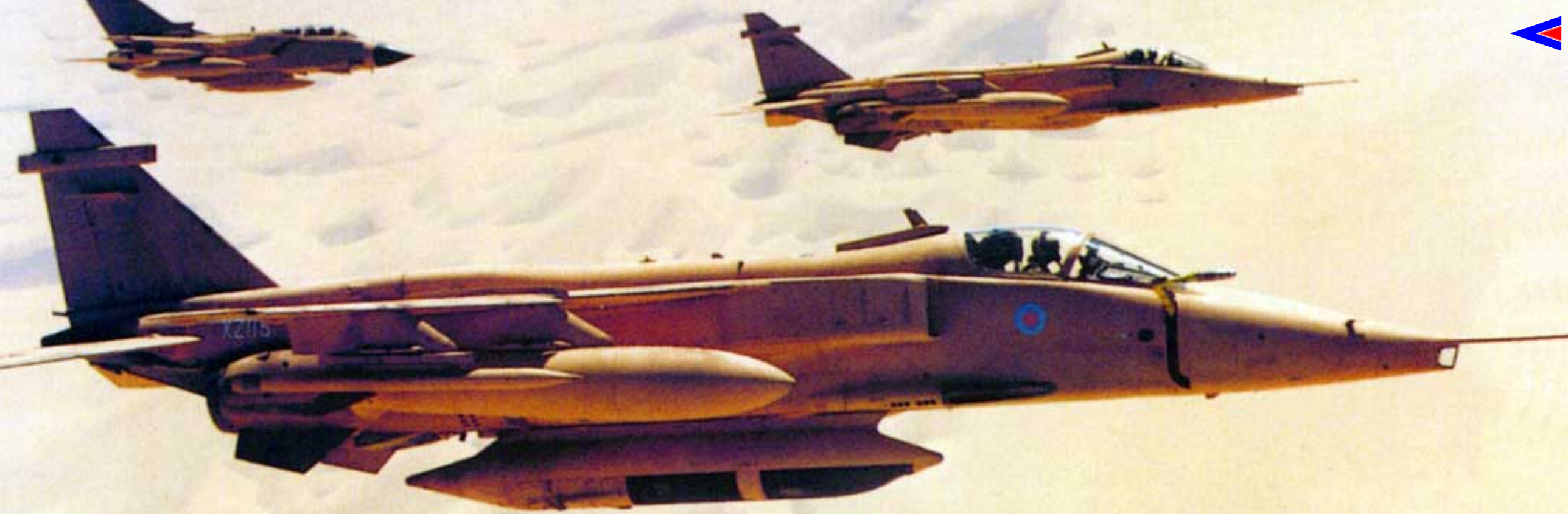


# Air Power in the Modern World

## Myths and Challenges

By Group Captain Peter W Gray, Director of Defence Studies (RAF)



The legacy of the Gulf War, following hard on the heels of the bloodless victory of the Cold War, has left western society with a stylized vision of modern warfare. Technology is now seen as being master of all situations. Stunning victories can be achieved with minimal loss to one's own side and with greatly reduced collateral damage to those innocents who are collocated with the foe. Warfare can now be delegated to the modern day knights who have exchanged their gleaming helmets and plumes for polycomposite versions with Star Wars-style black visors. That their steeds are now multi-million pound (or more often dollar) aircraft is at the heart of the public perceptions of the use of air power in modern warfare. But these perceptions are almost totally western orientated. It is unlikely that the Serbs would see modern air power in such a rosy, soft-focus light. Nor would the residents of Grozny accept the concept of damage-free warfare. The marsh Arabs and Kurds in Iraq would hardly sympathise with the viewpoint that air power is protecting them from the harsh realities of life under Saddam Hussein – nearly ten years after the restoration of sovereignty in Kuwait.

The advent of a new century has not seen the world become a safer place. Nationalism and ethnic strife is as much a threat to stability as it ever has been. Territorial acquisitiveness remains a spectre in the background of international relations, with the desire to unite peoples within common borders as high on the agenda as it has been since the formation of the nation state.[1] Racism, and fear of intolerance, are ever-present below the thin veneer of our apparently civilised lifestyles.[2] The natural desires, especially in impoverished nations, to match western prosperity has done little to help the occupants to cope with natural disasters. If anything, expenditure on western military goods or the trappings of so-called civilisation has left indigenous people more vulnerable.

Against such a backdrop of doom and desolation, what are the challenges facing air power in the modern world and in modern warfare? This paper seeks to highlight ten key areas where a myth needs to be exploded or a major challenge faced up to. Every myth that requires dismantling prior to tackling the challenge inevitably doubles the scale of the task facing the air power theorist. Such a task is, however, vital if we are to prevent our strategic level doctrine from solidifying into dogma.[3]

For some reason, ten seems to have a magic resonance only possibly exceeded by the number seven. Beyond the inevitable biblical references to commandments, warfare and air power have enjoyed their fair share of rules of ten. There are ten Principles of War that have been enumerated over the years in high level doctrine documents.[4] Tedder enumerated ten principles of air power.[5] Colonel Philip S Meilinger USAF has also enumerated his *10 Propositions Regarding Air Power*[6] and Dr Grant Hammond has outlined ten 'lessons not to learn' from the Gulf War.[7] The ten areas of challenge for the next decade have been chosen to stimulate debate, rather than merely to expound the virtues of air power. Throughout the ten myths or challenges, it will become evident that a common theme emerges – that whatever the task – air power makes what can often be a significant difference to the way in which we fight a war.

## AIR POWER CAN DO IT ALONE – DOUHET, TRENCHARD AND MITCHELL ARE ALIVE AND WELL

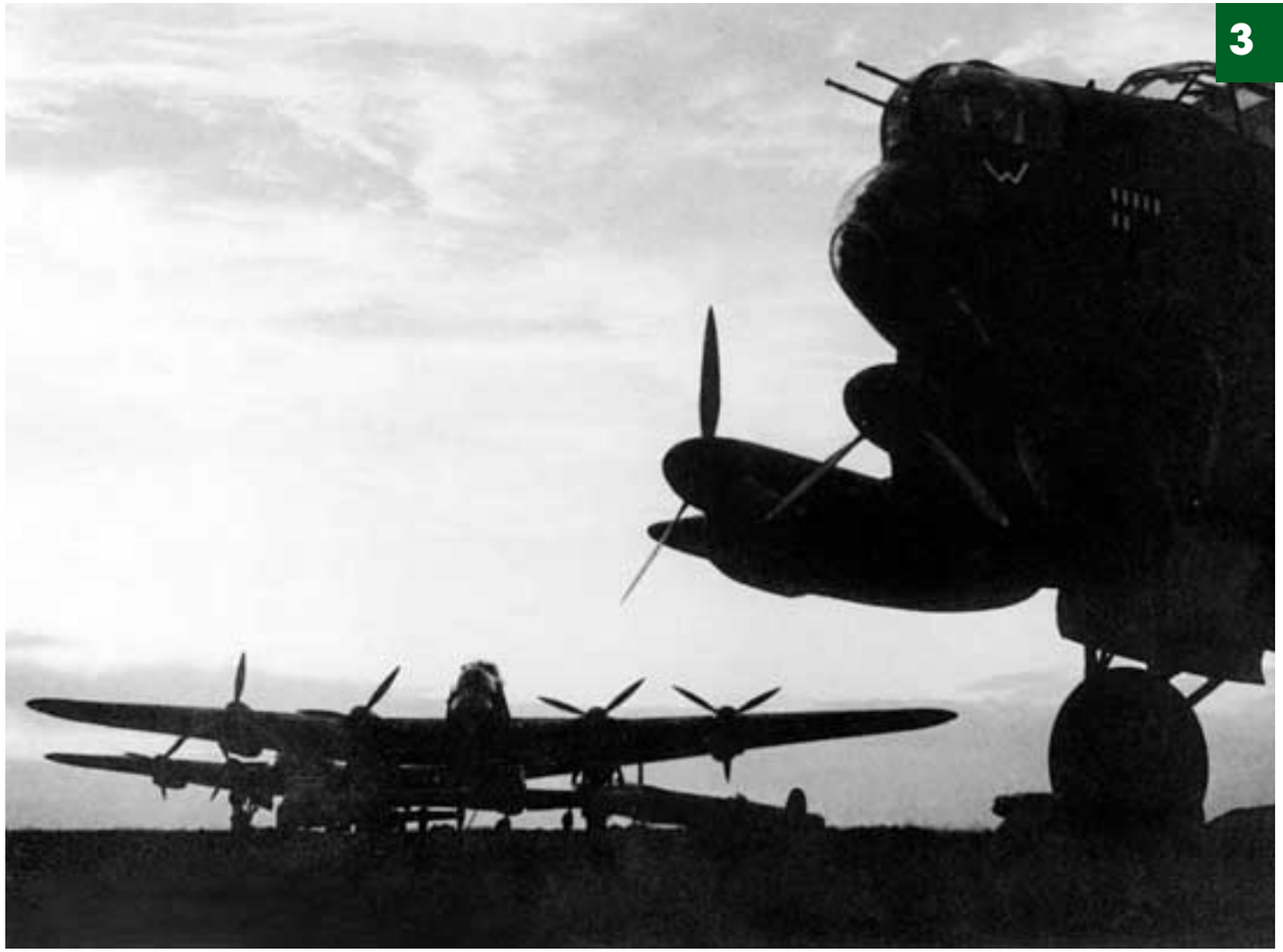
The aftermath of the First World War left an indelible mark on all of those who had been touched by the conflict; indeed the scale of the event left few unscathed. Many believed that war as an institution should be banned in *toto*. Others contended that the recent extension to the third dimension would obviate the necessity for trench warfare with its terrible toll in human suffering. The Royal Flying Corps had suffered serious losses,[8] especially given the difficulties in training sufficient crews to man the aircraft that were being produced in increasing quantities.[9] But these casualties were on a different scale to trench warfare and the emerging perception was that a fleet of self-defending bombers would be able to take the battle direct to the enemy's homeland with impunity. The Italian air power theorist Douhet wrote in *The Command of the Air*[10] that warfare was essentially a battle of wills between two peoples; the flexibility offered by air power would allow offensives to 'be aimed mainly at the morale of civilians'.[11] Trenchard, probably without having read Douhet,[12] channelled his predilection for the offensive by arguing that the best way to defend the United Kingdom

*...Douhet wrote in* The Command of the Air *that warfare was essentially a battle of wills between two peoples; the flexibility offered by air power would allow offensives to 'be aimed mainly at the morale of civilians'*

would be to attack the enemy on his bases and in his factories – his vital centres. Trenchard endorsed the importance of targeting 'morale' by stating that it outweighed the physical by a factor of 20:1. Stanley Baldwin summed up the widespread belief in the House of Commons in 1932 stating that 'the bomber would always get through'.[13]

The realities of Second World War technology were such that the bomber did not always get through, and thousands of lives were lost in aerial and ground warfare. Air power had played a vital role in many areas from, ironically, the defence of the UK during the Battle of Britain to the Bomber campaign. But it could not claim to have done it alone. Although the attacks on Hiroshima and Nagasaki again raised the possibility of outright supremacy for air power as the means of ultimate warfare, the vast majority of scenarios for the Cold War included all arms of conventional warfighting.

The bloodless end to the Cold War was followed by the Iraqi invasion of Kuwait, Desert Shield and the Desert Storm. The successful conclusion of the campaign to expel Saddam Hussein's forces from Kuwait drew appropriate eulogies such as 'Gulf Lesson One is the value of air power' from President George Bush and 'The air campaign was decisive' from Secretary of Defence Dick Cheney.[14] No theorist would denigrate the outstanding value of air power in this campaign, but nor would they claim that it had, or could have, accomplished the goals alone.[15]



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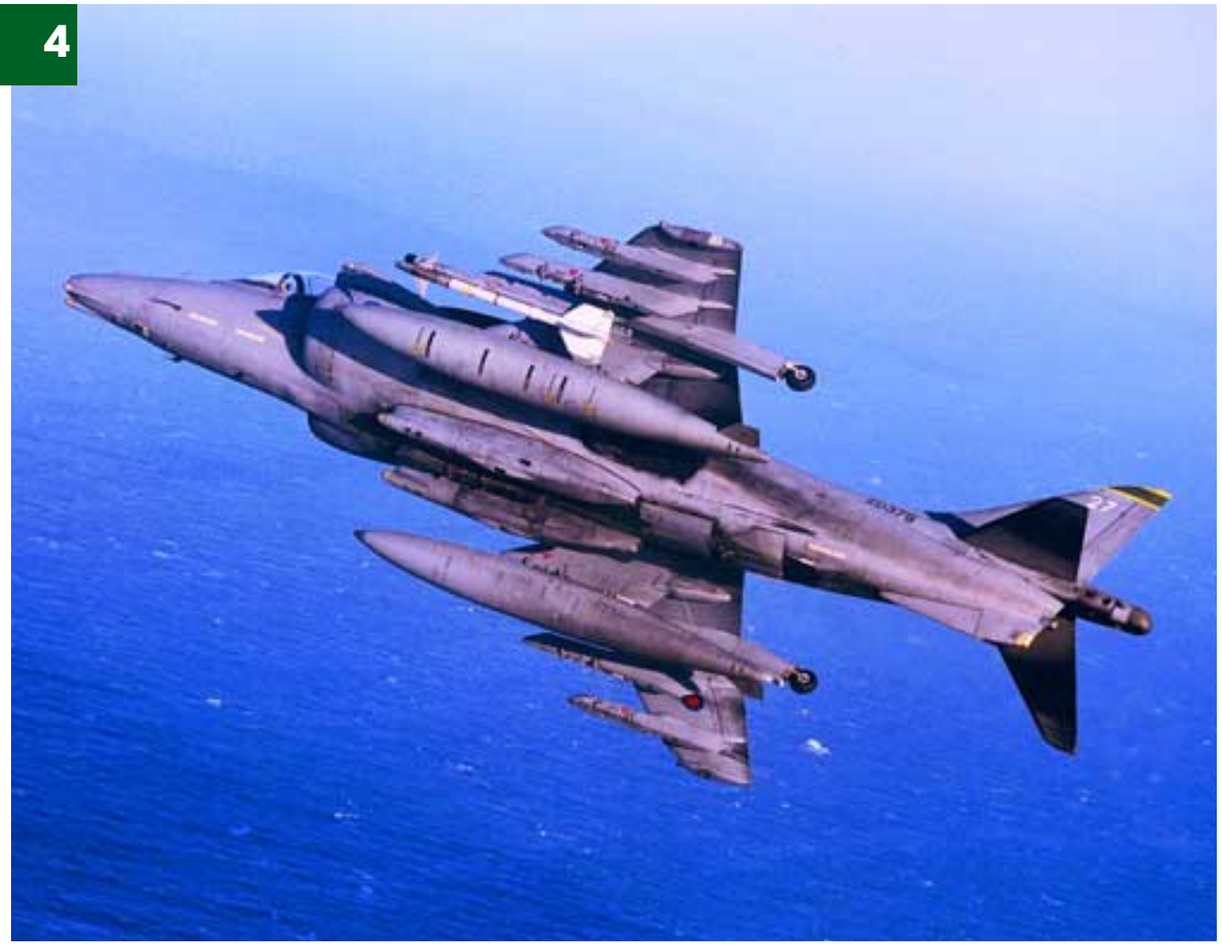

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The subsequent use of air power in Operation Deliberate Force in Bosnia in 1995 highlighted the dilemmas facing political leaders and coalition partners in making effective use of modern technology in internecine strife – particularly in full media view.[16] Air power had the ability to demonstrate political will, whilst allowing the statesman 'to engage in hostility by increments'.[17] But it also left the problem of what to do after air strikes had been used, foreshadowing the air operations that were to follow over Kosovo in 1999.

Air operations over the Balkans commenced on 24 March 1999 and continued for the next 78 days. What had started as a short and sharp operation aimed at bending President Milosevic's will became a lengthy battle of nerves. The debate in the press centred around those who thought that air power alone could deliver versus the 'armchair generals'[18] who steadfastly maintained that the insertion of ground forces would be essential to success. Whether or not this debate did more than merely fill column inches, it is probably sufficient to say that the most notable conversion was that of John Keegan, the defence editor of the Daily Telegraph and an eminent military historian.[19] Needless to say, the more outspoken disciples of air power had a field day. More reasoned exponents of the art, however, counselled caution reminding readers, in the words of CAS, that 'Operation Allied Force was a joint operation in which alliance navies and armies as well as air forces made their own contributions'.[20] The author of the prestigious American Air Force Association Special Report confirmed that the 'campaign' was decisive and that aero-space power was 'dominant', but added that the air campaign 'works as the centrepiece of joint operations'.[21]

Despite the hopes of the optimists, the use of air power in Operation Allied Force was but part of the whole campaign. Analysis of all of the major conflicts, as well as many of the minor ones, shows that air power has often been decisive and occasionally dominant (at least for parts of the campaign): but it has never been the sole means of successfully prosecuting war. That said, air power has almost invariably made a significant difference to the conduct of warfighting when it has been employed in a thoughtful manner. Air power may or may not take the place to the Right of the Line, but its use will feature heavily in the political-military decision-making process.

## AIR POWER IS THE WEAPON OF FIRST POLITICAL CHOICE

The dust had barely settled after the collapse of the Berlin Wall before the financiers in treasuries across NATO were demanding their peace dividends. Squadrons of aircrew destined for the Gulf were deployed unsure as to whether their unit number plates would still exist on their return. The failure to materialise of the new world order has almost invariably left armed services with considerable overstretch in manpower terms and a massively expanded horizon with which to cope.[22] The inherent flexibility and reach of air power gives the political or military policy maker unprecedented scope to project influence in a timescale that is close to the decision making cycle of the world media circus. But as James Cable has pointed out, there is far more to the limited exercise of coercive force for political ends than is encompassed in the term ‘gunboat diplomacy’.[23] The dispatch of military force to the latest trouble spot must therefore be accompanied by a comprehensive assessment of the problems likely to be facing the troops of whatever service is involved – the military estimate process

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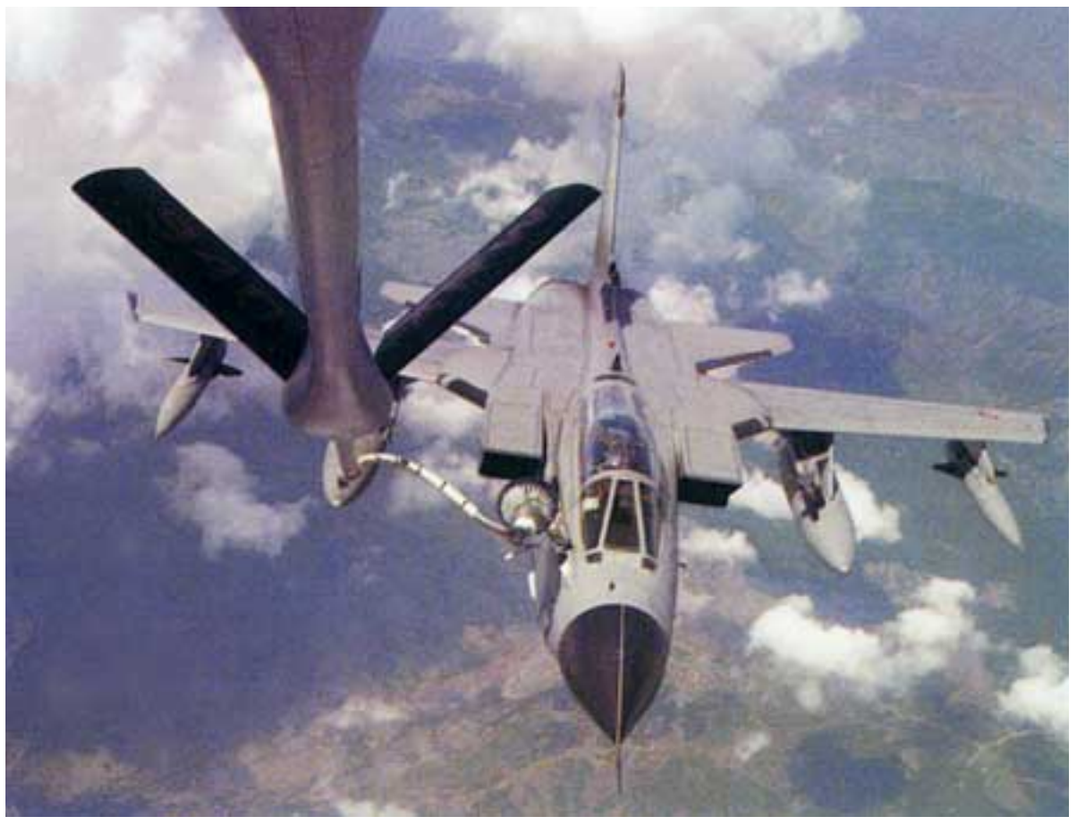

is designed specifically to ensure that this is in place. Air power may be the weapon of first political choice, but few, if any, political or military eventualities can be solved by it alone. Demonstrations of will or political support can be displayed, but many of the peacekeeping or peacemaking situations that are now so prevalent demand the employment of troops on the ground. Similarly, air power is only of limited utility in situations requiring aid to the civil authorities (such as Northern Ireland).

Eliot A Cohen has written that 'Air Power is an unusually seductive form of military strength, in part because, like modern courtship, it appears to offer gratification without commitment'.[24] That such graphical gratification as can be demonstrated by air power may be readily available to political leaders seems almost too good to be true in a resources-scarce era in which national interests or survival are not directly threatened. In virtually every situation likely to face a national government, air power will be of lesser, or more likely greater, utility to the government of the day. The role may be surveillance, refugee assistance or the delivery of precision ordnance and it will almost certainly make a significant difference.

## AIR POWER PROVIDES A SURGICAL STRIKE CAPABILITY WITH ZERO CASUALTIES

A surgical strike capability has long been the Holy Grail of air power enthusiasts. It came close to reality, in a very limited form, in the days of colonial control in Iraq. Small flights of aircraft operating in a benign environment (in terms of hostile fire at least) would drop small bombs from about 100ft on an individual house, usually without incurring casualties.[25] This means of warfare was fine against a relatively unsophisticated enemy, but did not lend itself to the coming battles of nations. During World War II, technology was insufficiently advanced in terms of both bomb load and accuracy – particularly when the lack of fighter escort forced bombers to operate by night. The USAAF plan by which key nodal points in the German economy would be attacked was predicated on accuracy then unobtainable.[26] It was only in the later days of the Vietnam conflict that the step-change in weapons delivery occurred with the introduction of precision guided munitions.[27]

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Perceptions of events in the Gulf War, accentuated through the lens of the world's media, left planners for the Kosovo air operations with little choice other than to use precision weaponry. The realities, however, are that only 8% of the missiles and bombs used in the Gulf War were precision guided.[28] They nevertheless captured the imagination of the press and public, possibly because the weaponry and its outcome appeared more 'politically correct' than images of bombs raining down from B52s reminiscent of Vietnam. During the Kosovo air operation some 35% of the 23,000 bombs and missiles used were precision guided. Increased accuracy may also have stemmed from improved avionics.[29] The pressure for absolute accuracy is, however, unmistakable and it may well be that the day is not far removed when the 'dumb bomb' becomes a weapon of last resort. Indeed the pressure on military commanders and servicemen at all levels is considerable; during the Kosovo air operation threats of war crimes investigation were made in respect to the conduct of the bombing.[30]

There is therefore a presumption of accuracy and precision. Indeed, as Anthony Cordesman has pointed out, wars such as the Kosovo conflict are raising the expectation of political leaders, the military, the press and the public that 'every casualty is a mistake and significant numbers of casualties is a failure'.[31] But accuracy can never be pinpoint or absolute. Mechanical or electronic malfunctions occur; or equipment may be vulnerable to counter measures. Most weapons have their accuracy measured in terms of the diameter within which 50% of the rounds will land; the author would not care to have a vasectomy or other surgery to this level of accuracy. Nor can precision bombing entirely eradicate collateral damage or casualties. Some 1200 people were killed in Serbia during the Kosovo air operations and the lives of many more severely influenced by the bombing, *inter alia*, of the bridges over the Danube.

The bottom line remains, however, that weaponry has become hugely more effective than that used in the days of imperial policing. Accuracy has increased many fold and effects-based targeting, dreamt of by Bomber Command and the USAAF 8th Air Force, has become something close to a reality.

## AIR POWER IS GLAMOROUS AND MEDIA FRIENDLY

The relations between the military and the media may not have always been totally fraught, but when they have been less than cordial they have resulted in a veritable rain forest of literature on the subject.[32] At the core of this is the apparent conflict between the indomitable seeker of truth and the distrustful, secretive warrior.[33] This can be exacerbated by lack of training and, conversely, by occasional devious methods of enquiry. Furthermore, some members of the press are deeply suspicious of any briefing that they suspect as being part of the Psyops campaign; the military inevitably see this as being integral to their campaign. Where no information is forthcoming, speculation is rife – often to the detriment of both security and accuracy

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of reporting.[34] Wherever the fault, there can be no denying that there is considerable press and public interest in any conflict. During the air operations over Serbia in Spring 1999, newspaper circulation increased in the early days of the operation by some 15%, reflecting the level of public interest. War weariness took its toll later.[35] In the aftermath of the conflict, the Royal United Services Institute held, as part of their lecture series, briefings by Lord Robertson the Defence Secretary[36] and later by Alistair Campbell, the Prime Minister's press secretary. That the audience for the latter was some 50% greater than the former speaks volumes for the press's own interest in media handling.[37]

With press interest at an all time high, and air power arguably at its most photogenic, the opportunities for commanders to take the initiative are considerable. But the press always appears to be inside the military decision making loop and this should be reversed.

## AIR POWER CAN PROVIDE HIGH TECHNOLOGY RESULTS WITH A MINIMAL SUPPORTING TAIL

*During Allied Force, the scale of effort required of the United Kingdom's ageing tanker force in support of RAF and allied aircraft was considerable*

In his article in the *Royal Air Force Air Power Review*, General John Jumper (Commander USAFE during Operation Allied Force) warned of the dangers of learning generic lessons from such an idiosyncratic campaign as that fought over Kosovo.[38] The one lesson that we must learn from Kosovo, however, was that air forces disregard Combat Support Air Operations at their peril.[39] The role of air-to-air refuelling in any air operation is vital. The days of being able to operate from home base, carry out a mission and return in best Blackadder style for 'tea and medals' are long gone. The realities are of long range sorties involving several tanker brackets. During Allied Force, the scale of effort required of the United Kingdom's ageing tanker force in support of RAF and allied aircraft was considerable. Similarly, the effort required to move the American Apache aircraft from Germany to Albania was in excess of 500 C17 sorties. Air transport was stretched to the limit in sending supplies to theatre and moving within

local boundaries; this capability includes the often vital ingress of special or air mobile forces. Suppression of Enemy Air Defences (SEAD) and Electronic Warfare (EW) are equally vital functions, but are seldom available in sufficient quantities. Similarly, the rescue of downed aircrew is now expected by politicians and military leaders alike; but the resources required, including SEAD, EW and specialist lift assets, should not be underestimated. It may be that the more widespread introduction of stealth aircraft will reduce dependence on EW and SEAD; but the realities of coalition operations are such that our reliance on these assets will remain a major planning factor. If air power is to make the difference in a conflict that we have now come to expect, the Combat Support area must be resourced to the same scale as the fighting or combat units. Otherwise, expeditionary warfare without the means of power projection can be but a dream.

## AIR SUPERIORITY IS NO LONGER A PREREQUISITE – IT WILL BE CEDED

The sentiment that if control of the air is lost, the battle follows very shortly thereafter has been widely expressed. It was implicit in the writings of many of the inter-war air power theorists; World War II generals such as Montgomery and Rommel were adamant in their views as to its necessity. More recent conflict in Korea, Vietnam and in the Middle East merely served to accentuate the vital nature of control of the air. After the Gulf War, and more recently Kosovo, however, a school of thought has arisen that air superiority can be taken for granted, or that it will be ceded without a fight. That these arguments often come from those who begrudge the share of the budget that goes to fighter procurement (whether it is a Eurofighter or an F22) only serves to make the debate more acrimonious. Ironically the rancour engendered makes the whole round of debate less productive than otherwise would be the case.[40]

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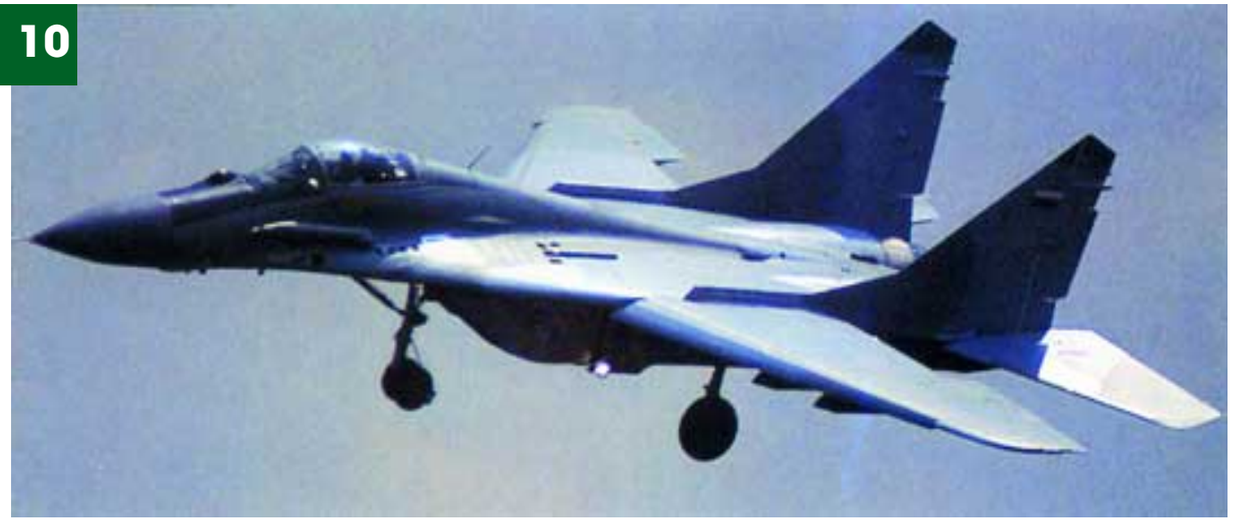

*During Allied Force, the US Department of Defense reported that 85% of Serbia's Mig 29s had been destroyed, along with 35% of its Mig 21 fighters*

The reality of both Kosovo and the conflict in the Gulf (which is still continuing) is that control of the air had to be fought for, won and then maintained. In Iraq, the conduct of the ground operations in the 100 hour offensive would have been vastly different had there been a challenge to allied air supremacy. During Allied Force, the US Department of Defense reported that 85% of Serbia's Mig 29s had been destroyed, along with 35% of its Mig 21 fighters.[41] Those that remained had been well dispersed and protected leaving a still potent military capability. Had these aircraft been able to operate, air operations over Serbia would have been considerably more hazardous – an important factor when allied cohesion was its centre of gravity and losses could have led to its unravelling. In short, having control of the air makes a considerable difference to the conduct of a campaign – losing it makes a huge difference.

## IMPORTANCE OF C2/C4I

It is a truism of the simplest nature to stress that command, control and intelligence have always been vital to the conduct of military adventures. The importance of 'knowing just what is around the next hill'; the formulation of a coherent plan; its dissemination down a clear chain of command; and then the wherewithal to cope with unexpected reverses are all traits that we should be able to take for granted after the years of theorising on such topics. But the reality is that these lessons have so often had to be relearned as each successive conflict has revealed that peacetime structures are not necessarily conducive to warfighting.

*The greatest challenge, arguably, as we enter a new century is coping with the plethora of command links available to the modern commander*

The greatest challenge, arguably, as we enter a new century is coping with the plethora of command links available to the modern commander. As technology enables us to reduce the Boyd OODA loop[42] to close to real-time delivery of weapons onto a newly detected target, so the surveillance and communications links allow increasingly senior levels of command to be privy to the tactical situation. This may be desirable in some circumstances, but to many participants it represents a down side to the so-called revolution in military affairs.

## DOCTRINE IS NO LONGER RELEVANT

Professor Richard Overy has suggested that doctrine will tend "to solidify, like a slowly moving lava flow"[43] unless it is subject to constant and critical interrogation. Professor Michael Howard has written that:

> *'I am tempted indeed to declare dogmatically that whatever doctrine the Armed Forces are working on now, they have it wrong. I am also tempted to declare that it does not matter that they have got it wrong. What does matter is their capacity to get it right quickly when the moment arrives.'*[44]

As the leading edge of technology advances at such a rate that most armed forces in the world are struggling to keep pace with the last stage of obsolescence, keeping abreast of conceptual thinking and then converting this to doctrine is possibly one of the most important tasks facing a commander. Doctrine can be said to exist in three forms: the formal written word (AP3000), conceptual thinking and the emerging doctrine that results. We cannot expect to be able to apply doctrine to every military situation with the precision and utility of a Delia Smith recipe. But it should always be there as a guide to our actions. Equally importantly, live and vibrant doctrine is an excellent means by which to measure our success, or otherwise, after a conflict has occurred. Lessons may then be identified, hopefully learned and post-conflict action taken.

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If we adopt the attitude that we do not need doctrine because we are buying 232 Eurofighters, we run the risk of building the doctrinal desert that characterised formal thinking in the inter-war years. We must also beware the pitfalls implicit in basing our emerging doctrine on acquisition of technology or capabilities that are beyond our grasp. To do so would be tantamount to endorsing the concept of the bomber always getting through.

## OWNERSHIP OF PLATFORMS

A whole generation still considers denim to be the devil's cloth. If so, sterile debate over the ownership and operation of platforms constitutes the devil's dogma. Such a debate, at whatever level, can only increase the real and Clausewitzian friction between arms of a force. This could take place between services over the operation of certain key assets – such as tactical transport aircraft or attack helicopters. Equally, it could occur between component commanders on a deployed operation. It behoves all who feel tempted to engage in such fruitless debate to remember that assets are detached to the Joint Force Commander – and not to individual components. Bickering over ownership prevents any attempt to engage in real manoeuvre warfare and, at best, only allows individual elements to operate in isolation – synergy is impossible.

# AIR POWER WILL CURE ALL ILLS – EVEN WITHOUT A COHERENT STRATEGY

American involvement in Vietnam spawned an entire industry dedicated to analysing the conflict and its origins. Various 'doctrines' were spelled out in the hope that foreign adventurism would only be embarked upon when genuine national interests were at stake. General Colin Powell also put forward the concept that military force should not be committed unless there was a clear political aim which was translatable into a military strategy; the means had then to be allocated along with an achievable end-state and an exit strategy. Although this may remain a highly desirable 'doctrine' for medium scale warfighting situations, it is arguably too idealistic to apply to peacekeeping or peace enforcement operations. The reality is often that the political impetus is such that an immediate humanitarian reaction is essential; if this also alleviates media pressure, so much the better. The speed of reaction, flexibility and reach of air power is such that it will often be in the vanguard of any action that is contemplated. But this does not release us from the obligation to think ahead and plan for the sorts of eventualities that Powell envisaged.


*General Colin Powell put forward the concept that military force should not be committed unless there was a clear political aim which was translatable into a military strategy...*

These ten myths and challenges facing the use of air power in the modern world are by no means exhaustive. Nor do they seek to challenge or replace Tedder's principles or Meilinger's propositions. The prime intention is to stimulate debate in the hope that strategic thinking will coalesce into future doctrine, thereby preventing our existing work from descent into dogma. In short, it aspires to be part of Overy's 'constant and critical interrogation'.

NOTES

1 See for example the discussions on borders within Yugoslavia with regard to the areas of Serbian and Kosovar minorities in *The Economist*, 25 February 2000.

2 The inclusion of a far right party within the Austrian Coalition government sparked serious reactions around the world.

3 Professor Richard Overy, 'Doctrine not Dogma: Lessons from the Past', *Royal Air Force Air Power Review*, Spring 2000, Vol. 3, No 1, page 33.

4 See Chapter 3, AP1300, *Royal Air Force Manual – Operations*, published in March 1957 followed by Annex A to *Joint Warfare Publication 0-01, British Defence Doctrine*, HMSO, 1996.

5 A W Tedder, *Air Power in War*, Hodder and Stoughton, London, 1948.

6 Colonel Philip S Meilinger USAF, *10 Propositions Regarding Air Power*, Air Force History and Museums Program, 1995.

7 Dr Grant T Hammond, 'Myths of the Gulf War: Some 'lessons' not to learn', *Royal Air Force Air Power Review*, Summer 2000, Vol. 3 No 2, page 55.

8 Eric Ash, *Sir Frederick Sykes and the Air Revolution 1912 –1918*, Frank Cass, London, 1999, chapter 5. The losses were due in part to Trenchard's insistence on the use of air power as an offensive weapon – in concert with the views of Haig.

9 Sir Maurice Dean, *The Royal Air Force and Two World Wars*, Cassell, London, 1979, page 11.

10 Giulio Douhet, *The Command of the Air*, reprinted by the Office of Air Force History, Washington DC 1983, (original published in 1921).

11 Ibid, page 204.

12 AVM Tony Mason, *Air Power; A Centennial Appraisal*, Brasseys, London, page 45.

13 Stanley Baldwin, House of Commons, 10 November 1932.270 Parliamentary Debates (House of Commons), Official report 5th Series, c632. Baldwin went on to add: 'The only defence is offence, which means that you have to kill more women and children more quickly than the enemy,'.

14 Cited in Richard P Hallion, *Storm over Iraq: Air Power and the Gulf War*, Smithsonian, Washington, 1992, page 241.

15 For a balanced view see Professor Lawrence Freedman, 'The Future of Air Power', in Group Captain N E Taylor (ed.) *The Gulf War and some Lessons Learned*, transcript proceedings of an Air Power Conference' London 1992, page 87.

16 See Tim Ripley, *Operation Deliberate Force: The UN and NATO Campaign in Bosnia 1995*, CDISS, Lancaster, 1999.

17 Eliot A Cohen, 'The Mystique of US Air Power', *Foreign Affairs*, Vol. 73 No 1, page 109.

18 This rather derogatory term was used by the Foreign Secretary, Robin Cook, on the Radio 4 *Today* programme on the morning of 25 March – after the first night's bombing. For better or worse, the term stuck irrespective of the operational pedigree of those concerned.

19 John Keegan, 'So the bomber got through to Milosevic after all', *Daily Telegraph*, 4 June 1999, page 28. See also John Keegan, 'Yes, we won this war; let's be proud of it.' *Daily Telegraph*, 24 June 1999, page 26. Contrast this with General Sir Michael Rose, 'Peacekeepers fight a better war than bombers', *Sunday Times*, 20 June 1999, page 26.

20 Air Chief Marshal Sir Richard Johns, ' Sir Frederick Tymms Memorial Lecture', *Royal Air Force Air Power Review*, Spring 2000, Vol. 3 No 1, page 14.

21 Rebecca Grant, *The Kosovo Campaign: Aerospace Power made it work*, The Air Force Association, September 1999, page 28.

22 The recognition of this was implicit in the UK's Strategic Defence Review. *The Strategic Defence Review*, Cm3999, London, 1998, Chapter 3. (Henceforth cited as 'SDR')

23 James Cable, *Gunboat Diplomacy 1919–1991*, 3rd edition, Macmillan, London, pages 6-7.

24 Eliot A Cohen, ibid., page 109.

25 Sir John Slessor, *The Central Blue*, Cassell, London, page 67. See also David E Omissi, *Air Power and Colonial Control: The Royal Air Force 1919–1939*, Manchester University Press, Manchester, 1990.

26 Tami Davis Biddle, 'Bombing by the Square Yard: Sir Arthur Harris at War, 1942–1945', in *The International History Review*, XXI.3 September 1999, page 639.

27 For a useful description of the impact of precision weapons during Linebacker I see Robert F Futrell, *Ideas, Concepts, Doctrine: Basic Thinking in the United states Air Force 1961–1984 Volume II*, Air University Press, Maxwell AFB, 1989, page 269.

28 Anthony H Cordesman, *The Lessons and Non-Lessons of the Air and Missile War in Kosovo*, Centre for Strategic and International Studies, Washington, 1999, page 13.

29 Cordesman, ibid, page 13.

30 Stephen Farrell, 'UN Rights Chief warns allies on bombing', *The Times*, 5 May 1999. The rights chief in question was Mrs Mary Robinson the United Nations Commissioner for Human Rights.

31 Cordesman, ibid, page 39.

32 As suggested the literature in this area is extensive. For the journalist's viewpoint see John Simpson, *Strange Places, Questionable People*, Macmillan, London, 1998, page 8 or John Pilger, *Distant Voices*, Vintage Books, London, 1992. See also Mike Bratby, 'Air Power and the Role of the Media' in Andrew Lambert and Arthur C Williamson, *The Dynamics of Air Power*, RAF Staff College Bracknell, 1996, page 86.

33 For a useful summary of the relations between the press and the military see Philip Knightley, 'Casualty of War', *Daily Mail*, 17 April 1999, page 12.

34 Max Hastings and Simon Jenkins, *The Battle for the Falklands*, Pan Books, London, 1997, page 376 is an excellent example of this.

35 Paul Preston, 'Newspapers take a direct hit as readers grow weary of war'. *Observer Business*, 23 May 1999, page 7.

36 Published as: The Rt. Hon George Robertson MP, 'War in Kosovo: Some Preliminary Lessons' *Journal RUSI*, August 1999, Vol. 144, No4, page 1, based on the speech given on 2 June 1999. Mr. Campbell's lecture was published in the same issue on pages 31–37.

37 Author's headcount!

38 General John Jumper, 'Kosovo Victory – a Commander's Perspective, *Royal Air Force Air Power Review*, Winter 1999, Vol. 2 No 4, page 2.

39 Terminology taken from *AP 3000, British Air Power Doctrine*, Third Edition, HMSO, London, 1999, Chapter 8.

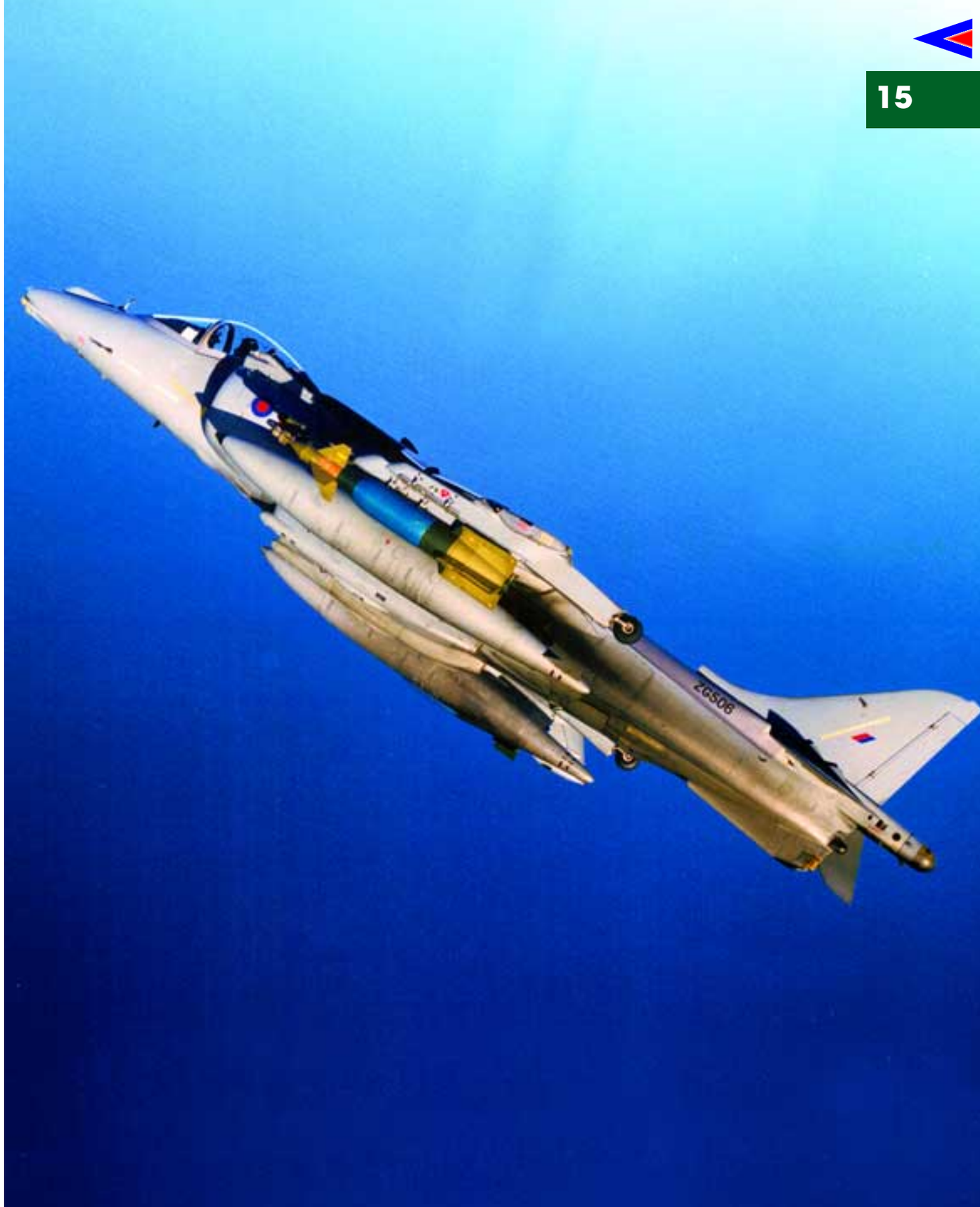
40 See Williamson Murray, 'Drifting into the Next Century; the USAF and Air Power', *Strategic Review*, Summer 1999, page 22. This article gives a useful insight into the problems facing future air power. See also Williamson Murray, *Hard Choices: Fighter Procurement in the Next Century*, CATO Institute Paper, Washington DC, 1999.

41 Cordesman, ibid, page 101.

42 The decision making cycle described by John Boyd in which the commander Observes the enemy, Orientates his forces, Decides and then Acts. Modified by a wag after Kosovo to Observe, Overreact, Deny and then Apologise.

43 Richard Overy, Doctrine Not Dogma: Lessons from the Past, *RAF Air Power Journal*, Vol. 3, No 1, page 32.

44 Michael Howard, 'Military Science in an Age of Peace', Chesney Memorial Gold Medal Lecture given on 3 Oct 73 and published in JRUSI, Vol. 119, No1, page 7.




**This Harrier GR7 is equipped with a Laser-Guided Bomb (LGB) synonymous for precision strikes with minimum collateral damage**