in isolation and then ranking them in binary, 'all-or-nothing' terms (for example, successful/ unsuccessful). In reality, the victim has to assess the overall balance of military power, internal security, diplomatic support and economic prosperity, amongst other factors. Air power is additive and synergistic to other pressures, such as diplomacy, economics sanctions, media and information operations, and humanitarian aid. This 'concatenation effect' is most effective if the various pressures peak simultaneously, as shown in **Figure 3**.<sup>39</sup> This holistic approach will be used later to analyse six case studies.

### Psychological effects

Coercion, whether targeted at a population, the leadership, or the armed forces, is a form of persuasion and therefore relies on psychological effects against individuals. Lambert has conducted considerable research in this field and notes that 'the responses of soldiers and civilians in different cultures to bombardment have . . . a remarkable similarity... Symptoms appear to have more to do with response to overwhelming stress than with cultural . . . factors'.<sup>40</sup> Combat Stress Reaction (CSR) is a state where an individual ceases to function or begins to act in a manner that endangers himself and his colleagues. Symptoms include irritability and sleep disturbance, confusion, disorientation, depression, anxiety and psychosis.<sup>41</sup> Clearly,

this is a highly desirable effect to impose on an opponent. Although it is not necessary to impose CSR on a whole population or the decision-makers to have a coercive effect, the stressors that cause CSR are nevertheless likely to be coercive in lower doses. But what are these stressors, and can air power impose them? Fatigue, personal discomfort and poor hygiene (conditions often imposed on soldiers, but less often on regime leaderships) have been shown to increase individuals' susceptibility to CSR.<sup>42</sup> Loud noises, the perception of being expendable and a feeling of isolation are also major stressors;<sup>43</sup> it has been demonstrated that

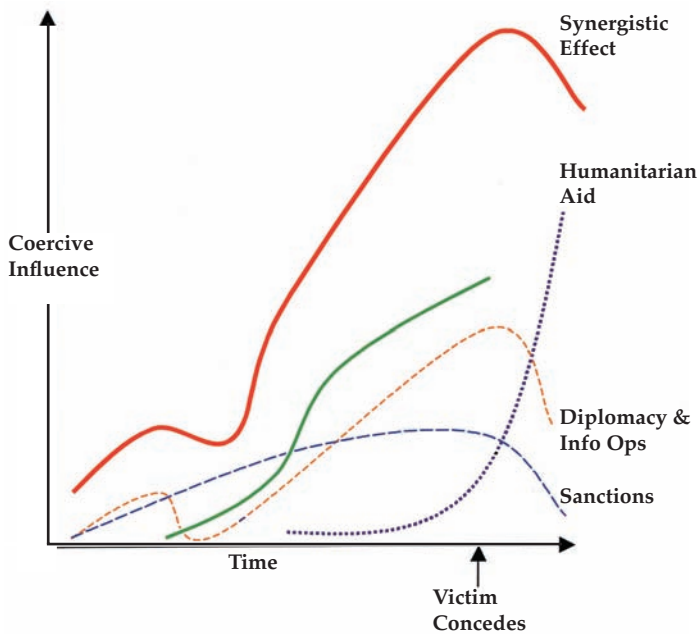


Figure 3. Figurative graphical representation of the proposed 'Concatenation Effect'

tightly knit groups of men can endure greater pain and discomfort than individuals, while evidence from the Korean War indicates that morale is highest in groups of four.<sup>44</sup> Other CSR stressors include the perception of the enemy as omnipotent or omniscient, or the victim deeming himself helpless or impotent;<sup>45</sup> the ability to fight back is

a powerful stress reliever. Air superiority is the *sine qua non* of aerial coercion because it denies the enemy air defences the ability to inflict morale-raising losses on the coercer, while enabling bombardment from high level, which currently denies the fielded forces an opportunity to fight back. Night bombardment can be particularly demoralizing, as Speer highlighted during the 'Battle of the Bulge' in 1944: 'As if to illustrate our helplessness, our nocturnal talk was interrupted by a low-level attack from huge four-motored bomber formations. Howling and exploding bombs, clouds illuminated in red and yellow hues, droning motors, and no defence anywhere — I was stunned by this scene of military impotence . . .'<sup>46</sup> Expectations affect impact. Individuals create a mental model of how much stress and destruction they expect to suffer under attack. If more damage is imposed than expected, morale is likely to deteriorate; conversely, resolve soars when damage is deemed unexpectedly low.<sup>47</sup> On the other side of the Channel, German V-weapons had a disproportionate effect against Londoners because, following D-Day, they perceived that victory was near. As a result of the unexpected damage, 1,450,000 Londoners fled the city.<sup>48</sup> So, will the low-collateral characteristics of PGMs be perceived by the victim as lacking 'shock and awe', or will their 'precision and focus' be interpreted as being humanitarian? The case studies later in this paper will highlight this issue.

Having examined some 'raw' psychological aspects of coercion in isolation, it should be possible to apply them to some of the different coercive strategies and determine which are likely to be effective. However, although classical psychology can be fairly precise at predicting the effects of coercion on individuals, it is less accurate at predicting the effects on groups;<sup>49</sup> it is at this level that understanding cultural differences can be critical. The temporal aspects of coercion can be critical to success or failure. The sudden death of a large number of people has more psychological impact than the same number of casualties over a longer period of time.<sup>50</sup> Similarly, incremental coercive strategies can fail because the target group becomes habituated to the gently increasing levels of stress. It is tempting to gradually escalate the level of pain in order to

avoid applying too much force, especially in a loose coalition of countries with varying degrees of commitment, as with NATO during the Kosovo Conflict. However, few incremental campaigns have been successful. Operation Rolling Thunder during Vietnam illustrated that these strategies can lead the habituation of casualties and attrition.<sup>51</sup> A quantitative assessment by the US Strategic Bomber Survey of frequently bombed German civilians showed that 36% became habituated, while 52% never adapted.<sup>52</sup> Indeed, Seyle's General Adaptive Syndrome predicts that a victim's performance actually increases under stress until a critical level is reached (see **Figure 4**).<sup>53</sup> Furthermore, in long coercive campaigns, this critical threshold can be raised by the perceived betrayal of previous casualties or the linking of leaders' political survival to a successful outcome. Additionally, incremental campaigns can give the victim an opportunity to develop counters to the threats he faces. Thus, incremental campaigns can result in greater destruction than more sudden, intense strategies such as Vietnam's Operation Linebacker II. As Vietcong's Minister of Justice noted:

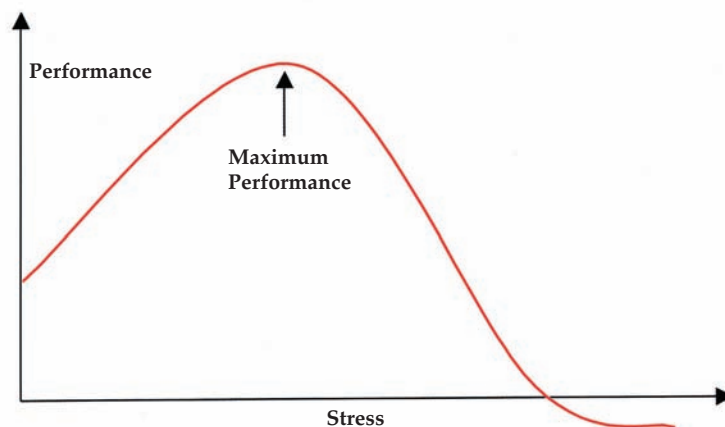
*'the first few times I experienced a B52 attack it seemed . . . that I had been caught in an apocalypse. The terror was complete'*.<sup>54</sup> Therefore, shock campaigns may actually be more humane. However, as we shall see from the Kosovo case study, aerial coercion is often used when the coercer lacks political commitment and therefore wants to use minimal force. Lambert suggests that successful coercive campaigns rely on giving the victim the following perceptions: he is incapable of withstanding the pressure; he is isolated from his backers; victory is impossible, yet defeat is probable; conceding to the coercer's demands is the least painful option; a face-saving way out exists to avoid utter humiliation. He highlights the need for recurrent engagement: *'Coercion is like the relationship of schoolmaster and schoolboy; it is not a one-shot event'*.<sup>55</sup>

### Libya

On 15 April 1986, the US launched Operation Eldorado Canyon against Libya in response to its increasing sponsorship of Palestinian terrorism against Western targets. Ten F111s attacked Tripoli,<sup>56</sup> damaging a terrorist command and control facility occupied by Colonel Qaddafi,

a commando training centre abandoned by Palestinian terrorists two days earlier and badly damaged 10 IL-76 aircraft at Tripoli Airport used to transport terrorists.<sup>57</sup> Fifteen A6 bombers attacked Benghazi, heavily damaging a terrorist training facility and destroyed a SAM site and up to 14 MiGs at Benina Airfield.<sup>58</sup> The Libyan Government announced 267 casualties, and unsuccessfully sued the UK and US Governments for \$2,036,577,000.<sup>59</sup>

Tension had been building between Libya and the West for some time over Libya's sponsorship of terrorism. International terrorist acts averaged about 500 per year between 1979 and 1983, but increased to 600 in 1984 and 800 in 1985.<sup>60</sup> Following Libyan-sponsored terrorist attacks on Israelis at Rome and Vienna Airports in December 1985,<sup>61</sup> the US implemented an escalatory coercive 'risk strategy', initially banning all US trade with



**Figure 4. Graphical representation of Seyle's General Adaptive Syndrome**

Libya.<sup>62</sup> In March 1986, the US deployed 3 aircraft carriers into international waters claimed by Libya, precipitating a Libyan-initiated exchange of fire. On 5 April a bomb exploded at 'La Belle Discotheque' in West Berlin, resulting in over 100

casualties. Incriminating Libyan radio messages provided the US with sufficient proof to launch Eldorado Canyon.<sup>63</sup> Announcing the raid, President Reagan emphasized that: *'we tried quiet diplomacy, public condemnations, economic sanctions, and demonstrations of military force. None succeeded.'*<sup>64</sup>

Eldorado Canyon inspired a brief spate of attacks against a handful of Westerners in the Middle East.<sup>65</sup> However, Middle Eastern terrorism in Europe dropped by almost 50% during 1986 and remained low through 1987.<sup>66</sup> Attacks against Americans dropped from 38 in 1985 to 12 in 1986, and to 7 in 1987. One academic proclaimed in 1987 that the US escalatory strategy *'appears to be a success for coercive diplomacy'*.<sup>67</sup> The pronouncement

was premature. In November 1987, the French intercepted a ship carrying 150 tons of Libyan arms bound for Irish terrorists; it was the *Ersund's* fourth delivery.<sup>68</sup> In December 1988 Pan Am Flight 103 exploded over Lockerbie<sup>69</sup> and in September 1989 a bomb destroyed the French UTA Flight 772 over Niger.<sup>70</sup> A French court found six Libyans guilty *in absentia*,<sup>71</sup> while in 2003, Libya accepted responsibility for the Lockerbie bombing in return for the removal of United Nations (UN) sanctions.<sup>72</sup> According to 2 Libyan spies, Qaddafi had ordered the Lockerbie bombing in revenge for the Eldorado Canyon raid.<sup>73</sup> Therefore, the raid appears to have achieved little long-term effect other than making Libya more covert about its support of terrorism.

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### Bosnia

NATO's 1995 Bosnian campaign was unique in that Western diplomats conducted a series of meetings with the adversary decision-makers during the conflict, giving a rare insight into the effects of coercive aerial bombardment. When Bosnia withdrew from Yugoslavia in 1992, civil war erupted as the Bosnian Serb Army (BSA) attempted to gain territory from the weaker Croatian and Muslim Bosnian Armies (BiH). A UN peacekeeping force (UNPROFOR) was deployed to keep the factions apart. There were occasional uses of CAS when UNPROFOR units were attacked; in April 1994 a Sea Harrier was shot down while engaging BSA tanks.<sup>74</sup> However, in November 1994, NATO carried out a limited air strike against the Serb-held airfield at Ubdina in retaliation for a BSA air raid on a Muslim enclave.<sup>75</sup> It was described by the US as a 'pinprick',<sup>76</sup> while UNPROFOR called it 'a textbook example of the precise use of force in a peacekeeping mission. Those who claimed that the UN had not used sufficient force were using war-fighting criteria... Our mandate was to keep the peace'.<sup>77</sup> Nonetheless, the situation declined; in May 1995 Bosnian Serbs took 370 peacekeepers hostage following NATO raids on the Bosnian Serb 'capital' of Pale, while in July Bosnian Serbs overran the UN-mandated 'safe area' of Srebrenica.<sup>78</sup> In response, the BiH began operations against the BSA in Western Bosnia in mid August.<sup>79</sup> When a mortar bomb killed 68 people in a marketplace in the 'safe area' of Sarajevo on 28 August 1995,<sup>80</sup> NATO launched Operation Deliberate Force. Its objective was to 'adversely alter the BSA's advantage in conducting successful military operations against the BiH'<sup>81</sup> to make the Bosnian Serbs 'sue for cessation of military operations, comply with UN mandates, and negotiate'.<sup>82</sup> Effectively, this was a coercive denial strategy to alter the military balance of power in Bosnia.

Deliberate Force started on 30 August 1995. NATO's air commander personally selected each aim point in an attempt to coerce the Bosnian Serbs into political dialogue. Day One commenced with aerial attacks on Bosnian Serb air defences.<sup>83</sup> Sixteen CAS sorties were flown, mostly against artillery and mortar positions, which were largely successful and caused little collateral damage.

However, poor weather and lack of Forward Air Controllers precluded further CAS missions for nine days. On the second day the target list expanded to include BSA ammunition facilities, depots, command posts and communications sites. Following assurances from the Serbian President, Milosevic, that General Mladic, the BSA Commander, was likely to give in, NATO halted strikes on 1 September.<sup>84</sup> During negotiations with the UN/NATO 'Contact Group' in Belgrade, Milosevic commented that it would be difficult for NATO to resume hostilities. However, on trying to contact Mladic in Pale, he found all communications between Serbia and Bosnia severed; the potency of the air campaign was becoming apparent to him.<sup>85</sup> Meanwhile in Vicenza, the Combined Air Operations Centre Director wanted to send Mladic photographs of the damage that NATO had wreaked, along with a mobile telephone so that he could contact NATO and the UN.<sup>86</sup> This illustrates the conflict between decapitation and coercion strategies, in that it is difficult to influence a decision-maker if he is isolated and lacks visibility of the ongoing destruction. Meanwhile in Bosnia, 14 hours of negotiations between UNPROFOR and Mladic ended in stalemate.<sup>87</sup> Deliberate Force recommenced on 5 September, shocking the Bosnian Serbs.<sup>88</sup> Nearly 300 aim points remained on NATO's target list. Air strikes targeted ammunition depots, storage facilities, command and control bunkers, and communications facilities.<sup>89</sup> 10 September saw the second use of CAS, when two hilltop bunkers and a large-calibre artillery piece were destroyed.<sup>90</sup> Having initially avoided targeting bridges for fear of civilian casualties, NATO attacked 12 bridges when the BSA began using them to reinforce Sarajevo.<sup>91</sup> Tomahawk cruise missiles were used for the first time against several communications facilities, demonstrating NATO's commitment by using its most advanced weaponry.<sup>92</sup> By 13 September NATO's target list was nearing exhaustion, but bad weather masked this from the BSA. However, the balance of power on the ground had swung in favour of the BiH, who were making considerable advances against the BSA. When the Contact Group met with Milosevic on 14 September, he looked 'very tired'<sup>93</sup> and implored NATO to stop the air strikes. Milosevic had Mladic driven to the negotiations, where he reluctantly gave in to NATO's demands.

### So why did NATO win?

So why did Mladic concede? It appears to have been a concatenation of events, with stressors all peaking simultaneously. The balance of power on the ground had swung in favour of the Croats and Muslims, with the BSA being unable to deploy troops effectively.<sup>94</sup> NATO had not intentionally integrated with the BiH, but admitted that their offensive had 'helped dramatically'. Richard Holbrooke, head of the Contact Group, concluded that air power was the 'most important single factor' that influenced the Serbs; 'never has airpower been so effective in terms of a political result.'<sup>95</sup> Indeed years later, at the Dayton negotiations, Holbrooke showed Milosevic a Tomahawk missile in a museum. 'So much damage from such a little thing' Milosevic retorted.<sup>96</sup> Nonetheless, diplomatic and economic inducements were crucial. NATO's Contact Group offered the removal of sanctions and recognition of a Serbian republic within Bosnia, a face-saving compromise that softened the blow of conceding.<sup>97</sup> Diplomacy would not have worked without military coercion, yet despite the success of NATO's denial strategy, it would ultimately have been unsustainable without diplomacy.

### Kosovo

The 1999 Kosovo Conflict started as a civil war between the Kosovo Liberation Army (KLA), representing the Kosovo Albanian majority, and the ruling Serbs. Despite several UN Resolutions and intense international diplomatic pressure, on 20 March 1999 the Serbian Regular Army (VJ) and Serbian Special Police (MUP) launched a major offensive, driving thousands of Albanian Kosovars out of their homes.<sup>98</sup> NATO responded with Operation Allied Force on 24 March. Based on experience from Bosnia, NATO expected that Milosevic would sue for peace after a few days of aerial bombardment.<sup>99</sup> He finally conceded 78 days later on 3 June. When asked why Milosevic conceded, NATO's Supreme Commander in Europe, General Clarke, replied: 'You'll have to ask Milosevic, and he'll never tell you'.<sup>100</sup> Nonetheless, an analysis of the main coercive pressures provides some clues, although space precludes a full description of the campaign.<sup>101</sup>

General Clarke identified the Serbian Third Army in Kosovo as the Serbian CoG and directed the Air

Commander, General Short, to 'isolate and degrade the combat capability of VJ/MUP forces in Kosovo'.<sup>102</sup> However, Short dismissed 'tank plinking' as wasted effort which 'did not resonate with policymakers in Serbia',<sup>103</sup> by which he meant that the potential destruction of the Serbian Third Army would not be a high enough price to pay to make Milosevic give up Kosovo. Additionally, President Clinton had declared that 'I do not intend to put our troops in Kosovo to fight a war';<sup>104</sup> in effect, air power was being tasked to 'prepare the battlefield' for a battle that was wasn't going to happen. It is perhaps not surprising that Milosevic was willing to see if he could ride out this particular storm. Aircraft were restricted to a minimum altitude of 15,000 feet to reduce losses, from where they could only target heavy equipment which, without the threat of a NATO ground invasion, was easily concealed. Meanwhile, as part of Milosevic's counter-coercion strategy, Serbian light forces escalated their ethnic cleansing without exposing themselves to air power.<sup>105</sup> When Milosevic failed to concede, NATO appears to have adopted a land-centric strategy of bringing more firepower to bear on the Third Army by deploying more aircraft into theatre. General Short's opinion that the Third Army was an irrelevance had not yet found acceptance. NATO's official tally of equipment destroyed was 93 tanks, 153 armoured personnel carriers (APCs), 389 artillery pieces and 339 military vehicles,<sup>106</sup> although a post-conflict ground survey discovered only 14 tanks, 12 self-propelled guns, 18 APCs and 20 artillery pieces.<sup>107</sup> The House of Commons Defence Committee concluded that 'the relatively poor kill rate against Serbian armour suggests that their contribution to achieving the Alliance's overall coercive objective was, at best, marginal'.<sup>108</sup> Only 38% of UK CAS missions released ordnance (compared with 50% against fixed targets), illustrating the difficulties in attacking mobile targets.<sup>109</sup>

Initially, NATO was badly under-resourced in terms of planning staff and target clearances, resulting in 'campaign by target-list management'.<sup>110</sup> The lack of effects-based targeting analysis did not help Short in convincing the 19 NATO members of the need to attack 'strategic' targets in Serbia;<sup>111</sup> the result was an unintentional

incremental campaign, hitting five to eight targets each night in 'serial' rather than 'parallel' warfare.<sup>112</sup> Milosević's counter-coercion plan of increased ethnic cleansing backfired, generating revulsion and strengthening international resolve. However, Serbian nationalistic reaction to NATO's interdiction campaign resulted in a brief spate of 'human shield' demonstrations on several Serbian bridges.<sup>113</sup> NATO emerged from its fiftieth anniversary summit at the end of April declaring 'whatever it takes, we will not lose';<sup>114</sup> the conflict had developed into a battle of wills. Short finally received permission to 'go after the head of the snake . . . Milosevic, the leadership, the cronies around him'.<sup>115</sup> The political offices of Milosevic and his wife, as well as her propagandist radio and television stations, were attacked. Oil refineries and armament factories, including several owned by Milosevic's cronies,<sup>116</sup> were attacked, making 100,000 civilians unemployed and reducing the economy by 50%.<sup>117</sup> NATO's Land Component Commander told the HCDC that the bombing 'was beginning to hurt that extraordinary politico-commercial Mafia that seems to operate around Belgrade and some of them were not making as much money as they used to.'<sup>118</sup> NATO signatories to Protocol 1 of the Geneva Conventions were unhappy about targeting civilian infrastructure. As a result, the Serbian electrical grid was targeted on 3 and 8 May with carbon-graphite filament weapons, which cut off power to 70% of the country but caused no permanent damage.<sup>119</sup> In late May, however, the US (who are not signatories to Protocol 1) reduced the power grid by 80% using traditional weapons. Leaflet drops emphasized the link between the loss of essential services and Milosevic's policies.<sup>120</sup> The HCDC concluded that 'the effect of the strategic bombing against fixed targets in Serbia . . . was much weightier than the damage being done to his army in Kosovo'.<sup>121</sup>

### Concatenation in Kosovo

Milosevic was subjected to other coercive pressures. KLA activity increased towards the end of the conflict, flushing out the VJ and exposing them to NATO air attack; in early June, B52s targeted VJ concentrations around Mount Pastrik.<sup>122</sup> Nonetheless, the KLA never defeated the VJ.<sup>123</sup> Milosevic had to consider the threat of a NATO

ground invasion, which would reinforce Pape's denial theory; despite Clinton's publicly declared intent not to fight on the ground, on 25 May NATO announced it would deploy 48,000 troops to the region for 'peacekeeping duties', raising the possibility of a ground invasion.<sup>124</sup> Although the HCDC concluded that 'in the absence of a decision by early June to assemble a force for a ground invasion, it is doubtful whether NATO could have mounted and concluded . . . an operation successfully',<sup>125</sup> the implicit threat existed. On 27 May, Milosevic and four of his cronies were indicted as war criminals by the International Criminal Tribunal for the Former Yugoslavia, reducing the likelihood of them obtaining exile abroad.<sup>126</sup> Anxiety levels within Milosevic's inner circle were increased by limiting their ability to leave the country<sup>127</sup> and computer network attacks against their financial assets. However, it is generally acknowledged that Milosevic's failure to secure the support of Russia, leaving Serbia isolated in the international community, was a major factor in his decision to comply with NATO's demands. A source close to the Yugoslavian Government revealed, 'there was tremendous pressure from all sides; the West, his inner circle, and his wife. It was building up, and eventually he just let go'.<sup>128</sup>

### Afghanistan

The 2001 Afghan Conflict was unique in many ways and the application of air power was fundamentally different from previous conflicts. Both sides had different goals and fundamentally different cultures and outlooks. They fought each other asymmetrically, using vastly different techniques. The country had little strategic infrastructure to target, but the religiously fanatical Taliban and al-Qaeda leadership proved difficult to coerce. However, military operations were only one facet of a global anti-terrorism campaign that included diplomatic, legal, financial and humanitarian elements.<sup>129</sup> Afghanistan had been in an ongoing multi-faction civil war since the Soviet withdrawal in 1989. Taliban fundamentalists had gained control of most of the country, although many warlords had coalesced into the Northern Alliance (NA) and posed an ongoing low-intensity threat. Al-Qaeda had a strong influence in the country due to the corrupting influence of their



Sources suggest that the carbon-graphite filament weapons used to disable much of the Serbian electrical grid were released by USAF F-117 Nighthawks

*NATO signatories to Protocol 1 of the Geneva Conventions were unhappy about targeting civilian infrastructure. As a result, the Serbian electrical grid was targeted on 3 and 8 May with carbon-graphite filament weapons, which cut off power to 70% of the country but caused no permanent damage*

financial wealth and the weakness of the Taliban's control over the country.

Operation Enduring Freedom began on 7 October 2001, 26 days after the al-Qaeda terrorist attacks

on the US. It took 78 days to oust the Taliban and al-Qaeda from power.<sup>130</sup> The Taliban had no Integrated Air Defences; their air force existed almost in name only, while their only high-level Surface-to-air Missiles (SAMs) were a handful

of SA-3s.<sup>131</sup> More than 50 cruise missiles were fired in the opening days of Enduring Freedom<sup>132</sup> and medium/high-level air supremacy was achieved after just 48 hours. Thereafter, air power was used to target three target sets: command; military infrastructure; and fielded forces. As the US Secretary of Defense said, Afghanistan 'is not a country that is rich in targets'.<sup>133</sup> Nonetheless, the assets the Taliban and al-Qaeda did possess were critical for coordinating, reinforcing and supporting combat operations. In particular, they were heavily dependent on trucks for mobility.<sup>134</sup> Although only 31,000 Coalition troops were deployed,<sup>135</sup> NA troops were seconded as force multipliers, giving the impression that anti-Taliban Afghans were the main fighting force, while avoiding the perception of 'Western invaders'.<sup>136</sup> The rugged terrain and lack of Coalition artillery meant that there was a high demand for CAS. This played a crucial role in many land engagements, being called in by Special Forces (SF) to destroy enemy infrastructure, facilities and fielded forces.<sup>137</sup> Despite their fanaticism, the Taliban frequently displayed the Afghan trait of initiating bargaining as soon as they came under serious pressure, then changing sides or dispersing and avoiding fighting. Most ground was occupied in this way and 'bombing seems to have had a major impact on their willingness to hold on to positions and fight'.<sup>138</sup> Although air power was relatively ineffective against the leadership, it appears to have been a powerful coercive force at the local, tactical level.

Unlike the other case study countries, Afghanistan is remote. Despite Pakistan's previous tacit support for the Taliban, US diplomatic efforts quickly secured the use of its airfields<sup>139</sup> and eventually 23 countries hosted US forces directly involved in combat operations.<sup>140</sup> Despite the basing of Coalition fighter aircraft in some of these adjacent countries, the majority of air power was projected over a considerable range. Even carrier-based aviation was forced to operate at relatively long range over land-locked Afghanistan. Importantly, the key enabling aircraft were air-to-air refuellers. A brief analysis of the statistics illustrates the point. Carrier-based aircraft flew 75% of the 6,546 offensive sorties between 10 October and 31 December 2001, dropping 43% of the PGMs<sup>141</sup> and about 30% of the 17,471 weapons released.<sup>142</sup>

In contrast, B52s and B1s were employed on only 10% of the offensive sorties,<sup>143</sup> yet dropped 65% of the weapons released and 47% of the PGMs.<sup>144</sup> Pape, an advocate of the tactical use of offensive air power, recommended that air forces should buy 'short-range strike fighters, which can maintain the high operating tempos needed to deliver thousands of PGMs on thousands of targets . . . in other words, air forces would be wiser to buy A-10s and F-15Es'.<sup>145</sup> Enduring Freedom shows that this advice is unsound; US Air Force (USAF) tactical fighters accounted for only 15% of Enduring Freedom's strike sorties.<sup>146</sup> Pape clearly equates 'strategic' bombing with long-range bombers, discounting their tactical use. Yet Enduring Freedom highlighted the utility of these long-range, pervasive bombers which, given air superiority, can loiter for long periods and be cued to engage fleeting tactical targets using PGMs. Indeed, Afghanistan demonstrated the limited range and endurance of US fighter aircraft.<sup>147</sup>

Enduring Freedom saw some of the first uses of time-sensitive targeting and network-enabled capability. Land, air and space Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) assets (including unmanned aircraft) were employed to cue PGM-armed aircraft onto fleeting targets. However, it would be wrong to assume that this nascent capability made the Coalition omniscient. During Operation Anaconda, al-Qaeda made good use of asymmetry by using the mountainous terrain to shield themselves from ISTAR assets. Helicopter-inserted troops were ambushed on landing and found their line-of-sight communications incompatible with the terrain, while satellite communications quickly became saturated. It took B52 air strikes to redress the balance, by which time the terrorists had escaped.<sup>148</sup> Furthermore, ISTAR assets lacked sufficient granularity at the human level and were incapable of distinguishing between civilians, terrorists and irregular soldiers. There were several incidents of innocent people being targeted, possibly due to deliberate misinformation inspired by inter-tribal rivalries. Indeed, following several incidents, Afghan President Karzai publicly implored the US not to rely on local informants alone.<sup>149</sup>



*Even carrier-based aviation was forced to operate at relatively long range over land-locked Afghanistan. Poignantly, the key enabling aircraft were air-to-air refuellers . . . Carrier-based aircraft flew 75% of the 6,546 offensive sorties between 10 October and 31 December 2001*

#### **The 1991 Iraq conflict**

On 2 August 1990, Iraq invaded Kuwait, beginning a conflict that is still ongoing. Although the 1991 and 2003 Iraq conflicts are often considered as two separate campaigns, this paper will examine the conflict holistically as an enduring 13-year-long event. The first phase of engagement was Operation Desert Storm, which began on 16 January 1991 with a six-week air offensive. When the Coalition ground offensive commenced, the Iraqi forces within the Kuwaiti Theatre

of Operations (KTO) began a full-scale rout, culminating in the liberation of Kuwait four days later. Space precludes a full account of Desert Storm;<sup>150</sup> instead, Iraq's counter coercion campaign and the Coalition's leadership, psyops, CAS and air interdiction campaigns will be analysed.

The Coalition achieved air supremacy by 27 January,<sup>151</sup> preventing the Iraqi Air Force from bombing Coalition ground forces and inflicting significant, morale-raising losses on

Coalition aircraft. Indeed, the Iraqis developed such a healthy respect for Anti-radiation Missiles (ARMs) that, 12 years later during Operation Iraqi Freedom, they remained reticent to turn on their SAM radars.<sup>152</sup> Iraq fired 42 Scuds at Israel<sup>153</sup> in an attempt to provoke an Israeli response and demonstrate Iraq's ability to fight back. Israeli retaliation, Saddam hoped, would cause Arab countries to withdraw from the Coalition. Despite having targeting fixed Scud sites,<sup>154</sup> Iraq's mobile Scuds remained active, with the last launch occurring only two days before the War's end.<sup>155</sup> The US deployed Patriot SAMs to Israel and diverted a considerable number of aircraft to the 'Scud hunt'<sup>156</sup> to avoid Israeli intervention. Notwithstanding that *'the actual destruction of any Iraqi mobile launchers by fixed-wing Coalition aircraft remains impossible to confirm'*,<sup>157</sup> Iraq's strategic counter-coercion campaign failed to break the Coalition's cohesion.

Following Iraq's invasion of Kuwait, Warden developed a six-day air campaign called Instant Thunder which targeted the Iraqi leadership and its communications, nuclear, biological and chemical (NBC) warfare facilities, Scuds, air defences, electrical power stations, oil refineries and military factories.<sup>158</sup> Although it was rejected in August 1990 because it ignored Iraqi forces in the KTO,<sup>159</sup> an expanded version of Instant Thunder became the strategic element of the air plan. 'Strategic' attacks during Desert Storm accounted for only 17% of the 43,000 strikes, while leadership, communications and power station targets accounted for less than 3%.<sup>160</sup> 'Brute force' was applied to some targets, such as the Scuds, NBC and military production facilities, to degrade Iraq's future offensive capability. However, the leadership, oil production and power station targets were meant to produce 'strategic paralysis'. It has been claimed that the counter-leadership campaign failed because Iraqi sovereignty was never threatened.<sup>161</sup> However, the post-conflict Shia and Kurd uprisings suggest that anti-regime elements of the population perceived the regime to have become vulnerable, despite Saddam's repressive secret police. Overall, the effectiveness of the counter-leadership campaign remains unclear.

Psyops against Iraqi forces in the KTO were decisive, influencing 87,000 troops to surrender and 160,000 to desert.<sup>162</sup> Coalition radio broadcasts began in November 1990, followed by leaflet drops and loudspeaker broadcasts from 16 January 1991.<sup>163</sup> With air supremacy, B52s, invulnerable at high level, began a daily cycle of leaflet drops and carpet bombing. Leaflets were often addressed to individual units and gave the time of the next bombardment, reinforcing the perception of Coalition omniscience and creating expectancy.<sup>164</sup> F111 bombers targeted tanks in the KTO using laser-guided bombs, denying them as sanctuary; their 'precision and focus', combined with psyops telling Iraqis to stay away from vehicles, demonstrated that the Coalition was not targeting the Iraqi people. Iraqi death squads executed deserters and anyone found with leaflets, leaving troops with the option of enduring the bombing or deserting and risking execution. Prisoners of War (POWs) revealed that 98% of them were exposed to leaflets, while 58% heard broadcasts, influencing 46% of them to give up.<sup>165</sup> However, B52 raids caused most desertions.<sup>166</sup> Most POWs described their combat effectiveness at the beginning of the ground offensive as zero.<sup>167</sup> Only 28 of the 1,400 vehicles destroyed during the Iraqi retreat along the 'Highway of Death' were armoured,<sup>168</sup> indicating that the individual soldiers' will, rather than their leadership, had been shattered.

Because of the short duration of the ground offensive and the lack of Iraqi resistance, CAS was a peripheral aspect of the campaign. CAS aircraft saw relatively little action; despite the number of targets available, only 61% of sorties released weapons. The Gulf War Air Power Survey concluded that *'Air power's greater effectiveness was in attacking the forces deeper in the Iraqi defense areas, in the regions where these attacks blended in with the interdiction strikes'*.<sup>169</sup>

Pape believes that air power thwarted Iraq's strategy by shattering the will of the frontline troops, destroying large amounts of equipment and immobilizing Iraq's mobile reserves.<sup>170</sup> Strikes damaged or destroyed 55 bridges leading to Kuwait.<sup>171</sup> Nonetheless, large logistic stockpiles were found in Kuwait after the war, although



*Only 28 of the 1,400 vehicles destroyed during the Iraqi retreat along the 'Highway of Death' were armoured, indicating that the individual soldier's will, rather than their leadership, had been shattered*

attacks against distribution vehicles within Kuwait deprived many units of these supplies.<sup>172</sup> The US estimated that 39% of Iraqi tanks, 32% of APCs and 47% of artillery within the KTO had been destroyed prior to the ground invasion,<sup>173</sup> reinforcing Pape's 'denial' theory that Saddam was coerced 'to leave Kuwait prior to the ground campaign because air power had devastated his army and he wanted to save what was left of his forces'.<sup>174</sup>

Following Kuwait's liberation, Coalition forces withdrew from Iraq. In response to an appeal by the United Nations,<sup>175</sup> the US, UK and France imposed No Fly Zones (NFZ) over Northern and Southern Iraq in April 1991 to protect Kurdish and Shiite refugees. These NFZs were patrolled almost every day for the next 12 years which, combined with sanctions, prevented Iraq from projecting power outside its borders. By August 2002 nearly 300,000 NFZ sorties had been flown,<sup>176</sup>

during which both sides gathered intelligence on each other.

### The 2003 Iraq conflict

Following the Afghan Conflict, the US turned its attention to Iraq. Operation Iraqi Freedom began on 19 March 2003. This high-tempo assault overwhelmed Iraqi defences, toppling the regime within a month. It began with a rapidly planned decapitation attack on a Baghdad bunker, believed to be occupied by Saddam and his sons.<sup>177</sup> Post-war analysis revealed that the intelligence was incorrect; the bunker did not exist.<sup>178</sup> This attack was part of a campaign to '*destabilize, isolate, and overthrow the Iraqi regime*' by targeting the top 55 members of Iraq's leadership. As yet, very little data on Iraqi Freedom has been released. However, 9.8% of combat sorties were dedicated to suppressing the '*Iraqi Regime's ability to command Iraqi forces and govern [the] State*'.<sup>179</sup> Television producer Eamonn Matthews alleges that all of the 50 successfully executed attempts to target Iraqi leaders failed.<sup>180</sup> On 7 April, intelligence intercepts of a satellite telephone located '*extremely high level players within the Ba'th Party*' in Baghdad to an accuracy of about 100 ft. Two buildings were bombed. Eighteen civilians were killed, none of them Ba'thist leaders. An unsuccessful attempt to assassinate Iraq's Southern Region Commander by bombing his residence resulted in 17 civilian deaths. A US Defence Intelligence Agency officer concluded that '*these leadership strikes led to the highest number of casualties in the air war*'.<sup>181</sup> Nonetheless, Iraq's regular forces had great difficulty in coordinating coherent resistance against the high-tempo US/UK offensive,<sup>182</sup> which the decapitation campaign must have contributed to. Despite 12 years of US/UK intelligence gathering, the intelligence failures extended further than the targeting of individuals. The Coalition Weapons Effect Analysis Team that conducted a detailed post-conflict ground survey found that '*a significant number of targets were not what we thought they were - several were demonstrably not military facilities*'.<sup>183</sup> Overall, the capability to target buildings outstripped the ability to determine their function.<sup>184</sup> Additionally, the US/UK battle damage assessment process largely collapsed early in the conflict, making the timely

assessment of Iraq's combat capability difficult.<sup>185</sup> The UK has acknowledged that improved methods of accurately measuring the effectiveness of effects-based targeting are required.<sup>186</sup> Furthermore, the UK Secretary of State for International Development opposed the war, making inter-Ministry planning for post-conflict reconstruction '*challenging*'.<sup>187</sup> and accused the Prime Minister of allowing the UK to '*rush to war . . . without defence and overseas policy meetings*'.<sup>188</sup> The intelligence limitations and lack of 'joined-up government' bring into question the current viability of EBO.

The main effort of the air campaign was to defeat or compel the capitulation of Iraq's Regular Army and Republican Guard; 79.6% of targets fell into this category, of which all but 1.5% were mobile.<sup>189</sup> However, only 32% of RAF CAS sorties released weapons, compared to 73% for fixed targets,<sup>190</sup> highlighting the British Army's '*inability to provide sufficiently accurate co-ordinates for mobile targets*'. The UK has acknowledged that it lacked experience in requesting, coordinating and delivering CAS missions.<sup>191</sup> Although US CAS data is not yet available, a General Accounting Office study released before Iraqi Freedom found that the Army lacked CAS training, while the USAF focused excessively on longer-range interdiction missions.<sup>192</sup>

Iraq's counter-coercion campaign was extremely limited. Although 10.2% of US/UK combat missions were dedicated to hunting Surface-to-surface Missiles (SSMs),<sup>193</sup> the expected Scud launches never occurred. Twelve Al-Samoud and Ababil-100 SSMs were launched at Kuwait, 9 of which were intercepted by Patriot SAMs.<sup>194</sup> However, the threat these SSMs posed to the assembling US/UK ground forces in Kuwait may have caused the ground offensive to be launched earlier than planned. Prior to Iraqi Freedom, US/UK NFZ patrols had begun to suppress Iraq's air defences.<sup>195</sup> The Iraqi Air Force did not fly during the conflict. Overall, Iraq's air defences proved unwilling to protect their fielded forces.<sup>196</sup> The 1991 Conflict had apparently taught the Iraqi air defences to respect ARMs; the US fired only 408 HARMs<sup>197</sup> in 2003 compared with 1,961 during Desert Storm<sup>198</sup> and only 7.2% of

attacks were dedicated to 'maintaining air and space supremacy'.<sup>199</sup> The effect of 12 years of NFZs and sanctions took its toll on Iraq's defences, as demonstrated by the SAM launcher propped up by bricks in **Figure 5**. Iraq deployed at least 4 electronic jammers to deny the US/UK their use of the Global Positioning System, but these were destroyed early in the conflict.<sup>200</sup> Squatters occupying the Air Defence Operations Centre in

Baghdad revealed that the building had been abandoned about a week before the conflict,<sup>201</sup> while the operations board in the Air Defence Sector Operations Centre at Taji indicated that the facility was abandoned on 9 March (**Figure 6**). Attacks by Fedayeen irregulars became Iraq's main counter-coercion tool, which air power had difficulty in targeting.

Bricks propping up launcher

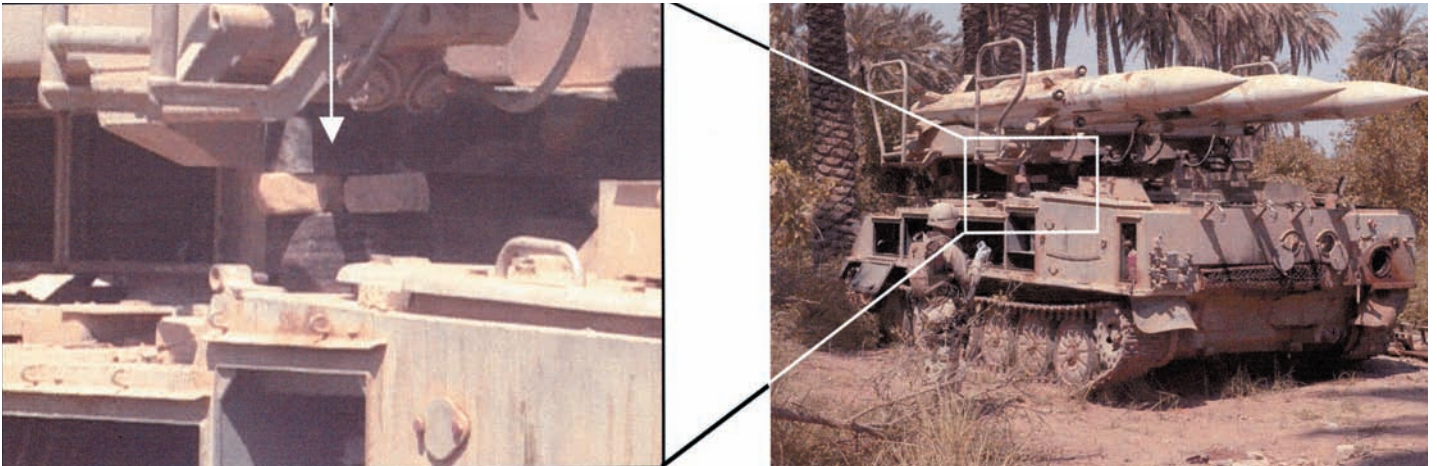
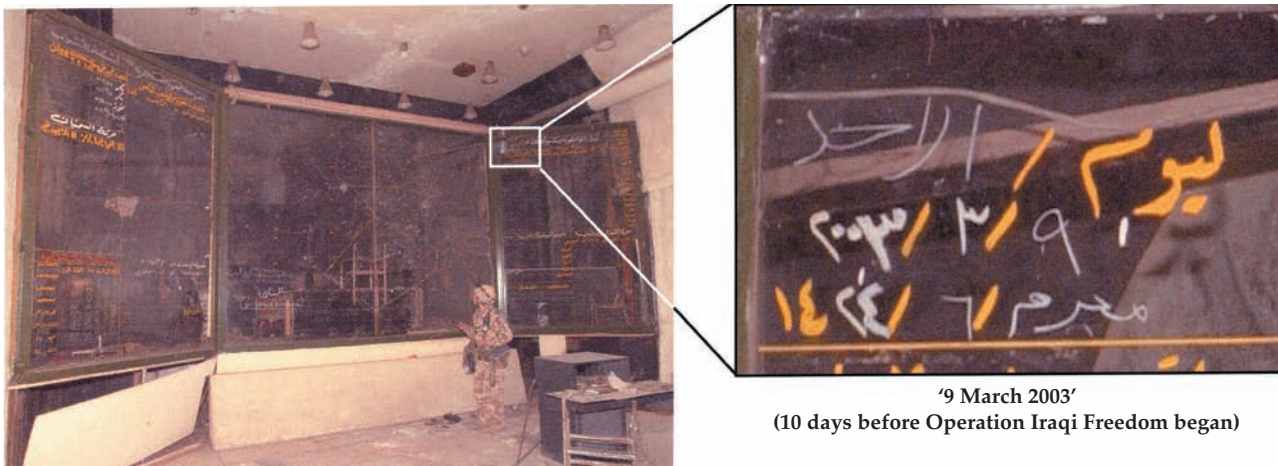


Figure 5. Iraqi SA-6 SAM launcher showing poor state of maintenance



'9 March 2003'  
(10 days before Operation Iraqi Freedom began)

Figure 6. Taji sector operation centre operations board showing date that the facility was abandoned

## Conclusion

These six case studies were all unique in some way. While it is dangerous to attempt to solve paradigm debates based on this small empirical sample, pulling the threads together is, nevertheless, revealing. The strategic air strikes against Libya achieved little long-term effect other than making Libya more covert in its support of terrorism. Warden's 'strategic paralysis' campaign in the 1991 Iraq Conflict seems to have been less decisive than the 'denial' strategy against Iraq's forces in the KTO. Similarly in the Bosnian Conflict, Milosevic realized the ground war could not be won when the 'denial' strategy against the BSA shifted the balance of power in favour of the BiH. However, the targeting of the Serbian Third Army in Kosovo was ineffective, probably because of the lack of a ground threat. Political constraints within NATO resulted in an unintentional escalatory 'risk' campaign of increasing strategic effect; Milosevic conceded when he was subjected to too many pressures from too many sources, although he retained sufficient military forces to defend Kosovo. In Afghanistan, air power appears to have been highly effective at the tactical rather than strategic level. SF, air power and indigenous ground troops worked in a highly successful and very cost effective, synergy. Air power and SF worked as force multipliers for a predominantly indigenous land force. This strategy should be employed whenever the circumstances are appropriate, as the minimal numbers of foreign 'occupation' troops adds legitimacy to the operation and is more likely to engender the support of the local population. Finally, in the 2003 Iraq Conflict, air power appears to have been effective at achieving the annihilation of Iraq's regular ground forces, and possibly strategic paralysis. The physical effect against ground forces is certainly easier to assess than the coercive effect on Iraq's leadership. However, since regime targets accounted for less than 10% of all combat sorties, the potential gains to be had from targeting the leadership are almost certainly worth the modest effort. Interestingly, CAS played little or no part in Libya, Iraq in 1991, Bosnia and Kosovo, but was prevalent in Afghanistan and Iraq in 2003. However, it is evident that CAS suffers from a low weapon release rate compared to attacks against

pre-planned targets. Another consistent thread is that aircraft platforms can no longer be equated with air power roles; a B52 'strategic' bomber can be used for tactical CAS, while an F16 can be tasked with 'strategic' regime targets.

Further distillation reveals significant trends. It is apparent that many conflicts start with tactical targeting of the enemy's physical component (his means of fighting), but conflict termination and the ensuing peace appears dependent on the moral component - a coercion / counter-coercion battle of wills. All the case studies demonstrate that the concatenation of coercive pressures from diplomatic, economic, psyops, media and information operations, strategic and tactical military effects can overwhelm an opponent and cause him to concede defeat. This can theoretically be achieved by a robust effects based campaign, although the accuracy of PGMs has developed faster than both the accuracy of intelligence gathering and our ability to measure the effects we are inflicting on our opponents.

Coercing the fielded forces appears to be effective in wars of territorial gain, such as Iraq in 1991, Bosnia (where the BiH fought for territory) and Afghanistan. However, in non-territorial conflicts (such as in Kosovo, where the KLA were never strong enough to challenge the Serbian Third Army) coercing the fielded forces appears to be ineffective. In contrast, while targeting for strategic effect always contributes to coercive concatenation to some degree, it becomes pivotal in non-territorial conflicts such as Kosovo. Generally, the high potential payoff from strategic effects, combined with the small number of sorties required to produce them, means that they should be included as part of an air campaign wherever possible. The selection of the correct audience to coerce (be it the leadership, fielded forces or population) is paramount - a selection that can only be made after a detailed analysis of the relative strategic influences of these groups and their vulnerabilities to the coercive tools available. In sum, air power must be able to produce both strategic effect and provide tactical support for friendly ground forces - the nature of the conflict dictates the most appropriate balance of effort. The ability to find the correct balance is one of the keys to air power.

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