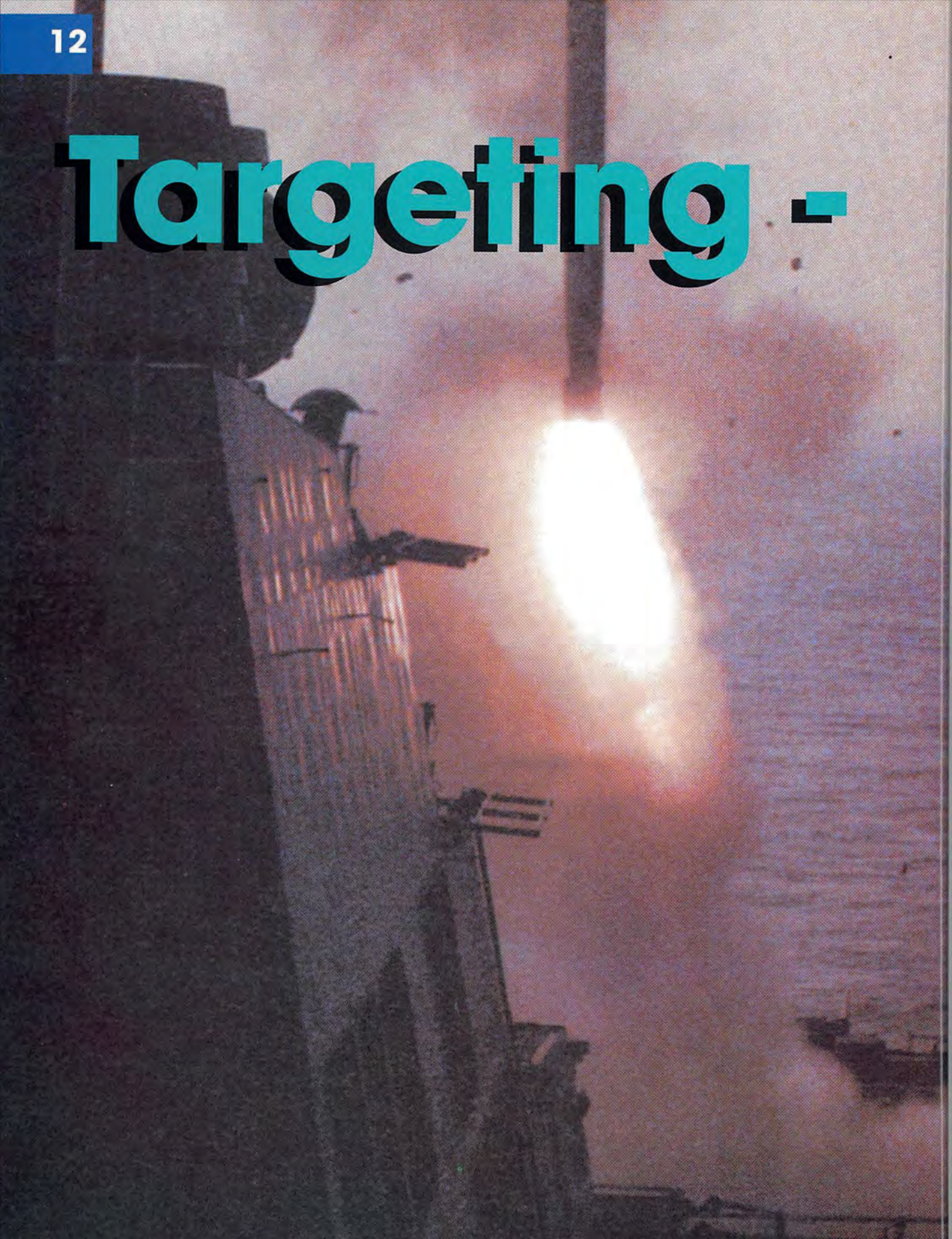
Targeting -



Air Power's Options

By Sqn Ldr Andy Walters, 617 Sqn RAF Lossiemouth

Air power, by virtue of its characteristics of height and reach, has the ability to bypass the surface campaigns of the navy and army and direct its influence against almost any target. However, being able to strike at almost anything does not mean that it is necessary to strike at everything. Indeed, the principle of economy of effort would advocate strongly against this strategy. Most air theorists have proposed that the essence of air strategy is to identify the enemy's weaknesses, termed centres of gravity, and then to concentrate overwhelming firepower on them; the Chinese General Sun Tzu wrote in 490 BC that the highest generalship was: *'to compel the enemy to disperse his army, and then concentrate superior force against each fraction in turn'*.[1] However, there has been great disagreement over what are the most rewarding targets...

LEGALITY VS LEGITIMACY

The majority of states attempt to comply with international law when conducting hostilities. International law has far reaching implications, as it covers situations from the grand-strategic (is military action legal?) to the tactical (what do the rules of engagement define as a legal target, and how should civilians and prisoners of war be treated?). Indeed, lawyers are becoming increasingly familiar faces around air headquarters. International law exists on 2 levels: customary and treaty law. Customary law is derived from the actual practice and actions of states over a period of time, but lacks supreme authority; unlike domestic law, customary law has no law making (legislative), law determination (courts), or law enforcement (police) bodies. Customary law is, in effect, the accepted norm of inter-state relations, and varies from region to region. Customary principles that affect

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military action include those of military necessity, proportionality, cultural protection, and military/civilian distinction. Attempts to codify customary law have resulted in treaty law. Treaty law applies only to those states whose governments are signatories to the treaty and whose legislative bodies have also ratified them. For example, while the Geneva Conventions of 1949 have been almost universally ratified (186 states by 1996), the number of states party to the Conventions' 1977 Additional Protocol II is only 135. Protocol II prohibits, amongst other things, attacks that may release nuclear, biological, and chemical (NBC) toxins; while the UK and most European allies are signatories, abstainers include the USA. States who suffer an illegal act by another state which refuses to make reparations have 2 options open to them: they may impose sanctions (termed 'retorsion'); or they may carry out reprisals (acts which would normally be illegal). Almost all states, with the notable exception of Switzerland, are signatories to the United Nations Charter. The UN Security Council (UNSC) is responsible for the maintenance of international peace and security,[2] and member states agree to accept and carry out its decisions.[3] However, the right of veto held by the 'Permanent Five' members of the UNSC (China, France, Russia, UK, and the USA) has often limited the effectiveness of the UNSC. Even within treaties, different states interpret international law differently; some nations insist on a UNSC resolution to confer legality on military action, whilst others do not.

Military legitimacy is the perception within a nation or coalition of the moral authority to engage in military action, and can be a crucial factor in maintaining both internal and international support. In democratic states, the degree of public support is often an indicator of legitimacy, and military commanders must ensure that they act within their national moral and cultural standards. The perception of legitimacy varies regionally according to each country's national, historic, and cultural values and laws. As such, the public's perception of legitimacy can be manipulated by government propaganda. For example, during the preamble to the Kosovo crisis, President Milosevic made a

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television broadcast from the site of the Serbian war memorial to the 1389 Great Battle of Kosovo Polje that, no doubt, reminded Serbs of their historical links with Kosovo. International law is rarely black and white, and different interpretations can bestow an element of legitimacy on almost any military action. The legality of the August 1998 US cruise missile strikes on Sudan and Afghanistan in response to the terrorist bombing of the US Embassies in Kenya and Tanzania (which killed 291 and wounded 5,000[4]) may be debatable, but there is little doubt that it was perceived as being legitimate by most American citizens. Thus, *legitimacy* is distinct from *legality*. Additionally, the absence of a UNSC resolution resulting from one of the 'Permanent Five' using its right of veto may not stop a coalition from military action if public opinion regards a particular course of action as legitimate and necessary. Indeed, the recent crescendo of genocide and ethnic cleansing around the world has fuelled the growing Western perception that international law is subservient to higher moral principles.

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TARGETING THE WILL TO FIGHT

It has long been the aim of military theorists to target the enemy's will to fight. If your opponent can be convinced that he has no option but to comply with your demands, costly battles of attrition can be avoided. There are 3 main audiences who can be targeted in this manner, namely the leadership group, the civilian population, and the fielded military forces.

Western political constraints can preclude deliberate attacks against enemy heads of state. However, USAF Colonel John Warden proposed in 1986 that the key centre of gravity was the enemy leadership. His model was likened to a target bull's-eye, with 5 concentric rings.[5] The innermost ring, and the highest value target, was the enemy leadership, surrounded in order of decreasing strategic significance by raw materials and power, industry and transportation, population, and finally fielded forces. Warden proposed that air power should target the cause of conflict, the enemy leadership. This theory was put into practice during the Gulf War, although despite the damage caused to Saddam's power base, it is debatable whether Saddam's will to fight was broken. Indeed, it is likely that totalitarian heads of state will try to remain in power at almost any cost and will not be swayed easily from their objectives. To be effective against these leadership groups, coercive action may have to be so extreme as to be morally unacceptable, such as the attacks on Hiroshima and Nagasaki. Totalitarian leaders are often supported by supposedly democratic parliaments, but attacks against these bodies may, again, be unacceptable to Western public opinion. However, by isolating the leadership from the fielded military forces by degrading their command, control, and communication (C^3) capability (the enemy's 'nervous system'), they may become incapable of reacting quickly to offensive action, giving friendly forces the initiative and allowing them to apply overwhelming pressure at a time and place the enemy least expects.[6] For example, during the Gulf War, Iraqi C^3 was reduced to chaos by Coalition targeting, with commanders' situational awareness often limited to their line of sight.[7] An additional benefit of isolating your opponent's front-line units from their C^3 is that they may no longer be exposed to their leadership's propaganda and thereby become more susceptible to friendly psychological warfare. However, if an operation's aim is to coerce a government into changing its policies, a fine balance must be met between disrupting the enemy's C^3 and allowing him to recognize and assess the amount of damage his infrastructure has suffered. Attacks against government infrastructures such as political party headquarters may demonstrate that a coalition's quarrel is against the government and not the population, but the message may not reach a sufficiently large audience if the media is tightly controlled or has already been rendered ineffective by hostile action. In states containing oppressed factions, this message may be conveyed more effectively by the overt targeting of the instruments of local oppression, such as district police stations or militia barracks.

In May 1917 a German force of less than 40 Gotha aircraft made a series of attacks on London. The raids caused widespread panic and absenteeism, and significantly disrupted war production. Based on this and other limited experience from France and Italy, Giulio Douhet proposed in 1921 that if an enemy's cities were subjected to concentrated air attack by a mixture of incendiary, chemical, and high explosive bombs, the civil population would quickly demand their government to bring an end to the war.[8] However, during World War II neither the British population during the Blitz, nor the German public during the Allied Strategic Bombing Offensive, applied sufficient governmental pressure to bring an end to hostilities. Indeed, it is dubious whether an air campaign against the civil population of a totalitarian regime could ever produce decisive results. Strategic nuclear weapons aimed at civilian population centres were used as the instrument of deterrence during the Cold War. However, many states now accept that civilians should not be made the target of physical attack.[9] Nonetheless, this is unlikely to exclude the targeting of civilian populations in the future, as demonstrated by the Iraqi Scud attacks on Tel Aviv during the Gulf War. The targeting of the media has recently made the headlines in Kosovo, where propaganda made an effective contribution to the Serbian war effort. Whilst television and radio studios make tempting targets, their physical destruction may raise eyebrows at home, not least because of the non-military casualties or because Western journalists may feel a degree of sympathy for their foreign

...during World War II neither the British population during the Blitz, nor the German public during the Allied Strategic Bombing Offensive, applied sufficient governmental pressure to bring an end to hostilities

colleagues; the action may unify the enemy population. A more effective and subtle approach may be the use of 'morphing' technology, whereby the words and pictures of even live television interviews can be altered to change the meaning of the message.[10] The civil population of a country controlled by even an unpopular government may be united against a foreign coalition by feelings of nationalism if facilities considered to be part of the national infrastructure, and not directly linked to the political leadership, are attacked. Examples may include public amenities such as electrical power, television or radio stations, and famous landmarks such as bridges. Indeed, there are many examples of unpopular governments deliberately engaging in military campaigns to unite the country's population and divert public attention from domestic issues. Finally, it should not be forgotten that the targeting of civilians and their utilities may have long-term ramifications. As stated by Sun Tzu, *'One should seek victory... at the least cost in casualties to one's enemy, remembering that one has to live next door to him when the fighting is over.'*[11] The current unrest in the Balkans demonstrates that historic grievances do not easily fade away.

The morale of the military has often been targeted. The United States expended considerable effort during the Gulf War in radio and loudspeaker broadcasts and leaflet drops on the Iraqi troops occupying Kuwait. These psychological operations (Psyops), when combined with regular air raids by B52s, resulted in 87,000 Iraqi POWs, most of whom surrendered without a fight.[12] The success of Psyops in this particular case may have been due to several factors. Firstly, morale is never likely to be high in conscript armies, especially those whose leadership displays a lack of concern over the welfare of its troops. Secondly, the disruption of communications and re-supply links to the forces entrenched in Kuwait led to poor living conditions and a sense of isolation, leaving them vulnerable to Allied propaganda. Lastly, regular and apparently omnipotent aerial bombardment convinced many Iraqis troops that the only way to avoid martyrdom was surrender or retreat.

One of the latest theories to be advanced by the USA on the targeting of the will to fight is *Rapid Dominance*.[13] This novel operational concept is based on the ability to impose shock and awe to affect the will and perception of the enemy. It is based on 4 fundamental characteristics: total knowledge of the enemy; rapidity of action and reaction; brilliance of execution; and control of the environment. Rapid Dominance proposes the development of new technologies, including global artillery that can target anywhere in the world from the Continental US with non-lethal as well as lethal warheads, as well as intrusive information warfare such as the morphing of enemy propaganda already mentioned. However, first use of these novel technologies may well be hampered by a reluctance to use them for fear of revealing their existence.

The history of targeting the will to fight has not been universally successful in either total war or coercive action, and one alternative is to target the *ability* to fight...

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TARGETING INDUSTRY...

During the years between the First and Second World Wars, American doctrine identified the enemy's industrial infrastructure as a key centre of gravity. It was proposed that targeting key factories that produced items on which the military were dependent could neutralize an adversary's military capability. This 'industrial web' theory was also adopted by the British, although they expanded the doctrine to include other more general industrial targets such as electrical power and oil production facilities which it was felt would cause such disruption that the populace would demand peace. However, the accuracy of aerial bombing was not sufficient during World War II for the 'industrial web' strategy to be achieved easily and factories have often proved to be able to operate despite considerable damage. Additionally, in anything other than total war, industry's vital role in post-conflict national reconstruction may preclude it as a target unless the rewards gleaned from its disruption are particularly high.

...AND TRANSPORTATION

In 1936, Wing Commander John Slessor proposed that air interdiction of the enemy's transportation system at both the strategic and operational levels would cut the adversary army's re-supply routes, making it susceptible to offensive action, whilst simultaneously paralysing the whole country, and thereby affect the national will.[14] Certainly, the targeting of the German rail network during the Allied Strategic Bombing Offensive of World War II had a profound effect on the entire German war effort. Similarly, German reserve forces were unable to reinforce the Normandy defences after D-Day due to the disruption caused to the transportation system by air power. Unlike industry, most transportation systems can be repaired relatively easily post conflict.

ATTRITION, ASYMMETRY, PARALLEL OPS, AND APPORTIONMENT

History is full of examples of armies and navies that pounded each other until one side was defeated and could not prevent the occupation of its territory by the other. Champions of strategic bombing have long claimed that air power can avoid such wasteful wars of attrition by overflying armies and navies and directly attacking the enemy centres of gravity that these forces were deployed to protect. However, this is not to say that air power should not be used to prepare the battlefield for later assault by surface forces. Indeed, the concentrated use of close air support aircraft in 'asymmetric ops' against German mechanized armour following the D-Day invasion played a crucial role in supporting the Allied armies and the subsequent liberation of Europe. The Battle of Khafji during the Gulf War had been planned as a major Iraqi offensive by 2 full divisions, but ended up being characterized as a minor border skirmish after the main Iraqi force was decimated by Coalition air power when it was caught in the open moving south towards the Saudi border; the Iraqis suffered 2,000 casualties and lost 300 vehicles before the offensive was abandoned.[15] However, the economics of using expensive precision-guided munitions to destroy a belligerent's numerous low-tech assets may be prohibitive. Furthermore, attrition warfare can be expensive, not only in terms of the cost of deploying sufficient forces to achieve the level of attrition necessary to defeat the enemy, but also in the number of friendly and enemy casualties. Nonetheless, when faced with an opponent whose aim is to occupy your home territory, the defender may have to rely on attrition warfare simply to avoid his bases being occupied; there is little point of returning from a strategic air attack against the enemy's leadership to find your opponent lunching in your mess! The high cost of both manpower and modern technology, combined with the West's abhorrence of casualties, has fuelled the search for more subtle targeting strategies, resulting in the move towards manoeuvre warfare. However, Western forces confronted by a technologically inferior, but possibly numerically superior, conscripted foe may find themselves the subject of attrition tactics, especially if the protagonist does not share the

...there is little point of returning from a strategic air attack against the enemy's leadership to find your opponent lunching in your mess!

West's sensitivity to casualties. Iraq attempted just such a strategy during the Gulf War, seeking to inflict high casualties on the Coalition that would be unacceptable to Western public opinion. The beauty of air power is that different strategies can be carried out simultaneously, a theory known as *parallel ops*. Indeed, the simultaneous attack of different target sets may well overwhelm the enemy's ability to react to offensive action. Thus, during Desert Storm F117s carried out attacks against leadership targets in Baghdad while A10s destroyed Iraqi armour in Kuwait. Furthermore, the flexibility of air power allows the same airframes to be switched from one role to another; although F111s started Desert Storm by attacking fixed, hardened targets such as bunkers, they ended the Gulf War as the highest scoring tank killer. One of the skills of targeting is the correct and timely apportionment of the available assets to the competing demands of the different targeting strategies.

FACTORS AFFECTING TARGETING STRATEGIES

The targeting strategy of any offensive air campaign is dependent on the accuracy of aerial bombardment. During World War II, American bombing precision was insufficient to destroy the key factories that were the targets of the 'industrial web'. Meanwhile, the RAF's night bomber fleet attacked industrial targets located in cities, hoping that damage would be done to enemy morale, even if the primary target was not destroyed. Target defences may also affect the accuracy of aerial bombardment; when the RAF's Tornado GR1 fleet changed to medium level operations to avoid Iraqi AAA during the Gulf War, the resulting degradation in bombing accuracy forced a change of targeting policy away from small targets such as command bunkers, to larger targets such as oil refineries. Thus, target defences may make some key targets relatively inaccessible.

Modern PGMs can bring an enormous concentration of force to bear against a centre of gravity. Military targets located in civilian areas can now be attacked with a reduced level of collateral damage compared to dumb bombs. Furthermore, their precision reduces the weight of explosives required to achieve the required damage. Indeed, it is possible to use weapons without any explosive content in situations that are particularly sensitive to collateral damage. Interestingly, over twice as many LGBs were dropped during the Vietnam War than during the Gulf War,[16] mostly against choke points such as bridges. Yet LGBs had little overall effect on the outcome in Vietnam, and most people associate the Gulf War as the watershed for PGMs. So how do we explain this hiatus? One obvious reason is the increased accuracy of modern LGBs, but there are other important factors. Unlike Vietnam, LGBs were often used against operational and strategic-level targets during the Gulf War, where they were more effective at influencing the final outcome of the conflict. Closer to home, NATO-assigned air forces were tasked with the defence of Europe, where low cloudbases and poor visibility often limit the opportunities to employ LGBs. Indeed, the sensitivity of LGBs to environmental conditions was recently underlined during the Kosovo Crisis.

...it is possible to use weapons without any explosive content in situations that are particularly sensitive to collateral damage

There are also considerations for non-man-in-the-loop PGMs that may limit their utility. For example, can your autonomous battlefield anti-tank PGM differentiate between an opponent's T55 and a coalition Abrams? So PGMs are not a panacea; LGBs are degraded by poor weather, and even GPS-guided bombs are reliant on precise, accurate target

coordinates and can be jammed. Furthermore, PGMs can malfunction and impact considerable distances from their aiming point; if collateral damage must be avoided at all costs, it may be necessary to use less accurate, but more predictable, dumb bombs. In this case, more sorties will almost certainly be required to achieve the desired level of damage.

Political and legal constraints may make certain centres of gravity inaccessible. For much of the Vietnam War American forces were prohibited from bombing the North Vietnamese capital city, leaving the enemy leadership and industrial base untargeted. Thus, it may not always be possible to attack the key centres of gravity that lie in the centre of Warden's model. In totalitarian regimes, the head of state is an obvious centre of gravity. Whilst this form of targeting may be currently unacceptable to Western nations because of the overtones of assassination, there may come a time when the public is prepared to sanction such action in preference to the unnecessary deaths of thousands of relatively blameless conscripted serviceman. Public willingness to proceed in this direction might be further enhanced if the enemy has not been willing to accept a 'home match' and Western countries have become the target of 'asymmetric' terrorist attacks, especially if chemical or biological agents have been used, or if great numbers of friendly casualties are anticipated. Thus, Warden's theory of targeting the leadership may become increasingly relevant in the future.

Hardened targets have always been a challenge to air power. As weapon precision has increased, there has been a corresponding increase in the protection afforded to high value assets. Even a direct hit by a PGM may not be sufficient to destroy very hard targets. One example is the Tarhunah facility, 40 miles south east of Tripoli. Part of this 'Great Man-made River Project', which was built to provide Libyan cities with water, consists of 2 mountain tunnels buried under 100 feet of sandstone and reinforced concrete. These tunnels, assessed as being a chemical weapons facility by the CIA (and also described as being for Libya's protection by Colonel Ghadaffi), are impregnable to current conventional weapons, despite considerable ongoing research into enhanced penetration munitions and void-sensing fuzes.[17] Thus the enemy's centres of gravity, even if located, may not be susceptible to attack.

BATTLESPACE KNOWLEDGE

The destruction of an adversary's centres of gravity is dependent on a four-stage process, namely: selection; location; attack; and assessment. A new term is on the streets to describe the process of gaining sufficient knowledge to ensure effective targeting: RISTA (Reconnaissance, Intelligence, Surveillance, and Target Acquisition).

Selection of the correct centres of gravity depends on a fundamental understanding of not only the enemy's military, industrial, and political structure, but also his cultural and social background. The situation is complicated further if there is uncertainty over the true motivation behind the enemy. For example, are the fundamental Islamic states motivated purely by religion, or are wealth and power more important? It is necessary to adopt the viewpoint of the enemy and try to understand his decision-making process, taking into account the cultural and social differences that distinguish yourself from your adversary. What does he consider to be his centres of gravity? The way his defences are deployed may indicate what he values, as demonstrated by the concentration of air defences around Baghdad during the Gulf War. Whilst democratic countries are susceptible to public and media pressure, totalitarian states may be unaffected. It is important not to target

facilities just because they are accessible; all targets should contribute towards the final objective. What is expected to be achieved by bombing, for example, an adversary's oil production facilities if the final objective of the campaign is achievable in a short time-frame? How is he expected to react to the bombing campaign, and what effect will bombing a particular target have on coercing the decision-makers into a particular course of action? It is also necessary to understand the enemy's cost-benefit analysis; what may be considered to be a peace support operation to one party may be perceived as a fight for national survival by the other; if the enemy does not share the Western value of human life, he may be prepared to take drastic action, or be willing to accept high civilian casualties. It is crucial that the air planner realises the significance of these apparently intangible factors. A detailed knowledge of the enemy's infrastructure can bring significant economies of effort. For example, if the centre of gravity has been identified as the enemy's power grid, it may be possible to bomb a small number of distribution nodes, rather than every power station. Conversely, if the aim is the long-term degradation of a opponent's capability, or if accurate intelligence is not available, it may be necessary to attrite all the elements of a target set to assure the required damage level, thereby increasing the number of missions required, lengthening the duration of the campaign, and increasing casualties on both sides. The combination of good intelligence and PGMs offer the possibility of selecting the damage level required. For example, if the target is a gas turbine power station and the objective is to shut down power production for a short time, the transformers or power lines, which are relatively easy to replace, could be targeted. Indeed non-lethal weapons, such as graphite filament and charged carbon particle bomblets, can disrupt electrical power grids without causing permanent damage[18]. Conversely, if the objective is long term, the turbines themselves could be targeted, which may take years to be re-manufactured, especially if economic sanctions are imposed. What is important is that the targets chosen and the degree of functional disruption (as opposed to physical destruction) must be clearly linked with the aim and time-scale of the operation.

Allied attack on Iraqi Scud launcher during the Gulf War

A target cannot be attacked unless its position is known. UN Special Commission inspectors discovered many previously unknown, and therefore undamaged, Iraqi nuclear, biological, and chemical installations after the Gulf War. Mobile targets such as ships, tanks, and transportable missile launchers are inherently difficult to locate. As a result of the accuracy of current PGMs, there has been a move away from the hardening of targets towards the dispersal and camouflaging of vital equipment, and the use of 'shoot and scoot' tactics. These simple, low-tech tactics can offset an opponent's technical advantage. For example, at times up to 10% of Allied aircraft during the Gulf War were involved in the largely unsuccessful hunt for mobile Iraqi Scud missile launchers. Similarly, Serbian armour proved an elusive target during the Kosovo Crisis despite NATO air superiority due to its dispersal amongst civilian infrastructure and the use of camouflage.

Intelligence must be up-to-date, or the target may have moved by the time that offensive aircraft can attack. Furthermore, it is not enough just to have RISTA platforms such as JSTARS or ASTOR that pass real-time information to the Air Commander; the link should be extended to the platforms that will physically attack the targets. Thus, secure 'sensor-shooter' data links are required to allow the Air Commander to pass timely targeting data to airborne aircraft. Modern weapon systems without man-in-the-loop technology, such as cruise missiles and GPS or inertially-guided munitions, have complicated the issue as they require accurate target coordinates to maximize their potential. If these weapons cannot be reprogrammed once airborne, then the ability to react against mobile, fleeting targets will be limited to the mission planning and flight time of the weapon and delivery system. Targets may also be difficult to locate due to topography; target acquisition was often hampered during the Vietnam War by jungle cover, whereas most targets in the Gulf War were relatively accessible. During terrorist, limited, or unconventional warfare, the potency of air power may be reduced by the inability to distinguish between innocent civilians, refugees and the enemy, as recently demonstrated in Kosovo.

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Even when a site has been located, there may be doubt as to its true function. The accidental targeting of the Chinese Embassy in Belgrade during the Kosovo Crisis due to out-of-date intelligence is one good example of a tactical mistake with strategic consequences. The facilities for producing chemical and biological weapons are often 'dual use', capable of producing legitimate civilian products such as fertilizers or pharmaceuticals and often sharing the same production machinery. If intelligence sources revealing a 'dual use' facility's true purpose are so sensitive that they cannot be released to the public following a strike, the enemy may be presented with an obvious publicity coup. NBC sites present other problems, as their destruction may release toxins; attacks on the 2 reactors at Al Tuwaitha during the Gulf War were carefully planned to avoid the release of radiation, but a similar attack against a chemical weapon facility at Muthanna resulted in the scattering of biological weapon production machinery.[19] One area of future weapons development is the procurement of high-temperature incendiary warheads that will neutralize biological and chemical agents.

After a centre of gravity has been attacked, battle damage assessment (BDA) and weapon effect analysis should quickly be carried out to assess whether the required level of damage has been achieved so that reattack recommendations can be made.[20] In this way, the need for further possibly nugatory strikes can be avoided. It can be difficult to assess the success of an autonomous 'launch and leave' PGM attack because, unlike most man-in-the-loop weapons, there may be no record of where the weapon has actually impacted. This can pose problems, as it may be difficult to disprove an opponent's allegation that the missile has missed its target and caused collateral damage. BDA was one area where the Allied Coalition was found to be lacking during the Gulf War.

FRIENDLY CENTRES OF GRAVITY

The air strategist should also be aware of his potential weaknesses. Even when overwhelming force is set against him, an astute adversary may be able to identify and target friendly centres of gravity. Friendly centres of gravity include the level of unity and commitment within a coalition, and the Western distaste for casualties (both our own and those enemy casualties resulting from collateral damage).[21] In democratic countries, public opinion is an easily targeted centre of gravity; the influence of the Western media – the *CNN factor* – in transmitting images of death and destruction resulting from coalition attacks should never be underestimated. A cunning foe may well use his control of the Western media within his territory as a conduit to target the resolve of western governments. In Somalia, the effect on American public opinion of 30 casualties, some of whose bodies were shown being dragged through the streets of Mogadishu, was sufficient to force the US to withdraw. Iraq seemed aware of these factors during the Gulf War and tested the resolve of the Allied Coalition in several ways:

A cunning foe may well use his control of the Western media within his territory as a conduit to target the resolve of western governments

- Iraq targeted missiles on Tel Aviv in an attempt to draw Israel into the war. This could have resulted in the Arab elements of the Allied Alliance withdrawing their support. As a result of these attacks, a significant proportion of Allied air power was tied up searching for Scud launchers, which delayed the overall air offensive.
- By allowing civilians into military installations where they became vulnerable to Allied attack, Iraq used the media as a weapon to target the West's aversion to civilian casualties. The publicity resulting from the bombing of the Al Firdos bunker in the Ameriyya suburb of Baghdad during the Gulf War complicated the Allied targeting campaign; as a result of the civilian casualties from this attack, targets in civilian areas of Baghdad became the exception that had to be approved by Washington, rather than the rule.[22] Similarly, Iraq moved several high value assets into civilian suburbs, archaeological sites, and mosques, to reap the publicity benefits of collateral casualties or make them immune from Allied air attack. Additionally, Allied POWs were shown on television to lower the morale of the Allied public and military.

CONCLUSION

Doctrine has often offered more than can be achieved by technology, and targeting remains one of the greatest problem that offensive air power faces. The selection of an adversary's centres of gravity is of vital importance to air strategy. These centres of gravity are context-specific; they are dependent on the aim of the operation, the enemy's culture, social structure, political system, industrial infrastructure and military capability. Furthermore, selection of an inappropriate target may adversely affect public support for the campaign. There is no panacea target, or indeed targeting policy; the art of targeting is to apply the most appropriate stratagem to the situation. An air

commander must therefore possess not only an intimate knowledge of his adversary, but must also be aware of his own centres of gravity. Air power's ability to affect targets has often exceeded its ability to identify which of them are the critical centres of gravity. The need for up-to-date intelligence is therefore of vital importance to air strategy; indeed, they are fundamentally intertwined, and have always been so. This concept is not new, but has often been overlooked. As Sun Tzu wrote almost 2500 years ago, *'It is only the enlightened ruler and the wise general who will use the highest intelligence of the army, and thereby achieve great results'.*[23]

NOTES

1. Sun Tzu, *The Art of War*, edited by J Clavell, Hodder & Stoughton, 1981.
2. Article 24(1) of the UN Charter.
3. Article 25 of the UN Charter.
4. T Robinson, *The New Breed – The 21st Century Terrorist*, in the Royal United Service Institute for Defence Studies Newsletter, July 1999.
5. J Warden, *The Enemy as a System* in RAF Air Power Supplement to Air Clues 1997, and P S Meilinger's *Air Targeting Strategies: An Overview*, in Air Power Confronts an Unstable World, edited by R P Hallion.
6. This is in accordance with J Boyd's OODA-loop theory. See D Evans, *War: A Matter of Principles*, Macmillian Press, 1997, page 145, and P S Meilinger's *Air Targeting Strategies: An Overview*, in Air Power Confronts an Unstable World, edited by R P Hallion, page 60-62.
7. See M R Gordon and B E Trainor, *The Generals' War*, Back Bay Books, 1995, page 287.
8. G Douhet, *Command of the Air*, 1921.
9. Article 51(2) of the 1977 Additional Protocol I to the 1949 Geneva Convention.
10. See Ullman and J P Wade, *Rapid Dominance – A Force for All Seasons*, Royal United Service Institute for Defence Studies Whitehall Paper 43, 1998.
11. Sun Tzu, *The Art of War*, edited by J Clavell, Hodder & Stoughton, 1981.
12. A P N Lambert, *Shattering Impact: The Psychology of Air Attack*, in Air Power Confronts an Unstable World, edited by R P Hallion.
13. H K Ullman and J P Wade, *Rapid Dominance – A Force for All Seasons*, Royal United Service Institute for Defence Studies Whitehall Paper 43, 1998.
14. J C Slessor, *Air Power and Armies*, Oxford University Press, 1936. USAF Colonel (Professor) P S Meilinger proposes that Slessor was also an advocate of the strategic air campaign, but wrote his paper on air interdiction because he was a lecturer at the Army Staff College at Camberley (see *Air Targeting Strategies: An Overview*, in Air Power Confronts an Unstable World, edited by R P Hallion).
15. M R Gordon and B E Trainor, *The Generals' War*, Back Bay Books, 1995, chapter 13.
16. B D Watts, *Doctrine, Technology and Air Warfare*, in Air Power Confronts an Unstable World, edited by R P Hallion.
17. See Jane's Intelligence Review, 1 November 1996.
18. See M R Gordon and B E Trainor, *The Generals' War*, Back Bay Books, 1995, and *Jane's Defence Weekly*, 12 May 1999.
19. Jane's Intelligence Review, 1 November 1996.
20. See Wing Commander R M Poole, *Combat Assessment – Completing the Cycle*, in the Royal Air Force Air Power Review, Spring 1999.
21. See Tony Mason, *The Intelligence, Surveillance, Reconnaissance and Target Acquisition Requirement – An Overview*, in the Royal United Service Institute for Defence Studies Journal, December 1998.
22. M R Gordon and B E Trainor, *The Generals' War*, Back Bay Books, 1995.
23. Sun Tzu, *The Art of War*, edited by J Clavell, Hodder & Stoughton, 1981.