

THE ROYAL AIR FORCE

AIR POWER

Review

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Contents

CONTRIBUTIONS

FORE WORD

- | | | | |
|-----------|--|------------|--|
| 1 | Air Power and Levels of Warfare
Group Captain Peter W Gray RAF | 66 | The Impact of ISTAR on Military Deception
Wing Commander W J Millington RAF |
| 18 | Air Force Transformation Past, Present, and Future
Major General D A Deptula USAF | 94 | Dresden
Mr Eric Thale |
| 30 | A Practical Prophet? Arthur Harris, the Legacy of Lord Trenchard, and the Question of 'Panacea' targeting
Dr Walter Kudrycz | 150 | The Supremacy of Air Power
Col J F C Fuller |
| 44 | The Big Question – Will the Missile Defence System enhance US National Security?
Lieutenant Commander D I Burns
Royal Navy | 157 | Book Reviews |
| | | 161 | Notices |

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The Royal Air Force Air Power Review is published under the auspices of the Director of Defence Studies (RAF) and has the sponsorship of the Assistant Chief of the Air Staff. It is intended to provide an open forum for study which stimulates discussion and thought on air power in its broadest context. This publication is also intended to support the British armed forces in general and the Royal Air Force in particular with respect to the development and application of air power.

Contributions from both service and civilian authors are sought which will contribute to existing knowledge and understanding of the subject. Any topic relevant to the study of contemporary or historical air power will be considered by the Air Power Review Management Board and a payment of £200 will be made for each article published.

Articles should be original and preferably not previously published, although those of sufficient merit will not be precluded. Between 2,000 and 10,000 words in length, articles should list bibliographical references as end notes. Lengthy articles may be published in instalments. Contributions from serving military personnel should be in accordance with DCI GEN 313 dated 26 November 1999.

Submissions can be sent in a variety of electronic IBM or Apple Mac based formats, on floppy disc, Zip or CD, but these must always be accompanied by numbered page copy. No responsibility can be accepted for loss or damage to photographs or other related material sent with articles.

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FOREWORD

The nature of warfare has been the subject of academic and military discussion for as long as mankind has been at odds with his fellows. And if Sir Michael Howard's thesis is correct, it is actually peace that is the modern invention – not warfare or terrorism. Warfare has evolved from the groups of folk marauding and pillaging, through the era of mercenaries to the age of total war and beyond. Organised conflict is no longer (if it ever was) the exclusive preserve of nation states. In the first article, I have attempted to set the debate on levels and types of warfare in some form of rational framework with particular emphasis on the role of air power. It is imperative that the perennial debate on levels of warfare should clarify matters, not merely cloud the issue in rhetoric.

It is evident from any discussion on levels of warfare that, at all but the lowest level of conflict, we will be members of a coalition. This will almost certainly be in concert with the United States and it is therefore vital that we stay in tune with their thinking. The second article provides an invaluable opportunity so to do. Major General Deptula is no stranger to students of air power following his pivotal role in the planning of air operations during the Gulf War. More recently he has been instrumental in representing USAF views in the Quadrennial Defence Review negotiations. His article is therefore required reading for those who need to be abreast of current USAF thinking. In particular, it is worth noting that US terminology now eschews the 'Revolution', preferring a 'transformation'.

The third article has been submitted by Dr Walter Kudrycz who is currently completing post-graduate work on air power at University College in Australia. While much has been written on Harris and the question of 'panacea' targeting, this aspect of MRAF Lord Trenchard's legacy is often neglected. It is all too easy to accept the conventional view that the inter-war Royal Air Force did little more than talk about strategic bombing to the exclusion of all else. The reality was that not an inconsiderable amount of intellectual energy had to be expended on the very survival of the fledgling Service. This article adds considerably to the debate.

The following article is by Lieutenant Commander DI Burns Royal Navy and is based on his Staff College Research Paper. It was obviously written prior to the events of 11 September 2001 and focuses mainly on the Clinton administration's approach to Ballistic Missile Defence. As such it represents an admirably clear exposition of the arguments over this controversial issue. It will therefore prove to be an excellent starting point for those attempting to form a view on the developing themes of the new administration in Washington.

The fifth article is by Wing Commander W J Millington and is again the product of Staff College research. The study explores the rôle of deception operations in the modern battlespace concluding that strategic and operational deception is possible notwithstanding improvements in ISTAR platforms.



The next article revisits the Dresden controversy and is by Mr Eric Thale. Mr Thale was a young Lancaster pilot who actually flew on the raid. His thoughts on the subject, along with his collection of contemporary documents, provide vital oral history and the unique opportunity to publish primary source material. The Management Board has deliberately avoided the temptation to edit or rephrase his comments into more 'politically correct' language as to do so would spoil the tone and vitality of his contribution.

The final piece in this edition is a new departure for Air Power Review. Debate on air power issues has been lively since the earliest days of flight. Given that the core capabilities of air power were evident by the Battle of the Somme, it should not be surprising that key features were as relevant in the inter-war years as they are today. We have therefore decided to reproduce, on an occasional basis, suitable material from the archives. The inaugural 'blast from the past' was written by Colonel JFC Fuller (later Major General) who by 1930 had been acknowledged as one of this country's leading military theorists. His piece on the 'Supremacy of Air Power' was published in the RAF Quarterly in 1930 – the first year of its existence. The article highlights a number of interesting features beyond its immediate content. The first of these is that soldiers such as Fuller (and Liddle-Hart) were noticeably vociferous in their advocacy of air power. They were also – arguably – more widely read then, and quoted more frequently than those whom we now consider to be key air power theorists of the age.

D DEF S (RAF)



AIR POWER and Levels of Warfare

'This distinction between the two kinds of war is a matter of actual fact. But no less practical is the importance of another point that must be made absolutely clear, namely that war is nothing but the continuation of policy with other means.'

Clausewitz¹



This opening statement by Clausewitz occurs in a section entitled 'Two Notes by the Author on His Plans for Revising On War'. It highlights the tacit acceptance by Clausewitz, and arguably by the majority of his contemporaries, that warfare was not something that could be conveniently lumped into a single category.² The juxtaposition of this seemingly simple statement with his famous utterance on war as an extension of policy emphasises the complexity not only of warfare per se, but also of the whole spectrum of national policy and international relations. Clausewitz seeks to differentiate between the sort of conflict in which the object is to 'overthrow the enemy – to render him politically helpless or militarily impotent thus forcing him to sign whatever peace we please; or merely to occupy some of his frontier districts so that we can annex them or use them for bargaining at the peace negotiations'³ [emphasis in the original].

What is arguably now more important is the recognition that what may be a regional conflict for one side could well be a war of national survival for the other; the American experience in Vietnam is a classic example of this disparity...

This distinction between total and limited warfare has had considerable resonance for later scholars and is especially relevant today. The spectrum of conflict has, however, expanded to include terrorism (or probably more correctly, counter-terrorism), insurgency, peace keeping, peace enforcement and so forth.⁴ What is arguably now more important is the recognition that what may be a regional conflict for one side could well be a war of national survival for the other; the American experience in Vietnam is a classic example of this disparity with a healthy degree of ideology added to the mix.⁵ The boundaries between terrorism, insurgency and open warfare inevitably blur. For the commander of today, these difficulties are compounded by the overlap between levels as well as types of warfare. Again, the tactical level for one side may be of strategic importance for the other. Furthermore, there can be unforeseen consequences, at the strategic level, for third parties if there is spillover (especially of a humanitarian nature) from localised action. It is therefore vital that a commander intuitively understand the levels of warfare and the precise terminology appertaining to the type of warfare in which he is proposing to engage. Definitions and terminology must also be fully understood by his staff and coalition partners. The most difficult aspect of the planning process, however, is the challenge involved in analysing the situation from the perspectives of others – especially from varying cultural, religious or ideological backgrounds.

Most military strategists and practitioners are at their happiest dealing with conventional force on force scenarios in which they are pitted against a culturally compatible foe. The writings of our favourite dead German and Chinese strategists can then be dusted off and applied in suitably selective way – appropriate Clausewitzian centres of gravity can be identified and so forth. The lessons of history can be plundered on an equally selective basis and used as compelling precedents with gay abandon. Intelligence is relatively easy to target, gather and analyse; electronic and technical means are likely to prove to be perfectly adequate for the vast majority of tasks with little real need for human sources. Our doctrine – at all levels – works and we operate well within the comfort zone. Academic or conceptual debate can be limited to the balance between attritional and manoeuvrist warfare. Predictably, the danger of operating within comfort zones is over-familiarity and complacency. Worse still, the thought processes and style of analysis are not ideally suited to the vast majority of the real conflicts in which we are likely to be called upon to operate.

The need to be able to work outside the practical and cultural norms was thrown into cruel and stark focus by the tragic attacks of

The perpetrators of the atrocities on the Pentagon and the World Trade Center were evidently aware of the likely impact of their actions...





11 September 2001. The worst fears of asymmetric warfare were realised and the concomitant need to respond highlighted the difficulties and complexities. Similarly, the events themselves, and the rhetoric that followed, emphasised the need for very precise use of terminology. President George W Bush's unfortunate use of the word 'crusade' was noted in many quarters and undoubtedly presented the opposition with an information operations 'gift'. The ensuing efforts to disengage from the faux pas compounded the difficulties as it became obvious that American ambivalence to the classical use of the word was but the tip of the iceberg. Similarly, Secretary of State Colin Powell's declaration of 'war on terrorism' has the potential for unfortunate repercussions.⁶ Not least of these is the risk of according the international legal benefits of the status of 'combatant' on terrorists; something that the United Kingdom government assiduously avoided over the years of fighting Irish terrorism. Academics variously challenged the validity of waging war on a technique and, more scathingly, on an adjective.⁷

The events of 11 September (or 9-11 as it has increasingly become in American parlance) also brought into sharper focus the dangers of casual use of descriptive phrases such as 'fundamentalist Islamic terrorists' – not least because of the risk of giving offence to the huge numbers of followers of Islam (or any religion for that matter) who are not of a fundamentalist persuasion. Offence is also inevitable with regular juxtaposition of Islamic and terrorist where again it is evident that the vast majority are peace loving and would answer neither to terrorist nor freedom fighter. Being unaware of, or ambivalent towards, the risk of causing such offence does not in any way mitigate its seriousness. If anything, the sin is compounded by the inability to see events from others' perspectives.

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Seeing events through the eyes of others is an essential analytical tool that extends across the entire spectrum of human relations. It is absolutely indispensable in intelligence analysis. But it is also a considerable virtue for any commander to be able second-guess his adversary. Wellington drew attention to the need to see beyond the far side of the hill; but he also appreciated the importance of gauging enemy intentions. This task is made considerably more difficult when operating across, or outside, cultural norms. The perpetrators of the atrocities on the Pentagon and the World Trade Center were evidently aware of the likely impact of their actions and of the probable reactions. The norms against inflicting civilian casualties on such scale were irrelevant to the Al Qa'eda organisation in terms of inhibiting their actions. But they were well aware of the potential physical and psychological impression that it would leave. Their ability to gauge the impact of their actions on the target society enabled the Al Qa'eda cynically to use air power for genuine strategic effect.

Having discussed the need for precise terminology and then introduced air power into the equation, it becomes immediately evident that operations involving weapons with such devastating potential effect must be conducted with extreme care. It would, for example, be totally pointless to expend million-dollar munitions, capable of real effect, on moving rubble around a desolate landscape unless one's analysis of the potential psychological effect was absolutely accurate. Defining the likely effect



4

is never easy – particularly at the strategic level. In the first instance, the commander must look at our definition of strategic and then compare this with the definition likely to be used by the opponent. The likely effect or impact will be a critical factor in the target clearance process where the risk of collateral and casualties (and therefore political fallout) must be weighed against the potential gain. With air power now almost invariably the weapon of first political choice, it is vital that politicians, policy makers, the commander, his planning staff and the crews involved fully understand these complexities.

LEVELS OF WARFARE

The approach to any potential or actual conflict will inevitably be multi-dimensional. For the purposes of this paper, the conflict will be viewed in terms of a three-dimensional graph. The axes will reflect the scale of effort, the level of warfare and the nature of the conflict. Any use of armed force can then be displayed graphically. For each conflict, there will be a minimum of four such graphs. The first will be the commander's own view of the conflict; the second will be the commander's assessment of the enemy's perceptions. There will be two corresponding mirror images showing the enemy's outlook and his perception of his foe's approach. With a coalition the picture will be further complicated. The likelihood of a perfect match in these four (or more) graphs is miniscule. The resulting confusion is part of the fog of war. But that does not mean that this should be accepted fatalistically. Nor should we allow the situation to be made worse through sloppy use of terminology.

THE IMPORTANCE OF THE LEVELS OF WARFARE

The levels of warfare provide a useful framework within which we analyse political and military activity. They also provide a workable structure on which to build the command and control network.⁸ Depending on the nature of the conflict, the formal levels of warfare can be seen as anything from boon to irrelevance. They overlap in all forms of military operation with labels such as 'the tactical general' and the 'strategic corporal' adding to the confusion.⁹ With smaller scale operations, however, the existence of levels of warfare can act as a safeguard against the potential for meddling that is increasingly prevalent as information technology and networks allow more players access to the fight. NATO doctrine acknowledges four discrete levels of warfare and the United Kingdom has based its doctrine thereon.¹⁰ These encompass the Grand Strategic, the Military Strategic, the Operational and the Tactical.

THE STRATEGIC LEVEL OF WAR

The strategic level of war can be considered to be the most complex to discuss – not least because it is the furthest from the comfort zone of tactical level, or technological, warfare. For the purposes of this paper, both of the strategic levels will be considered together. The interdependent nature of these levels makes this a reasonable proposition as does the importance of the use of air power at this level of warfare.



The Grand Strategic level of warfare encompasses the full range of issues likely to be considered at the most senior levels (prime ministers, presidents and their most senior ministers)

The Grand Strategic level of warfare encompasses the full range of issues likely to be considered at the most senior levels (prime ministers, presidents and their most senior ministers). Maintenance of Alliance security, territorial integrity, serious humanitarian disasters and, most recently, the fight against international terrorism are all likely reasons for summits at this level. Historical examples abound such as the discussions between Roosevelt, Churchill and Stalin at Yalta.

Contemporary examples include Alliance discussion on the need to tackle Kosovo in 1999 and the coalition against international terrorism. Grand strategy does not just include military action; economic and political power must also be integrated in order that synergy results. The key concept is that all efforts must be integrated. Those familiar with the conduct of military operations know only too well of the problems in orchestrating all elements of the air line of operations let alone across all components (land, maritime, logistical, special forces and so forth). To do so across the complete spectrum of the strategic level is considerably more difficult for several reasons. The first of these is the need for intellectual horsepower in grasping the diverse strands without recourse to meddling in detail. The second problem is that few states have a functioning co-ordination mechanism that has been tested or exercised (unlike the military who do so as a matter of course). Third, military doctrine, training and conceptual thinking equips future commanders with some background for the forthcoming conflict. Senior officials in other organisations are often more focussed on low level, routine peacetime functions.¹¹ Finally, no matter the seriousness of the crisis, human nature is such that individuals will always seek to better their own position, or that of their organisation, at the expense of others.¹²

British Defence Doctrine correctly identifies economic, political and military force as being the three principal instruments of national power. But it must also be remembered that power does not operate in a vacuum. Those charged with the formulation of grand strategy need also to be aware of the lower level political, social and moral factors at work in their domestic environments and in the target communities.¹³ This can be difficult enough with one country, but the complications multiply several-fold across a coalition. These areas must be further expanded to include intellectual, psychological and cultural issues; differing approaches and interpretations of international law should be considered within the intellectual framework. Ethical issues may seem to be self-evident in what appears to be the relief of major humanitarian distress or the fight against international terrorism. But the shattering of over 50 years of international recognition of the sanctity of the state within the United Nations Charter was, for some, too great a price to pay for action in Kosovo. Likewise conviction that your own side has the moral right on its side may be feasible with Hitler as one's foe,¹⁴ but is less convincing when the spectre of Christianity against Islam comes under consideration. At first sight all of

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these areas seem obvious, but the risks of failing to tackle any one of them may prove to be fatal to the enterprise.

Intelligence can, and indeed must, be considered at every level of warfare. Funding for intelligence is, however, sanctioned at the highest levels of government as are the targeting priorities. Responsibility for so-called ‘intelligence failures’ can often be laid at this door. Likewise decisions to share material and assessments are matters of grand strategic importance. The balance of risk in compromising sources as against convincing domestic and coalition audiences is again a matter for the highest level of decision-making. The most stunning military campaign will be fatally flawed – or irrelevant – if the high-level decision-making is based on poor strategic intelligence: arguably the political and economic dimensions are even more dependent on sound intelligence collection and assessment.

As the almost invariable weapon of first political choice, air power is of vital importance at the grand strategic level. The historical precedent for this has an immaculate pedigree with Churchill regularly using the efforts – and sacrifices – of Bomber Command as evidence to Stalin that there was indeed a second front during the dark days of 1942-43.¹⁵ Whilst Stalin was characteristically immune to concerns over the Command’s casualties, he was certainly appreciative of the damage wrought and avidly awaited updates of the photographic diaries. Irrespective of the actual damage to the German strategic war efforts, it is worth noting the strategic effect on allies. Grand strategy encompassing as it does the economic and political (domestic and international) means that air power can have strategic effect against these mechanisms of state power. Allied bombing had considerable impact on the German war economy and on the internal political scene. Goering’s failure (or more correctly the Luftwaffe under his direction and exacerbated by Hitler’s meddling) to stem the Bomber tide led directly to his eclipse by Goebbels.¹⁶

The use of air power to satisfy grand strategic level appetites was immediately evident at the start of Operation Allied Force and the air operations over Serbia in 1999. Here it was abundantly evident that the use of air power was the only military force that the NATO Alliance was prepared to use and then only for a short period of time. The fact that NATO resilience was increased by the wave of ethnic cleansing that swept over Kosovo after the start of the campaign should not detract from the conduct of the air war or, more importantly, its overall success. The early use of air power over Afghanistan was both logical and essential for the conduct of land operations within normal doctrinal boundaries and in the Robert A Pape, *Bombing to Win* sense of coercion.¹⁷ But it also played an important role at the grand strategic level in satisfying demands for action within the constraints of maintaining the international coalition.

Military strategy is that part of grand strategy where military force is introduced. This, traditionally, is the province of the Chiefs of Staff. In Cabinet types of government they reflect the military view to the prime minister and then implement the chosen course of action – usually under the direction of the appropriate minister. In practical terms, military strategy exists permanently; the nature



of modern conflict is such that we cannot rely on gathering men and matériel at the last moment. It may seem self-evident that the days of cutting yew for longbows and raising levies have long gone. But the outbreak of World War I saw the United Kingdom configured for the wrong sort of conflict and preparations for the start of World War II was a close-run thing. Military strategy therefore encompasses recruitment, education, training, armament, doctrine formulation and so forth,¹⁸ as well as the military response to a crisis.

...the outbreak of World War I saw the United Kingdom configured for the wrong sort of conflict and preparations for the start of World War II was a close-run thing

The inter-relationship between strategy, policy and doctrine is potentially vexatious, with considerable scope for divisive turf wars. For the purposes of this paper, doctrine is defined as the ‘*fundamental principles by which military forces guide their actions in support of objectives*’.¹⁹ Policy is the nation’s response to the prevailing external environment.²⁰ This is constantly changing. The environment may be the long-term situation such as the backdrop to the Strategic Defence Review. It may equally be the response to a given crisis. Policy effectively enunciates what will be done (or attempted); doctrine provides the fundamental principles suggesting how it could (or should, depending on the degree of prescription) be done. The formulation of strategy is the fusion of these fundamental principles with the policy demands of the government or coalition. The resulting strategy will not be fixed; it must reflect the changes in the external environment. In an ideal functioning democracy there should be no question whatsoever about which has primacy. The government will make policy based on best advice which will invariably be consistent with well formed doctrine: flawless strategy will result.

The key tenets of air power – ubiquity, flexibility, rapidity and so forth – will ensure that debate will ensue at the military strategic level whether this be short or long term

Strategy is therefore what must be done to achieve either national or grand strategic coalition objectives. It is necessarily concerned with the military force to be utilised, the resources allocated and the constraints to be applied.²¹ Air power will feature in virtually every conceivable deployment of military force from humanitarian relief to full-scale conflict. The key tenets of air power – ubiquity, flexibility, rapidity and so forth – will ensure that debate will ensue at the military strategic level whether this be short or long term. In the formulation of defence policy – in most nations – some degree of air power will be seen as a necessary part of a balanced force. As part of this long term planning, consideration will be given to the capabilities, readiness states and sustainability of the force rather than just the platforms and their associated weapons systems. In response to a specific crisis, the operational commander will be allocated resources and will be given guidance from staffs at the military strategic level. There is clearly scope for friction in this interaction with perceptions that ‘soldiers in suits’ do not understand the practicalities of the operation. The reality, however, is that those at the military strategic level are aware of the political nuances at national and international levels.



8

Decisions on allocation of air assets, and more importantly their targeting are often taken at the military strategic level. Again the pedigree for this is extensive. Churchill was never slow to direct Bomber Command, not only on the general priorities (oil, industry etc), but also on specific towns. After he had tasked the Air Ministry with attacks on cities in East Germany in January 1945, Churchill was less than convinced that his Secretary of State for Air was prosecuting the targets with due vigour. His blistering response is worthy of quotation in full:

*'I did not ask you last night about plans for harrying the German retreat from Breslau. On the contrary, I asked whether Berlin and no doubt other large cities in East Germany, should not now be considered especially attractive targets. I am glad that this is 'under examination'. Pray report to me tomorrow what is going to be done.'*²²

The American experience with Vietnam highlights even more vividly the scope for politicians to become seriously involved at the tactical, let alone operational level of war instead of remaining detached. Clodfelter describes, in considerable detail, the process that Lyndon Johnson used with his infamous 'Tuesday luncheons' at which targeting priorities and individual targets were chosen; air commanders were only ever given part of the story and confusion was the order of the day.²³ In more recent operations, the availability of data link communications allows politicians, and commanders, an unprecedented opportunity to play at the tactical level.

Any discussion on air power at the strategic level must also encompass the debate on the use of air power for strategic effect. This phrase is used quite specifically to separate it from previous concepts of strategic bombing.²⁴ The critical point is that the adjective 'strategic' must be applied to the effect that is sought – not the range of the aircraft, the weapons system or its warhead.

British Air Power Doctrine recognizes a single centre of gravity at the strategic and operational levels, but not in the tactical arena (unlike other forces that accept a number of centres at each of the higher levels). This effect could theoretically be created by independent and distinct use of air power alone, or, more likely, it will be part of joint or multi-national activity. Air operations for strategic effect are aimed to destroy or disrupt the defined strategic centre of gravity of an opponent.²⁵ Considerable care must be taken in the selection of the centre of gravity. This may seem self-evident, but severe consequences follow if it is wrongly identified, destroyed and the anticipated benefits do not accrue. To achieve the desired effect, the centre of gravity must be analysed from the perspective of the enemy commander; there is no point whatsoever in viewing prospective target sets through western centric eyes, or, even worse, on the basis that we have weapons available that are suited to – say bridges or power stations. It is worth emphasising at this point that the effect sought by the use of air power may not necessarily be the physical destruction of the chosen target set. Indeed, the centre of gravity may not be the enemy's army

Churchill was never slow to direct Bomber Command, not only on the general priorities (oil, industry etc), but also on specific towns





(which Clausewitz saw as being the natural choice); it may be as ephemeral as a despot's ability to further his family's fortunes and influence – as was probably the case with Milosevic. Warden has suggested that attacking the leadership of a foe could lead to strategic paralysis, thereby possibly obviating the need for attacks on fielded forces.²⁶ Air assets other than attack aircraft may, however, be involved in strategic air operations. Activities such as supervision of a no-fly zone or the provision of relief supplies may have strategic effect, depending on the circumstances prevailing at the time.

The objective of strategic air operations, consistent with the tenets of manoeuvre warfare, is to shatter the enemy's cohesion and will – not just to destroy men and materiel. Target sets will have been selected, as part of the estimate process, for their strategic relevance and may include the machinery of government, military forces, infrastructure and so forth.²⁷ Given the flexibility of air power, other targets at the operational and tactical levels may be attacked in parallel with, or subsequent to, strategic operations. The target sets at this high level of operations, and the weapons proposed, will inevitably excite considerable political, legal and humanitarian interest in the highest spheres of governmental machinery. Whilst the military preference is for the espousal of a clear political aim followed by centralised planning and then decentralised execution, it is entirely proper in a democratically accountable structure that political oversight is maintained. This is bound to be most appropriate, and most contentious, at the strategic level. The possible necessity of maintaining coalition solidarity may make this aspect of an operation or campaign particularly fraught.

A more lengthy exposition on the use of strategic air power is clearly beyond the scope of this paper. The key tenets, however, are that the term 'strategic' applies to the effect – not the platform. Second, the use of air power for strategic effect is not about air power doing it alone. Third, the effects sought must be seen from the enemy perspective – as Al Qa'eda proved on 11 September.

THE OPERATIONAL LEVEL

The operational level of war is that at which campaigns are planned and conducted by the duly appointed Joint Commander and then the Joint Task Force Commander when deployed.²⁸ Again it is incumbent on the JTFC, and his Component Commanders, to maintain links with the strategic level and to keep an overview of the whole theatre of operations. They must also refrain from meddling at the tactical level. Some have argued that there is little scope in modern warfare for this level of warfare. The basic premise is that modern communications allow a military strategic level commander to direct operations at the tactical level without the intervening layer. Part of the argument is based on the likelihood that we are unlikely to see the multi-theatre operations that were evident in World War II. It has also been suggested that the extra layer is little more than an encumbrance, adding little of value. Liddell-Hart referred to the gap between tactics and strategy as 'grand tactics'.²⁹ To a large extent, the terminology is not relevant as there is a real void between the levels either side. More importantly, the use of the operational level of war allows one delegated commander the scope to view his theatre of conflict at one sweep. He has certain geographic bounds to consider; but these must be logically chosen both in terms of his forces and those of the enemy. There is little point in constraining a commander artificially when his foe has free reign to move around the boundaries necessitating vexatious liaison with neighbouring allies.³⁰

The operational level of war also allows the commander – from whichever environment (land, sea or air) – to apply operational art. This encompasses the concept of being able to co-ordinate manoeuvre warfare at the theatre level. This in turn facilitates a genuine manoeuvrist approach to the fight. Manoeuvre is straight-forward and allows for movement rather than static lines. The manoeuvrist approach is of a more conceptual nature in which the commander seeks to shatter cohesion and will (as above with the use of air power for strategic effect). Significant features obviously include momentum, shock action, tempo and surprise. The emphasis is on causing disruption through the application of pressure on points where it is unacceptable to the foe. The manoeuvrist approach is not a substitute for attritional warfare; some degree of killing and destruction is inevitable and indeed desirable (politically incorrect that this may sound). But it seeks to prevent the static slaughter that epitomised the so-called Great War.³¹ There is no requirement to hold ground for its own sake. The manoeuvrist approach is immediately attractive to the numerically weaker side and this is to some extent a reflection of its introduction into British Doctrine during the 1980s in Germany. Operational art extends beyond the manoeuvrist approach; but it is one technique available to the operational commander in his quest to meet strategic goals.

A key means of causing disruption is to break, or get inside, the enemy's OODA loop [Observe, Orientate, Decide and Act]³² thus achieving a superior operational tempo.³³ Degradation of the enemy command system – at the same time as protection of one's own – can be achieved in a number of ways including offensive information operations, Israeli-style assassination or physical destruction.

It can be seen from this discussion on the operational level of war, operational art and the manoeuvrist approach that air power is the ideal means of prosecution.³⁴ The characteristics of range, flexibility and ubiquity are tailor-made for this type of warfare. Furthermore, the gathering and dissemination of information are clearly tasks that can be easily carried out by air platforms. First attempts to destroy the will of the enemy to continue the fight may be unsuccessful and attrition may be necessary. Air-delivered fire power not only has the ability to destroy assets physically; it is also a most useful weapon in the psychological battle where the unheralded application of death and destruction can help to undermine will.³⁵ This is a vital step on the road to shattering cohesion.

A significant, indeed vital, contribution that air power can make at theatre, or operational, level is control of the air. This may be air parity as achieved over Dunkirk enabling the evacuation to proceed; or it may be up to air supremacy. The sentiment that if control of the air is lost, the battle follows very shortly thereafter has been

The operational level of war also allows the commander – from whichever environment (land, sea or air) – to apply operational art





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. Conflict in Korea, Vietnam, the Gulf and most recently over Afghanistan merely served to accentuate the vital nature of control of the air. The reality is that this must be fought for, won and then maintained. Control of the air is essential – not an optional extra. No commander is likely to be unaware of the benefits of being able to operate free from interference.

THE TACTICAL LEVEL

The tactical level of warfare can extend from hand-to-hand fighting through to manoeuvre at corps level. The scale is relative; the important concept is that this is where the fighting takes place. It involves the disposition of forces and their direct support. It is important to remember that this is the core business of the component commanders and their subordinates – not for more senior commanders who would wish to descend to their comfort zone in the manner of Marshal Bazaine in the Franco-Prussian War.³⁶

From an air power perspective, it is immediately self-evident that all aspects of tactical conflict lend themselves to the application of firepower from the third dimension. Again the platform and weapon system are not critical – A B2 can be used for tactical effect. B52s have been used on a regular basis for attacks on trench lines and so forth.

THE NATURE OF WARFARE – TERRORISM

The third axis outlined above describes the type of conflict, ranging from terrorism through insurgency to full-scale warfare. It must be recalled at this stage that what may be terrorism to one side may be at a different level to the perpetrators. Most conventional terrorist movements exist because of a deep-rooted political grievance. This may be based on demands for self-determination or similar nationalist causes; the Irish Republican Army (in its various guises) and the Basque separatist movements are obvious examples of this genre. There may also be an underlying civil rights movement that has not found satisfaction in the democratic process. Again this was partly behind the resurgence of the Republican movement in Northern Ireland in the late-1960s which resulted in the emergence of the Provisional IRA.³⁷ With all groups, there is almost invariably a perception of having a just cause. The only exception is where an anarchist group is intent on causing destruction for its own sake; their rationale is based on an interpretation of Sartre philosophy in which a new society can only emerge from the ashes of the old decadence.³⁸ It is debatable whether groups such as Al Qa'eda and Hamas fall into the first category, albeit with huge scope to their political aims. It has been suggested that they are in a new category of their own.

Most conventional terrorist movements exist because of a deep-rooted political grievance. This may be based on demands for self-determination or similar nationalist causes...

Terrorism often finds its roots in poverty and unemployment where the political agenda finds a base level of popular support among the disenfranchised or those with grievances. The terrorist group takes this as being a de facto mandate. The more sophisticated movements extend this by establishing militant political groups to express their propaganda message from a semi-legitimate soapbox. Sinn Fein and Heri Batasuna (the front for ETA in Spain) are again the obvious examples. It is self-evident that the terrorist movement is dependent on the population for initial recruitment, whether this be from the hamlets of Afghanistan or the Falls Road in Belfast. But the terrorist groups will then usually operate autonomously not least for security reasons. The terrorist cell can obviously be deployed to operate well away from the original source of grievance as the Provisional IRA did when conducting their continental campaign against United Kingdom armed forces' targets in Germany and the Netherlands in the late-1980s. In addition to facilitating security, the cellular nature also allows for real mission command to be exercised with what needs to be done pre-briefed, but not the minutiae of exactly how to do it. Communications can then be minimised.

State-sponsored terrorism brings its own challenges in that the root cause of the conflict will almost certainly be between states rather than intra-state tensions. The rifts between states may be religious, ideological, cultural, economic, political or an unhealthy mix between them all. If left unchecked there is a risk of alienation and radicalisation. In this case the Clash of Civilizations suggested by Huntington could become a reality.³⁹ The emergence of groups such as Al Qa'eda show that terrorism can be mounted – in classical cellular fashion – from a variety of host states, but without necessarily their cognisance. All that is needed is finance and communications.

Countering state-sponsored terrorism can be attempted either through action on the sponsor, or on the terrorists themselves. The United States Operation Eldorado Canyon was a classic use of air power against Libya and appears to have been successful insofar as the coercion of Gadaffi was concerned. Evidence suggests that state-sponsored terrorism from organisations based in Libya was at least suspended for several months after the bombing. Action against the perpetrators of the Lockerbie bombing was an effective mix of intelligence and police operations culminating in a formal judicial trial.

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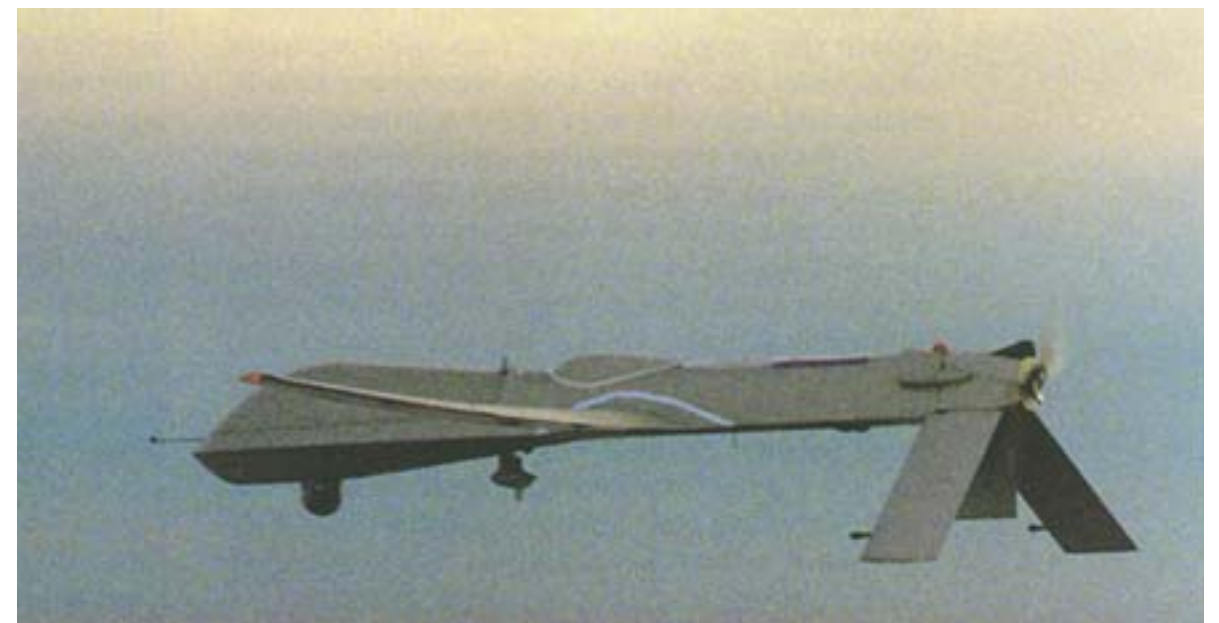


Terrorism can be countered in a number of ways with the emphasis usually being placed on civil police action, albeit with military support where necessary. The terrorists' centre of gravity may often prove to be the risk of marginalisation. Removal of the source of grievance, whether this be poverty, unemployment or the reduction of the relevance of nationalist issues (as is arguably happening in Ireland with the removal of many barriers due to EU membership), will help to undermine the popular support for the terrorists. These processes are inevitably long term – especially where there is a deep-seated religious element to the conflict. Nevertheless, they do eventually work and must be allowed to develop. 'Irreconcilable' is not an acceptable word in the counter-terrorism lexicon. Similarly, it is improbable that dialogue with unsavoury characters will be permanently discounted – officials from Sinn Fein are now in the Northern Ireland Assembly and former 'terrorists' rose to positions of high rank in Israel.

The public relations element of the fight against terrorism is also important with considerable emphasis on not making matters worse. Ideally, the counter-terrorist strategy should aim to eliminate active support for the group and, especially in third countries or neutral areas, to highlight their activities and presence. More active counters include positive attention on a series of lines of operation. Sources of funding and supplies of materiel are obvious examples. Action can also be taken to suborn and infiltrate groups as well as to disrupt operations. Security of potential targets is vital. All counter-terrorism depends on good intelligence with human and technical sources necessary.

Air power can play a vital role in the collection of intelligence using the complete spectrum of sensors to locate personnel, matériel and communications nodes. The last of these can be important where counter-terrorist operations are seeking to act inside the enemy OODA loop. This is challenging when the foe is little more than a youth with a Kalashnikov. But difficulty is the mother of invention and sophisticated systems have been brought into service in a number of nations. Acting close to real-time also brings command and control challenges with political authority to engage either being delegated or passed through suitable communications systems; Israel's battle against Palestinian terrorism, with air-delivered ordnance being used to decapitate senior operatives or leaders. Air power may also provide an invaluable service in the combat support arena with mobility a high priority. It may also be that air supply for humanitarian operations will help to reduce support for terrorists, or indeed insurgents.

Air power can play a vital role in the collection of intelligence using the complete spectrum of sensors to locate personnel, matériel and communications nodes



14 **INSURGENCY**

Insurgency involves a campaign waged by a minority group to gain political power in its own state through a combination of conventional military action, subversion and, classically, propaganda. Counter-insurgency, at its simplest, is the action taken to defeat the threat. A key difference between terrorism and insurgency is the requirement in the latter to win over the middle ground of the population between the insurgents on one hand and the government on the other. Victory in this contest brings popular support and democratic legitimacy. In reality, neither the government nor the insurgents may gain true legitimacy as the respective campaigns may be based on intimidation, fear and oppression – otherwise the ballot-box would have rendered the bullet unnecessary. Britain has considerable experience in this field have fought counter-insurgency campaigns in Palestine (1945-48), Aden (1964-67), Malaya (1948-60) and Dhofar (1970-75); the latter two were considerably more successful than the two former operations.

According to Sir Robert Thompson, there are a number of key principles necessary to counter insurgency.⁴⁰ These include the need for the government to function in accordance with the law, and in furtherance of a free democratic society; the counter-insurgency plan must be part of a greater concept for removing the sources of injustice and subversion; and that the government must secure its own bases as a matter of priority. UK doctrine encompasses these priorities along with the advice iterated by General Sir Frank Kitson in Low Intensity Operations regarding the primacy of intelligence.⁴¹ The shorthand for these operations has become ‘hearts and minds’.

The key area is first and foremost political primacy with a concomitant need for real co-ordination within the government hierarchy and machinery. This is particularly relevant if the insurgents are supported by a third party government that must not be aggravated (as was the case in Vietnam). As has been stated, intelligence is of the utmost importance. The insurgents must then be separated from the ‘middle ground’ either physically or through ‘hearts and minds’ information operations; these may also involve provision of real support at village level as happened in Malaya. If these actions are carried out consistently and effectively, the aim is to isolate and then neutralise the insurgent. There is considerable scope for air power to operate in every phase of these tasks ranging from combat support air operations, through direct air operations to interdiction; Kitson warns, in classic army style, that the commander must beware going from place to place by air and not absorbing the ‘feel’ of the scene.⁴² His warnings have equal validity at the strategic level in that the use of air alone will not get to the ‘hearts and minds’ other than possibly through intimidation and this may be counter-productive.



FORCE ON FORCE CONFLICT – SOME CONCLUSIONS

Straightforward force on force conflict is, relatively speaking, the realm of comfort zone operations. The vast amount of doctrine, strategy, tactics and training can be brought to the task. Clear political objectives can be set, the politicians brushed to one side and the generals can revel in what they have been waiting for all of their careers. It is therefore inevitable that each of these types of warfare will see a tendency for their scale to be inflated. Counter-terrorism will approach the scale of counter-insurgency and so forth. And yet for each quite specific style of warfare the fundamentals of levels of warfare are equally relevant. The critical factor is that relevant and achievable policy should be compatible with what the situation demands. Vibrant, living doctrine must then be applied: coherent, credible strategy will result. What must be avoided, at all costs, is a scattergun approach based on ‘we bomb bridges because we can’ style of logic. Intelligence and information – and the critical analysis thereof – are vital in all forms, and at all levels, of warfare. The need to bring coalition partners along in an attempt to counter international terrorism or quell an insurgency will inevitably complicate matters, but must of necessity be done.

The debate on levels of warfare and types of warfare will continue. It is important that the debate focuses on substantive issues not just the labels. The reality is that the levels of warfare bring some clarity to the planning process and their inclusion in the realms of doctrine can only serve to aid understanding. It is, however, equally important to view each potential conflict from each corner of the set of graphs so that the contest is not just seen from one’s own perspective. Terrorist to freedom fighter is relatively simple; limited conflict from one perspective does not chime easily with a fight for the birth of a nation.

- 1 Carl von Clausewitz, *On War*, Edited and translated by Michael Howard and Peter Paret, Princeton University Press, Princeton NJ, 1976, page 69.
- 2 Michael Howard, *Clausewitz*, Oxford University Press, Oxford, 1983, page 47.
- 3 Clausewitz, *ibid*, page 69.
- 4 See chapter 1 of AP 3000, *British Air Power Doctrine*, 3rd Edition, HMSO, 2000. This covers the nature of war and armed conflict.
- 5 See, for example Mark Clodfelter, *The Limits of Air Power; the American Bombing of North Vietnam*, Free Press New York, 1989 and Harry G Summers, *On Strategy: A Critical Analysis of the Vietnam War*, Presidio Press, Novato CA, 1982.
- 6 See Sir Michael Howard's outstanding analysis delivered at the Royal United Services Institute/ Guardian Conference held on 30 October 2001. Full text available, *Mistake to declare this a war* on http://www.thisislondon..c.../html?in_review_id=470295&in_review_text_id+42215.
- 7 Sir Michael Howard, *Mistake to declare this a war*, *ibid*.
- 8 See Joint Warfare Publication 0-01, *British Defence Doctrine*, second edition, 2001.
- 9 These refer to the evident penchant for politicians and senior officers to meddle in comfort zone detail. On the other hand the actions of a corporal in charge of a small team can have serious strategic consequences – especially under the eyes of the media.
- 10 BDD, *ibid*, page 1-2.
- 11 This is not new. Harris, in characteristic fashion, when he was DCAS in the Air Ministry challenged a civil servant to explain 'what aspect of the war effort he was retarding today'. Probert, *Bomber Harris: His Life and Times*, Greenhill Books, London, 2001, page 201. Interestingly Sir John Keegan also picked on this quotation in his *Daily Telegraph* review of Probert's book.
- 12 This again is not new. One need only look at the conflict between ministries in World War II and between commanders and the Air Ministry (e.g. Dowding and Harris).
- 13 Colin S Gray, *Modern Strategy*, Oxford University Press, Oxford, page 23 and Michael Howard, 'The Forgotten Dimensions of Strategy', *Foreign Affairs*, 57(1979), 976-86.
- 14 Richard Overy, *Why the Allies Won*, Pimlico, London, 1995, page 312. Overy contends that 'Whatever the rights and wrongs of the Allied cause, the belief that they fought on the side of righteousness equipped them powerful moral argument'. Gray is somewhat sceptical of this; Colin S Gray, *Modern Strategy*, page 31.
- 15 See Henry Probert, *Bomber Harris*, pages 146-147 and 267.
- 16 Richard Overy, *The Air War 1939-1945*, Stein and Day, New York, 1981, page 156.
- 17 Robert A Pape, *Bombing to Win: Air Power and Coercion in War*, Cornell, Ithaca, 1996.
- 18 As was evident in the Strategic Defence Review. We now take this work for granted, but it highlights the lacuna that preceded its formulation.
- 19 Standard NATO definition reiterated in BDD page 1-1.
- 20 BDD, *ibid*, 1-5.
- 21 AP 3000, *ibid*, 1.1.2.
- 22 Webster and Frankland, *ibid*, page 103.
- 23 Clodfelter, *The Limits of Air Power*, pages 120-121.
- 24 See AP 3000, Chapter 6 and many journal articles. For example: Mark J Conversino, 'The Changed Nature of Strategic Air Attack', *Parameters*, Winter 1997-98, pages 28-41; Major Stephen T Ganyard, USMC, 'Strategic Air Power Didn't Work', *Proceedings*, August 1995; Jeffrey Record, 'The Never-Ending Bomber Debate', *Strategic Review*, Fall 1995.
- 25 *Ibid*, page 2.6.1.

- 26 John A Warden III, *The Air Campaign*, (New York: toExcel), 1998; the original version was first published in 1989 and was highly influential in the Gulf War air campaign.
- 27 Conversino, 'The Changed Nature of Strategic Air Attack', page 36.
- 28 BDD, *ibid*, page 1-2.
- 29 Discussed further by Edward N. Luttwak, 'The Operational Level of War', *International Security*, Winter 1980-81, pages 61-79.
- 30 Ironically Northern and Southern Watches in Iraq come under different CinCs – CENTCOM and EUCOM.
- 31 This view is not strictly accurate. It could very easily be argued that a sizeable amount of attrition was essential in trench warfare exactly to shatter cohesion and will when manoeuvre was impossible. See Gary Sheffield, *Forgotten Victory: The First World War Myths and Reality*, Headline, London, 2001.
- 32 First conceptualised by John Boyd, this concept of acting more quickly than the enemy has been adopted into the doctrine of many fighting forces. For a full review of his life and works, see Grant T Hammond, *Mind of War, John Boyd and American Security*, Smithsonian, Washington, 2001.
- 33 BDD, *ibid*, page 3-5. AP3000 page 2.4.2.
- 34 Again the literature is voluminous. See for example, General Charles L Donnelly Jr, USAF Retd, 'A Theater-Level View of Air Power', *Air Power Journal*, Summer 1987, pages 3-8; Lt Gen Bradley C Hosmer, 'American Air Power and Grand Tactics', *Air Power Journal*, Summer 1987, pages 9-14.
- 35 See Andrew Lambert, *The Psychology of Air Power*, RUSI Whitehall Papers, 1994.
- 36 Baziane was the Commander of the French forces assembled against the Prussian Army. He galloped from end of the battlefield to the other variously pointing cannons, leading cavalry skirmishes and encouraging his troops. The point being that he occupied his time with 'activity for its own sake' neglecting the more proper affairs of a C-in-C.
- 37 The literature on this subject is inevitably voluminous. See, for example, Caroline Kennedy-Pipe, *The Origins of the Present Troubles in Northern Ireland*, Longman, London, 1997, chapters 1 and 2. See also Patrick Bishop and Eamonn Malle, *The Provisional IRA*, Corgi, London 1988 and chapter 7 of Neil Collins and Frank McCann, *Irish Politics Today*, Manchester University Press, Manchester, 1989.
- 38 See Chapter 14 of Richard Clutterbuck, *Protest and the Urban Guerrilla*, Cassell, London, 1973.
- 39 Samuel P Huntington, *The Clash of Civilizations and the Remaking of World Order*, Simon & Schuster, London 1997.
- 40 Sir Robert Thompson, *Defeating Communist Insurgency*, published in 1966.
- 41 [General Sir] Frank Kitson, *Low Intensity Operations; Subversion, Insurgency and Peacekeeping*, Faber and Faber, London, 1971
- 42 Kitson, *ibid*, pages 137-139.



Air Force Transformation

Past, Present, and Future



**General Deptula was Director, Air Force Quadrennial Defense Review, Headquarters USAF. He was the principal planner for the coalition's offensive air campaign during Operation Desert Storm and director of the Expeditionary Aerospace Force implementation.'*

The Air Force defines transformation as fundamental change involving three principal elements and their interactions with one another: (1) *advanced technologies* that, because of the new capability they yield, enable (2) *new concepts of operation* that produce order-of-magnitude increases in our ability to achieve desired military effects, and (3) *organizational change* that codifies the changes in the previous elements or enhances our ability to execute our national-security strategy. From the Air Force point of view, military transformation involves much more than acquiring new systems or reacting to failure. It means actually shaping the course of change through aggressive, integrated, and coherent change processes. The Air Force approach to transformation also embraces the notion that we cannot achieve meaningful transformation without integrating our expanding capabilities with those of the other services and elements of national power. In light of this definition, this article briefly describes the transformation the Air Force went through in the early 1990s, is going through today, and is planning for the future.

The best way to illustrate the Air Force's transformation philosophy is to offer some recent examples.

The Gulf War

Prior to 1991, two separate, leap-ahead military technologies had matured enough to offer an order-of-magnitude breakthrough. The first was low-observable (i.e., stealth) technology, and the second was the development of precision-guided munitions. Together, these two capabilities, in conjunction with an effects-based planning methodology, allowed US forces to execute an innovative concept of operations that has come to be known as *parallel warfare*. Simply put, parallel warfare is the simultaneous application of force across the breadth and depth of an entire theater.

In the first *24 hours* of the Gulf War, US aerospace power launched attacks against over 150 separate and distinct targets – more than were engaged in the years 1942 and 1943 in the Combined Bomber Offensive of World War II and many orders of magnitude greater in terms of force-application capability (a feat yet to be acknowledged in some circles). It had a devastating impact on Iraq's ability to wage war and played a critical role in the coalition's successful liberation of Kuwait – achieved at far less cost in lives than anyone expected before the war began.

Technology and new operational concepts do not tell the entire story, however. The air campaign that set the conditions for victory in the Gulf War could not have happened without the organizational innovation that emerged from the Goldwater-Nichols Department of Defense Reorganization Act of 1986. That new joint-war-fighting structure allowed the centralized control of American forces through the joint force commander and of all US airpower, regardless of service affiliation, through the joint force air component commander. The results were a lightning-quick victory for the coalition that saved thousands of American and Iraqi lives. These Gulf War

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breakthroughs hinted at a larger transformation still to come – one that is still evolving with stealth, precision, parallel war, and centralized aerospace control.

End of the Cold War

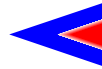
Some revolutions have a short shelf life. What seems unique at the time tends to become the norm. America became accustomed to seeing surgical strikes and Iraqi soldiers surrendering en masse – stealth and precision, once revealed, became commonplace. But since change is part of our culture, the Air Force, within a mere five months of the Soviet Union's implosion, stood down the venerable Strategic Air Command (SAC), Tactical Air Command (TAC), and Military Airlift Command (MAC), replacing them with two new, more flexible organizations – the integrated Air Combat Command (ACC) and Air Mobility Command (AMC). This was an organizational transformation stunning in scope for such large organizations. After all, many people considered SAC the ultimate symbol of the entire US military and thought of MAC as merely a support organization. Underlying this dramatic change were the internal shocks generated by the Gulf War, which suggested that a new perspective would better serve the nation. No longer were aerospace platforms either “strategic” or “tactical”; neither were airlift and air-refueling assets simply minor “support” functions. What really mattered was how we used our aerospace assets in an integrated way to achieve strategic, operational, and tactical *effects*.

Throughout the decade of the 1990s, the Air Force transformed itself into a force comprised primarily of precision-capable strike aircraft. It delivered the world's first stealth, long-range, high-payload bomber – the B-2. It fielded a full constellation of Global Positioning System satellites that provided precision navigation to the entire joint force, anywhere in the world. It introduced the C-17, able to deliver equipment, personnel, and supplies directly from the United States all the way to a combat zone – a key enabler no other country possesses.

As the grand national-security strategy of containment shifted to one of global engagement, the United States downsized forces, and deployments and operating tempo skyrocketed. Seemingly temporary deployments away from home became semipermanent. Increasingly, the nation relied on aerospace power to shape the world and respond to all kinds of crises – a practice especially evident in a string of contingency operations in Mogadishu and Haiti;

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humanitarian and disaster-relief missions in Latin America, Asia, and Europe; and more combat-focused crises such as the Balkans and the maintenance of air-exclusion zones over northern and southern Iraq.

Expeditionary Aerospace Force Concept

The increased operations tempo and reduced force created a strategy-to-force-structure mismatch. This, in turn, led to recruiting and retention problems and then to our second major post-Cold War organizational transformation. The Air Force developed the Expeditionary Aerospace Force (EAF) concept in 1999 to make itself more flexible and to stem the recruiting and retention downturn. The EAF had at its core the formation of an entirely new way of doing business by using 10 separate Aerospace Expeditionary Forces (AEF) in a rotational concept that provided our airmen predictability and stability. In turn, this supplied the theater commanders in chief with fresh, motivated units made up of active, Guard, and Reserve personnel. Whereas the change from SAC, TAC, and MAC to ACC and AMC had provided an integrated and functional organizational structure, the formation of the EAF was more fundamental. It produced a new, expeditionary mind-set in our people.

The Air Force enjoys an unprecedented level of organizational flexibility that originated in its common heritage. Airmen expect change, look forward to it, and thrive on it. Again, these recent changes and breakthroughs all occurred *within our budgetary means* during a time of downsizing and rising operational tempo. So the three elements that define *transformation* came together in the 1990s – the Air Force has been there and done that, not just talked about it. And the transformation continues.

AIR FORCE MODERNIZATION AND TRANSFORMATION

Air Force modernization is based on revolutionary trends first glimpsed in the Gulf War, the deployment challenges of the post-Cold War environment, and our projections about the future security environment. In order to turn those trends, challenges, and projections into reality, the Air Force has instituted a comprehensive, corporate-style process for tying our vision to the future security environment. It is a process that allows for creativity by focusing not on platforms, but on requirements for future capabilities. Good ideas from laboratory projects, war games, experimentation, actual combat, and a variety of other venues feed into our strategic-planning process and are distilled into 14 “critical future capabilities” (Table 1). The programming process then filters programs through those critical capabilities to ensure that the Air Force is staying on course.

Table 1 – The Air Force’s 14 Critical Future Capabilities

1. Rapidly dominate (within days) adversary air defenses to allow freedom to maneuver, freedom to attack, and freedom from attack.



2. Render an adversary's cruise and ballistic missiles ineffective before launch or soon after.
3. Protect our space assets and deny an adversary space capability.
4. Create desired effects within hours of tasking, anywhere on the globe, including locations deep within an adversary's territory.
5. Provide deterrence against both coercion and attack from weapons of mass destruction by maintaining a credible, land-based nuclear and flexible conventional strike.
6. Create precise effects rapidly, with the ability to retarget quickly, against large, mobile, hidden, or underground target sets anywhere, anytime, in a persistent manner.
7. Assess, plan, and direct aerospace operations anywhere in near real time, tailored across the spectrum of operations and levels of command.
8. Provide continuous, tailored information within minutes of tasking with sufficient accuracy to engage any target in any battle space worldwide.
9. Ensure our use of the information domain, unhindered by all attempts to deny, disrupt, destroy, or corrupt it; also ensure our ability to attack and affect an adversary's information in pursuit of military objectives.
10. Provide the airlift, aerial refueling, and en route infrastructure capability to respond within hours of tasking to support peacetime operations or a crisis.
11. Build an aerospace force that enables robust, distributed military operations with time-definite sustainment.
12. Build a professional cadre to lead and command expeditionary aerospace and joint forces.
13. Implement innovative concepts to ensure we recruit and retain the right people to operate our aerospace force in the future.
14. Achieve an unrivaled degree of innovation founded on integration and testing of new concepts, innovations, technologies, and experimentation.

TRANSFORMATIONAL MILITARY TECHNOLOGY

The following discussion provides a glimpse of some of the future capabilities the Air Force is pursuing that provide the near-order-of-magnitude increases in offensive capability which mark a true transformation.

Space and Cyberspace

The Air Force is leading the transformation that is occurring in the realms of space and cyberspace. Today, the Air Force manages space systems that provide the nation vigilance, communications, precision navigation, and timing signals that

The future offers near-real-time global-force application, which will give us the next generation of missile defense conducted from space-based platforms and the next generation of effects-based warfare – in one system

Force programs will also prove critical to evolving missile-defense systems with satellite constellations like the Space-Based Infrared System, and the Air Force will provide the critical command and control architecture to make such systems work.

The Air Force intends to move space far beyond those near-term missions, however. The future offers near-real-time global-force application, which will give us the next generation of missile defense conducted from space-based platforms and the next generation of effects-based warfare – in one system. What does near-real-time global-force application mean? It means that when the National Command Authorities (NCA) decide they want to achieve a particular effect, the Air Force can comply within minutes of the decision.

In order to provide that kind of option to the NCA, we need systems such as space-based lasers, combat aerospace vehicles, and space-maneuver and operations vehicles. Coupled with computer-network defense and computer-network attack, they will achieve effects at the speed of light. Again, the focus is not just on platforms but on the way we look at and integrate information technology so we can achieve dynamic battle-space control, integrating and rapidly fusing information from every appropriate source. We are not talking about days or weeks to plan for these operations, as we do today. We want a system that allows adaptive execution in minutes, with precision that can come only from *predictive* battle-space awareness. This type of system changes an entire mind-set – from one that calls for operating in small groups that affect geographically limited locales to one that calls for US and allied forces to think and operate across the entire globe (i.e., global network-centric warfare).

Precision Weaponry

The precision era that started so tenuously in Vietnam has now evolved to an all-weather capability. The remaining hurdles for precision-engagement weaponry are at hand and require aggressive stewardship to make them a reality. The Air Force is pursuing smaller and more precise munitions such as the small-diameter bomb, which will produce a dramatic increase in the lethality of each platform. The next generation of autonomous “seeking weapons” will meet the challenge of moving targets. Their small size and ability to seek, characterize, and precisely attack mobile targets will allow US aerospace power to reduce an enemy’s mechanized formations to dismounted infantry in hours. This has huge ramifications for how the joint force configures itself and fights. Finally, the Air Force is also pursuing directed-energy weapons – the ultimate in speed, lethality, and precision. The airborne

synchronize the Internet and enable such technologies as mobile phones and pagers. However, we are transforming our space force into a *spacecontrol* force – one that ultimately will provide persistent intelligence, surveillance, and reconnaissance around the globe. This is an especially important capability as our adversaries move to mobile platforms. Space-based radar exemplifies the kind of system that will allow us to do that. Air

...the Air Force is also pursuing directed-energy weapons – the ultimate in speed, lethality, and precision. The airborne laser constitutes a very important element of boost-phase missile defense, but the technology has even greater meaning for the future

laser constitutes a very important element of boost-phase missile defense, but the technology has even greater meaning for the future.

Stealthy Combat Platforms

Today, they have to contend only with a silver-bullet stealth force, but their problem magnifies geometrically if we transform into a primarily stealthy force. Stealth in numbers has strategic meaning

Four platforms will define the stealthy Air Force of 2020: the B-2, F-22, joint strike fighter, and unmanned combat air vehicle. In the air war over Serbia, the B-2 proved its ability to fly with global range and impunity, striking targets in any weather. The F-22 distills into one platform multiple capabilities that in the past required many separate aircraft to accomplish; such capabilities include air dominance, negation of enemy air defenses, precision attack, supercruise, advanced all-aspect stealth, and information integration. This constitutes another leap for increased capabilities with commensurately reduced requirements – similar to what the F-117 offered the nation during the Gulf War. The F-22 has capabilities that *no other aircraft* possesses, providing the United States with a true asymmetric advantage critical to maintaining its sole superpower status. In anti-access environments, the F-22 can operate for thousands of miles with

The F-22 has capabilities that no other aircraft possesses, providing the United States a true asymmetric advantage critical to maintaining its sole superpower status



tanker support; unlike legacy platforms, however, it will remain survivable and lethal when it reaches the combat zone. Similarly, while not as capable in all respects, the joint strike fighter can operate in the modern air-defense environment and will also help close the gap in military technology that strains our key alliances – again, stealth in numbers has strategic impact. Finally, the Air Force is aggressively pursuing a stealthy unmanned combat air vehicle as part of an advanced-technology demonstration. Applying lethal force from an uninhabited vehicle is risky, but it is also the wave of the future. That is why, together with the Defense Advanced Research Projects Agency, we are attempting to come to grips with those risks and, through experimentation, turn unmanned air vehicles into lethal systems. Stealthy airpower is a crucial, asymmetrical advantage that the United States cannot squander – we need to capitalize on that advantage to shape our future.

TRANSFORMATIONAL OPERATIONAL CONCEPTS

The Air Force has always been at the forefront of capitalizing on innovative technologies to transform the way the military fights – to leverage those technologies to achieve dramatic leaps in operational capability. The Air Force believes that the huge increases in capability shown over the last decade, as well as those desired for the coming decades, point to new ways of conducting military operations – not only for the Air Force, but also the entire joint force. New joint, operational concepts can provide integration templates for how the United States conducts military operations across the spectrum of conflict.

Effects-Based Operations (EBO)

Providing a perspective for planning, executing, and assessing military operations, EBO integrates other elements of national power to produce effects that compel desired political outcomes. Legacy methods focus on destroying targets, moving arrows on a map,

and waging wars of attrition. But EBO moves beyond those narrow, tactical viewpoints. Under this campaign-planning philosophy, the military planner uses superior knowledge to avoid attrition encounters, applying force at the right place and time to achieve specific operational and strategic effects. EBO promotes greater planning agility; it is also less plodding and more adaptive to the

achievement of specific effects. Although we have used elements of EBO in the past, through aggressive education and training in these operations, warriors from every service can achieve a more comprehensive framework for integrating all elements of the military – as

well as multinational and governmental agencies – into a coherent campaign philosophy.

...the military planner uses superior knowledge to avoid attrition encounters, applying force at the right place and time to achieve specific operational and strategic effects



Afghan delegates from a multi-ethnic council appointed to run the country until June 2002.

Global Reconnaissance Strike/Global Strike Task Force

Potential adversaries are taking advantage of various methods to deny US forces access to their centers of gravity. We must deny the enemy his antiaccess strategies through the use of stealthy, long-range platforms that can apply precise force with great rapidity. The Air Force has pioneered two operational concepts for crushing antiaccess threats. First, the concept of global reconnaissance strike offers a total joint-force solution for “breaking down the door” to allow follow-on joint operations. Second, the global strike task force outlines the Air Force’s key contribution to the joint antiaccess campaign, showing how the F-22/ B-2 team provides indispensable capability for holding the antiaccess systems of various adversaries at risk. These “rapid takedown” concepts constitute the core of our future operational employment against any adversary’s antiaccess strategy.

Rapid-Halt Operations

Our interest in global prosperity compels us to retain the capacity for rapidly halting adversary aggression that threatens the stability of the world community. Joint aerospace forces will constitute the key to this capability, which not only provides rapid, global ranging but also plays a huge role in deterring destabilizing behavior. Capitalizing on the precision, global reach, and knowledge provided by US aerospace power, this concept allows for the rapid employment of tailored joint forces to seize the initiative by isolating, incapacitating, and rapidly halting aggression. Using this concept, the Air Force has shown that it can rapidly “swing” forces from one theater to another, allowing fewer forces to conduct more than one major theater war simultaneously.

Our interest in global prosperity compels us to retain the capacity for rapidly halting adversary aggression that threatens the stability of the world community

Coercive Campaigns

Not all US military operations focus on bringing about an unconditional surrender or forcing a change of regime. In fact, only the most extreme historical cases sought these goals. In the post-Cold War environment, the United States is interested in controlling aberrant behavior and shaping hot spots, not annexing territory. This requires a different military-campaign mind-set – one that focuses on coercing the target nation through coordinated military and diplomatic means. In a coercive campaign, effects-based employment of appropriate elements of national power can modify an opponent’s behavior to comply with US strategic objectives.

The theme of all these operational concepts is that new capabilities enable new military approaches that can expand strategic options for both the United States and its allies, while



constricting those of our adversaries. The future demands new operational constructs that take advantage of US asymmetries and offer quicker, less bloody means of expanding global peace and prosperity.

TRANSFORMATIONAL ORGANIZATIONS

On the organizational side of the transformation journey, the EAF must evolve from the Cold War restrictions under which it still labors. The first 15-month cycle of AEF rotations taught us that reorganization alone would not fully realize the potential in the EAF concept. For example, the 10 AEFs are not equal in capability because the Cold War force was never constituted for that requirement. Furthermore, none of the AEFs is independently capable, and many of them have no standoff precision capability; must share stealthy platforms; and overstress certain low-density, high-demand assets.

To fully realize the EAF concept, we must transform it into a force consisting of 10 independently operating, equally capable AEFs. The theater commanders in chief must know that each AEF will deliver a known capacity for command and control, stealthy platforms, all-weather precision engagement, and other key functions. The EAF, however, includes more than our deployable assets. Space; intelligence, surveillance, and reconnaissance; national missile-defense architecture; our nuclear posture; intertheater airlift; recruiting/retention; and our excessive infrastructure all require attention. If the past 10 years are any indication, the future security environment requires a more balanced, fully capable EAF than we have today.

CONCLUSION

Aerospace forces operate as part of a joint, interagency, and coalition team – this understanding drives the Air Force's modernization program. Transformation is a difficult process, but the United States Air Force has linked its modernization plan to critical, future capabilities that will expand the nation's strategic options by offering order-of-magnitude increases in offensive combat capability. It's not just about greater capability – it's about capitalizing on this nation's key asymmetrical advantage to shape our world. In our position as the world's predominant economic and military power, we cannot afford to be reactive – we must invest in success.

What implications does transformation have for our traditional means of analysis and for the metrics we use in judging effectiveness? It is extremely important to adopt a capability-based approach when we make decisions about organization,

It's not just about greater capability – it's about capitalizing on this nation's key asymmetrical advantage to shape our world. In our position as the world's predominant economic and military power, we cannot afford to be reactive – we must invest in success



concepts, and system procurement. Cost per unit is often used today as a measure of merit in making such decisions. But a more accurate measure of merit that captures the real value or capability of a particular system is cost per target engaged or – better yet – cost per effect desired. In this fashion, one is led to consider all the elements required to achieve a specific effect. This is particularly important in dealing with stealthy systems. In many cases, although such systems may appear more expensive on a per-unit cost basis than less capable systems, they actually become significantly less expensive in terms of both lives and dollars when one considers all the elements required for alternatives to accomplish a similar effect.

The past decade has proven that aerospace power's inherent speed, range, and flexibility allowed it to make the transformational leap from the Cold War to the demands of the new world. We have a rare opportunity to shape our nation's future by capitalizing on those strengths. As history's only aerospace nation, we have a strategic obligation to fully realize and exploit the asymmetrical advantages of aerospace power. Recognizing the necessity of change, the Air Force is committed to transforming itself to best serve the interests of the United States.

DISCLAIMER

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Arthur 'Bomber' Harris



Lord Trenchard



A Practical Prophet?

Arthur Harris,
the Legacy of Lord Trenchard,
and the Question of 'Panacea' targeting



Arthur “Bomber” Harris was, and has remained, a figure of intense controversy. More than 50 years after he held command he still attracts opprobrium, even vilification. Yet unlike other controversial or “unpopular” air commanders such as Goering, Harris served on a winning side fighting what can only be regarded as a just and necessary war. As Commander-in-Chief of RAF Bomber Command from early 1942 until the end of the Second World War, Harris relentlessly sought to pursue a policy of area bombing German cities. Notwithstanding the generally acknowledged justice of the wider allied cause, this policy has often been seen as either immoral or unnecessary.¹ By their very nature these issues are difficult to resolve definitively, and so will continue to provoke dissention and even distress. But it is fair to say that Harris himself has been, or should be, cleared of the charge of being solely or directly responsible for the destruction of Germany. Although a proponent of area bombing, he did not invent the idea, which was already in place as with this policy actually took place at the political and grand strategic level, and were passed down to Harris either directly or, more usually, through instructions issued at the Chiefs-of-Staff level. The most basic consideration underpinning these decisions seems to have been a perceived need morally and materially to assist the Soviet Union at a time when an Invasion of western Europe was not considered feasible, and when the strategic bombing of Germany along precision lines was not yet possible.²

Harris can also now be seen in a more favourable light in regard to the question of the success of his policies. At one time it was customary to doubt whether the bombing of Germany contributed significantly to winning the war at all, and it was not uncommon to suggest that adherence to this policy had actually hindered the allied war effort.³ But recent scholarship has tended to emphasise both the damage done to the German war economy by bombing itself, and the massive diversion of German resources caused by the need to defend the homeland from aerial attack.⁴

...critics of Harris point out that at least by 1944 technical advances and changed circumstances had rendered precision bombing possible, even necessary

Harris is, however, still almost universally criticised on one point. He is seen as having persisted with area bombing for too long, in the process ignoring the validity of the idea of precision attacks against “bottleneck” targets. It is acknowledged that there might have been little alternative to area bombing by night in the earlier stages of the war. But critics of Harris point out that at least by 1944 technical advances and changed circumstances had rendered precision bombing possible, even necessary. And although he ultimately deferred to his superiors in these matters, there is no doubt that Harris did everything in his power to resist Bomber Command being diverted from what he regarded as its primary function, namely area bombing German industrial cities in order to destroy the enemy’s capacity and will to continue fighting. Although he actually argued against the extensive use of strategic bombing in support of the Normandy invasion, critics of Harris usually focus on his opposition to attacking what he referred to as “panacea” targets such as the German ball-bearing industry. Most notably, during the last winter of the war Harris famously but unsuccessfully attempted to dissuade his immediate superior, Charles Portal, Chief of Air Staff and a former Commander-in-Chief of Bomber Command, from insisting that priority be assigned to attacking the German oil industry, the destruction of which Portal believed offered the best available prospect of ending the war quickly.⁵

After the war it appeared that Portal had probably been correct. Harris’ position in this and other similar arguments on the question of “panacea” targets was therefore readily reduced to being seen as the mere product of a stubborn inflexibility. And while it has become possible to see Harris in a relatively favourable light regarding other issues, his late-war antipathy to precision targeting remains a banner around which anti-Harris sentiment still rallies. It therefore seems appropriate to examine Harris’ position on this point more closely. Accordingly, this piece of work will attempt to show why he clung so firmly to the idea of area bombing. The aim will be neither to argue that Harris was right after all, nor to follow the debates themselves in detail. It will, however, be suggested that his position was intelligible in itself and not without force. It will also be shown that Harris’ commitment to area bombing was underpinned by a doctrine, the validity of which was widely accepted. Again, the aim will not be to prove that this doctrine was correct. Nevertheless it will be seen to have provided Harris’ ideas with a sort of logical coherence that gave additional strength to the impressions formed in his otherwise essentially empirical mind. Conversely, and more importantly, Harris’ dynamic practicality will be shown to have imbued this doctrine with potentialities that

it otherwise lacked. Because he did possess a natural practical bent and a concomitant distrust of abstract speculation, it is necessary to include a brief survey of Harris' earlier career with a view to formulating what may be taken to be his own bombing doctrine. The policies of Bomber Command before he took charge also need to be touched on. Firstly, however, a brief discussion of the ideas and influence of Hugh Trenchard, leader of the RAF from 1919, is required in order to appreciate the background doctrinal imperatives that informed Harris' thinking.

Although Trenchard had commanded the RFC from 1915, he only became associated with strategic bombing in any direct sense in 1918 as head of the Independent Force created to strike back at Germany in retaliation for her long-range attacks against England. Trenchard was already committed to the concept of the intrinsically offensive nature of air power and, like many others, he came to feel that enemy (civilian) morale could easily be broken by strategic bombing. At the time there seemed several reasons for such a belief, not least the fact that German air raids, although hardly bringing about social collapse, had caused considerable distress among British civilians. The defeat of Germany also came to be understood as having been precipitated by a social breakdown. Moreover, after the war bomb-damage inspection teams concluded that the overall effect of the strategic bombing of Germany had been greater than the actual damage inflicted seemed to suggest. Trenchard's views on these matters hardened further in the early 1920s in the course of the "Battle of Whitehall" when he sought to protect the existence of the RAF amid a general debate being waged concerning the best means of defending Britain and the empire in any future conflict.⁶ Throughout this period he stressed that, while armies and navies were now at the mercy of aircraft, the best form of defence would be an assault on an enemy's homeland by means of a strategic aerial offensive which would cause industrial paralysis and, especially, destroy the will to fight on. While no major conflict occurred during this period, Trenchard was able to put some of his beliefs into practice, albeit in a very attenuated form, by what is referred to as

...German air raids, although hardly bringing about social collapse, had caused considerable distress among British civilians

"substitution." This procedure was based on the idea that the air force, that is to say the implied and real threat of aerial attack, could control the empire more cheaply and effectively than the army and the navy.

Trenchard's theory of air power may therefore be seen as having consisted of three basic tenets: the necessity of offensive action; the potential vulnerability of civilian morale to air attack and the consequent likelihood of precipitating social collapse by bombing; and "substitution" in the wider sense of believing that the air force could now virtually replace the army and navy, even in a major conflict. Trenchard's ideas are particularly important because from the mid 1920s, with the existence of the RAF now secure, they began to be converted into official doctrine, being propagated through the RAF Staff College and in the Air Ministry.⁷ Significantly, while perhaps not being inconsistent with the idea of precision bombing in any logical sense, Trenchard's line and style of thought basically encouraged area attacks.⁸ It should perhaps be added in fairness that during the period when Trenchard's ideas were forming, precision bombing as understood by later generations barely existed as a concept, let alone as

a practical possibility. Whatever the case, by the late 1920s the official policy of the RAF seems to have been that even when selected industrial targets were to be attacked, relatively near misses would be more than acceptable because nearby civilians would still be demoralised as a result.⁹

Some voices of dissent were, however, heard during this period. John Slessor, for one, seems to have felt that Trenchard's emphasis on morale was excessive. Slessor did acknowledge that bombing might well have a great effect on civilian morale in certain circumstances,¹⁰ but he regarded the issue as something of an imponderable, focussing instead on restricting industrial output and strangling supply to the enemy's armed forces. Slessor therefore seems to have been less extreme than Trenchard in all areas as his ideas also carry the implication that air power alone would not be sufficient to win a war.¹¹ Portal, too, while something of a protégé of Trenchard, thought that the absolute priority the latter assigned to bombers over fighter aircraft was wrong.¹² Too much should not be made of such dissent as it existed at the time, but it does arguably represent the beginnings of an undercurrent of thinking that would from time to time seek to moderate the manifest extremity of Trenchard's views, without necessarily challenging their hegemonic status.¹³

Unlike Portal and Slessor, Arthur Harris did not oppose any of Trenchard's views. Indeed, important phases of Harris' interwar career can be seen virtually as concrete expressions of Trenchard's thinking. Most notably, having emerged from The Great War with considerable experience in flying both fighters and bombers at night, and after a short posting to India, Harris took command of a squadron in Mesopotamia in 1922, serving there for two and a half years. This squadron had been moved from Egypt specifically to take part in what was then called the "RAF control scheme," that is to say operations involving Trenchard's concept of "substitution." Harris displayed enormous energy in this command, converting his squadron from a largely transportation role to an all-out bomber force, and personally designing and installing bomb-aiming devices. He also trained his squadron in night operations, believing that bombing by night should entail a greatly increased psychological effect.¹⁴ Technical and operational innovation, the idea of bombing by night, and an emphasis on training became characteristic themes in Harris'



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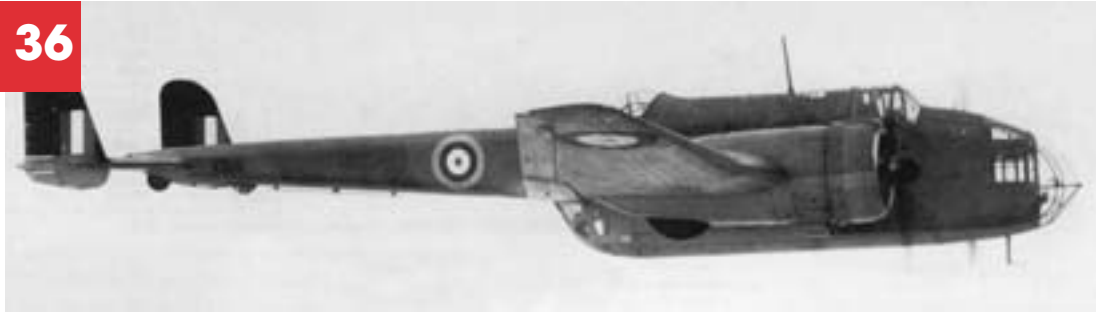
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commands throughout the interwar period. For example, in 1926, when he was commanding a “heavy bomber” squadron in England, Harris’ desire to experiment with training in formation flying at night required the permission of Trenchard himself, who accordingly sanctioned an amendment to the Flight Training Manual.¹⁵

Although dominated by Trenchard’s ideas in the period between the wars, there is little doubt that the RAF was so unprepared for the Second World War that Bomber Command was in no position to put these ideas into practice. It is customary to attribute the RAF’s unreadiness for a major conflict to interwar cost-cutting and a wishful pacifism at government level, both tendencies being epitomised in the notorious Ten-Year Rule.¹⁶ Some have gone further and actually blamed the extent of the hegemony of Trenchardist thinking for Bomber Command’s lack of preparation for conflict and for its operational failures in the early stages of the war.¹⁷ So confident were the RAF and the Air Staff that a swift and easy victory would be brought about by air power, the argument runs, that little or nothing was done about it by way of either tactical and technical development, or meaningful training. Although this line of thought does seem rather extreme, it is perhaps fair to say that between the wars Bomber Command did begin to exhibit signs of ossification in respect of the relationship between doctrine and practice. If this was in fact the case, Harris stands out as an exception to the rule by not only continuing to treat Trenchard’s ideas as viable, but also striving to be in a position to put them into practice.¹⁸ Moreover, for one who achieved such high rank Harris held surprisingly few staff positions. Yet it is significant that when he did so, notably in the mid 1930s as Deputy Director Plans, he worked vigorously for the creation of a long-range, heavy-bomber force, in the process arguing against maintaining any commitment to light and medium bombers.¹⁹ Harris’ time away from active command may therefore be seen as having involved the pursuit of Trenchard’s vision. In other words, the interwar years not only reveal Harris to have been a committed Trenchardist, but also show that he was remarkable in having possessed both the desire and the ability to make this vision a reality.

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RAF Hampden of the pre-war years

During the time Harris served as Deputy Director Plans, the Air Staff was in fact beginning to appreciate that the RAF was unprepared for the war with Germany...

aircraft production, and the creation and distribution of electrical power.²¹ Nevertheless, and perhaps not surprisingly in the circumstances, the proposal that ultimately commanded the most attention was, in the short term at least, the most nebulous and indecisive. Importantly, this proposal suggested that an independent strategic bomber force could eventually become the means of victory if it were initially held largely in reserve, allowing it to gather sufficient strength for the task.²² While indecision in all of these areas, and doubts about the effectiveness of Bomber Command would persist well after hostilities had begun, an essentially Trenchardist vision of victory through air power still persisted, despite not being considered feasible for the moment.

From late 1940 this idea of a massive and war-winning area bombardment of Germany began to gather momentum. Although it is interesting that Trenchard himself, emerging from retirement but hardly from obscurity, had become vocal again,²³ this change in thinking can be associated with new perceptions at the highest political levels. Churchill in particular now exhibited what has been referred to as an “uncritical enthusiasm” for bombing.²⁴ Portal, newly created Chief of Air Staff, now shared Churchill’s enthusiasm for area bombing,²⁵ albeit without wholly abandoning the idea of pinpointing vital aspects of the German war industry such as oil and aircraft production.²⁶ In November 1940 Churchill told Portal that Germany should be subjected to heavier bombardment, while a year later Portal insisted that more bombers would be needed if the desired effects on German morale were to be achieved.²⁷ By late 1941, in the face of embarrassing operational failures,

During the time Harris served as Deputy Director Plans, the Air Staff was in fact beginning to appreciate that the RAF was unprepared for the war with Germany that increasingly seemed imminent. The years just before the outbreak of war were marked by a flurry of activity involving rearmament programs, policy evaluations, and calls for proposals concerning how air power might best be used in a strategic sense.²⁰

Interestingly, this period of flux and uncertainty marked the re-emergence of the relatively subtle approaches of Slessor and, to a lesser extent at this stage, Portal to strategic bombing. And as war loomed closer this tendency towards subtlety was amplified to some degree by political antipathy towards the sort of bombing that might provoke reprisals. Most of the many bombing proposals that emerged during this period involved more or less precision attacks on aspects of German industry, with Slessor himself seeming to favour targeting oil,

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Churchill began to doubt the feasibility of achieving victory through bombing.²⁸ He would continue to blow hot and cold on the matter, becoming dispirited when bombing failed to fulfil his expectations. For the moment, however, Churchill came to feel that a fresh attempt was needed, with pressure now building to support the Russians. Accordingly, it was decided that a new bombing offensive should be undertaken in early 1942, consisting of heavy blows and largely incendiary attacks with a view to undermining German morale.²⁹ Feeling that a new operational approach would also be needed, Portal specifically chose Harris for the job, promoting him to Commander-in-Chief of Bomber Command.³⁰

What doctrines and beliefs about air power would underpin the new Commander-in-Chief's decisions? Harris possessed a practical person's antipathy to philosophising about anything at all, let alone about strategic bombing. His post-war memoirs, for example, are virtually free of air-power theory. In these memoirs, however, Harris does at one stage quote directly from the seminal Smuts Report of 1917:

*...there is absolutely no limit to the scale of [air power's] future independent war use. And the day may not be far off when aerial operations with their devastation of enemy lands and destruction of industrial and populous centres on a vast scale may become the principal operations of war, to which the older forms of military and naval operations may well become secondary and subservient.*³¹

Smuts' vision had clearly captivated Harris. And it is important to note that Smuts was speaking in terms of the potential, rather than the reality, of air power. Smuts' vision also contained some of the essential elements of Trenchard's doctrine, and it may be regarded as having given rise to the conceptual, operational, and even institutional framework within which Trenchard's own ideas would develop.

Moreover, despite his dislike of theoretical discussion, the position and high rank Harris achieved in early 1942 meant that he was in fact required to commit his thoughts on air power to writing from time to time. His correspondence with Churchill is particularly significant here because in it Harris elaborates his position in a very general way, thereby revealing the range and depth of Trenchard's influence on his thinking.³² The central theme of Harris' letters is the war-winning capability of a

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properly handled strategic bombing offensive. His precise position varies from claiming that no invasion of Germany or of anywhere else in Europe would even be necessary, to suggesting that bombing could provide a “walk-in” for allied ground forces whose role might therefore amount to little more than policing and occupation. Whatever the case, Harris’ point is that a bombing offensive offered not only the sole means available for victory, but also an alternative, as he put it, to “vastly protracted and avoidable land and sea campaigns.”³³ To achieve these ends Harris envisaged an area-bombing assault which would “raze substantially to the ground 30 or 40 of the principal German cities,” and which would, he believed, fatally affect “German morale and German production.”³⁴

While the parallels with Trenchard’s ideas are obvious – Harris’ own stated position virtually consisting of doctrinaire Trenchardism as applicable to the then current circumstances – the essentially practical nature of Harris’ approach must also be stressed.³⁵ In 1942 the question had ceased to be whether a Trenchardist area assault against Germany was desirable. Almost everyone favoured the idea at that stage. The question was whether it was possible. Harris’ approach to the problem was based on a stunning appreciation of the importance of the principle of the concentration of one’s forces. And it is significant that Harris’ use of this principle actually departed from Trenchard’s *operational* approach as leader of the Independent Force in the Great War in as much as the latter had believed that the maximum effect on enemy morale would be achieved by bombing as many different targets as possible. Harris sought to place the greatest possible bomber force over a given target, not only in terms of raw numbers, but also, and perhaps more importantly, within as brief a period of time as possible.³⁶ Maximum damage would therefore be achieved along with a saturation of the enemy defences, hopefully leading to proportionally lower losses on the part of the attackers. Nevertheless the effort required to put these ideas into practice would be enormous, involving a massive investment in training – the continuation of an emphasis apparent throughout Harris’ earlier career – and the harnessing of new technologies as they became available.

Harris sought to place the greatest possible bomber force over a given target, not only in terms of raw numbers, but also, and perhaps more importantly, within as brief a period of time...

As his methods began to bear fruit, Harris received praise and encouragement. In particular, the thousand-bomber attack on Cologne in late May 1942 was rapturously welcomed on both sides of the Atlantic and in Russia. But Harris regarded this period as a preliminary phase of operations, the Cologne raid really being a demonstration of what could be achieved if a continued build-up of bomber strength was maintained in the face of what he took to be importunate pressure, particularly on the part of Coastal Command, to divert resources to other theatres of war. By mid 1943, while still planning for the future, Harris felt sufficiently confident to begin his task in something approaching earnest, embarking on the “(First) Battle of the Ruhr,” and an assault on Berlin later that year. At this point he was ordered to prepare the way for and to support the landings in Normandy, which he did so with a degree of success that surprised no one more than himself. In late 1944, with Harris worried

that the “Overlord diversion” had allowed the German home front a period of six-months or more in which to recover, and as he prepared to resume his assault on the Ruhr, the question of precision or “panacea” targeting resurfaced or, rather, erupted.

The forceful and even exasperated nature of Harris’ responses to the demands of those in favour of precision bombing from this time can therefore be attributed in part to the fact that he felt himself again thwarted from pursuing a course of action he believed in and had been preparing for over a period literally of years. He drew attention, moreover, to a recent history of both indecision as to what the correct “panacea” target was, and of disastrous operational failures when attacking them, notably the American raids on Schweinfurt. In addition, he was able reasonably to argue that, although having received a mass of contradictory orders and suggestions, in carrying out area attacks focussing on German industry in general and on enemy morale, he was complying with what seemed his most authoritative directives, namely the *21 January 1943 Combined Chiefs of Staff Directive* which emanated from the Casablanca Conference, and the *Pointblank Directive* of 10 June 1943.³⁷ Indeed, in the face of this conflict and confusion, his dogged pursuit of a single line of policy seems understandable, and perhaps even praiseworthy. He also pointed out, finally, that many of the precision targets he was being urged to attack were difficult enough to find, let alone to destroy.³⁸

But is necessary to acknowledge that these arguments, and the debate itself, were the products of deeper forces. Various background factors, moreover, seem to have played a part in bringing these forces to the surface. At this stage in the war emphasis had arguably shifted towards the question of how the struggle could be brought to an end and, within this, how the present relatively advantageous situation might best be exploited. The example of American strategic bombing was perhaps a factor here as well, the Americans having always, at least in theory, been committed to the idea of precision bombing. Some of the guesswork involved in proposals for targeting also appeared to have been eliminated on account of a streamlining of the means of gathering and passing on relevant information.

On an even more fundamental level, however, the debate over “panacea” targeting that came to the surface in this context was a manifestation of the tension between two approaches to strategic bombing: the impulse towards subtlety and precision exemplified by Slessor and, increasingly, by Portal; and a generally dominant Trenchardism. While this tension had existed in the RAF for some time, perhaps for decades, anti-Trenchardist thinking had not really been visible since the confusion and uncertainty of the late 1930s and early war period. Harris possessed both a dispositional, and a Trenchardist antipathy to this line of thought. This antipathy had been strengthened in the course of his own essentially practical refinements to Trenchard’s doctrine, and it underpinned his narrower (practical) arguments against “panacea” targeting.

Harris strikes one as dynamic and effective, far exceeding Trenchard himself who, aside from his role as the “Father of the RAF,” should really be seen more as an air-power visionary...

In terms of his abstract doctrine and in his writings, then, Harris appears as an interesting enough but basically unreconstructed Trenchardist. In practice, however, Harris strikes one as dynamic and effective, far exceeding Trenchard himself who, aside from his role as the “Father of the RAF,” should really be seen more as an air-power visionary or prophet. Trenchard wrongly thought that his ideas were, or could readily become, a reality, and many agreed. In fact he left an exceedingly problematical legacy, and it is difficult to imagine anyone except Harris being able to cope – let alone thriving – having been given the burden that this legacy was becoming. We now may feel that Harris’ job had been completed by 1944. But at the time it was far from clear that this was the case. And although he ultimately followed orders in this as in all matters, we cannot blame Harris for exhibiting a characteristically fierce determination to persist with a policy which he had been specifically chosen to implement, which he had been encouraged to pursue, and which he himself had rendered possible, all the while knowing full well, one suspects, that he would be condemned by posterity.



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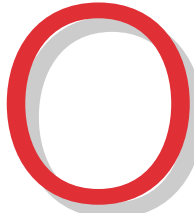
- 1 See Sebastian Cox's introduction to Arthur T. Harris, *Despatch on War Operations 23rd February 1942 to 8th May 1945*, HMSO, London, 1995, esp. p. ix.
- 2 Richard Overy, *Why the Allies Won*, London, 1995, pp. 102ff.
- 3 For some examples of this sort of thinking see Richard Overy, "World War II: The Bombing of Germany," in Alan Stephens (ed.), *The War in the Air 1914-1994*, Canberra, 1994, pp. 113-140, esp. pp. 113f. + fns. Denis Richards, *Portal of Hungerford*, London, 1977, p. 299 also provides an interesting broad-brush summary of various criticisms of the bombing of Germany.
- 4 Landmark works in this reappraisal are Overy, *Why the Allies Won*, esp. pp. 101-133, and Alfred C. Mierzejewski, *The Collapse of the German War Economy 1944-1945: Allied Air Power and the German National Railway*, Chapel Hill and London, 1988.
- 5 Criticism of Harris' antipathy to precision bombing has ranged from the relatively sober view of Webster and Frankland, the official historians, to shriller attacks such as HR Allen, *The Legacy of Lord Trenchard*, London, 1972. Allen (pp. 158-173) discusses the oil debate in the context of "the rape of Dresden." For the oil debate itself see Henry Probert, *Bomber Harris. His Life and Times*, London, 2001, pp. 306-315, Charles Webster and Noble Frankland, *The Strategic Air Offensive Against Germany*, HMSO, London, 1961, esp. Vol. 3, pp. 75-78, and Denis Richards, *op. cit.*, pp. 317-332, which provides a nuanced account both of Portal's position in the debate, and of his relationship with Harris at the time. Probert's recent book (pp. 332ff., 382-5) also contains some interesting remarks on the view taken by the official historians towards Harris in general.
- 6 Andrew Boyle, *Trenchard: Man of Vision*, London, 1962, pp. 468-473.
- 7 Phillip S. Meilinger, "Trenchard, Slessor, and Royal Air Force Doctrine before World War II," in Phillip S. Mellinger (ed.), *The Paths of Heaven: the Evolution of Airpower Theory*, AUP, Maxwell AFB, 1997, pp. 41-78, esp. pp. 54f.
- 8 This connection between Trenchard's views and (later) area bombing is noted in David S. Fadok, "John Boyd and John Warden: Airpower's Quest for Strategic Paralysis," in Meilinger, *op. cit.*, pp. 359-400, esp. pp. 385 f. See also Overy, *Why the Allies Won*, p. 106.
- 9 Horst Boog, "Harris – A German View," in Harris, *op. cit.*, pp. xxxvi-xlvii, esp. p. xli. Boog discusses the Royal Air Force Manual of 1928/1940. See also Trenchard's "Memorandum by the Chief of Air Staff for the Chiefs of Staff Sub-Committee on the War Object of an Air Force, 2nd May, 1928," in Webster and Frankland, *op. cit.*, Vol. IV, pp. 71-76.
- 10 In 1915 Slessor, a young pilot-officer in the RFC, had been menaced in the London's East End by victims of Zeppelin attacks. John Slessor, *The Central Blue*, London, 1956, pp. 14f.
- 11 Meilinger, "Trenchard, Slessor and RAF Doctrine," and JC Slessor, *Air Power and Armies*, London, 1936, esp. pp. 65-69.
- 12 Neville Jones, *The Beginnings of Strategic Air Power. A History of the British Bomber Force 1923-1939*, London, 1987, pp. 28f. Cf. Richards, *op. cit.*, pp. 88-91. It is tempting to suggest a parallel between the relatively subtle approaches that Slessor and Portal advanced and the search for sophisticated alternatives to conventional warfare by interwar military theorists such as Fuller and Liddell Hart. See Meilinger, *op. cit.*, p. 62 for some remarks that could be taken to support such a line of thought.
- 13 Interestingly, Tami Davis Biddle regards a paper written in 1917 by Major Lord Tiverton, a future Air Staff planner, as propounding an embryonic doctrine of precision targeting. Biddle acknowledges, however, that a year later Tiverton himself had become an advocate of morale or area bombing, now toying with the idea of what would become known as "de-housing." See Tami Davis Biddle, "British and American Approaches to Strategic Bombing: Their Origins and Implementation in the World War II Combined Bombing Offensive," *Journal of Strategic Studies*, Vol. 18, No. 1, pp. 91-144, esp. p. 93.
- 14 Dudley Seward, *"Bomber" Harris*, London, 1984, pp. 27-31. Harris himself also regards the operations he was involved with in India as 'primitive essay[s] in the "air control" we were later to use in Irak [sic.]' Arthur Harris, *Bomber Offensive*, London, 1947, p. 21. In 1938, as Air Officer Commanding Palestine and Transjordan, Harris used a similar substitution-style approach, referred to at that time as the "air-pin." Seward, p. 63.
- 15 Jones, *op. cit.*, p. 55.
- 16 For example *ibid.*, p. 172.

- 17 Scot Robertson, *The Development of RAF Strategic Bombing Doctrine, 1919-1939*, Westport & London, 1995, esp. pp. 158-161. See also Allen, *op. cit.*, esp. p.85.
- 18 Robertson (p. 161) does cite Harris' efforts in Iraq as an exception to the perceived general pattern, but he goes on to claim that "following that posting [Harris] seems to have neglected what is now called operational research."
- 19 Seward, pp. 46f; Slessor, *The Central Blue*, p. 174.
- 20 Jones, pp. 126-167.
- 21 *Ibid.*, p. 158; Slessor, *The Central Blue*, p. 246.
- 22 Plan "WA 5." Jones, pp. 131f. See also Slessor, *The Central Blue*, pp. 206f., and Probert, *op. cit.*, p. 98 + fn. for the development of this idea of the conservation of the bomber force.
- 23 For an overview of Trenchard's public and private pronouncements during the war see Richards, pp. 146, and esp. 223-229. In May 1940 Trenchard wrote to Portal, then Commander-in-Chief of Bomber Command, and rather bizarrely opined that if it had been properly used, bombing "probably [could] have ended the war by now." Trenchard's highest profile missive from this period, "Memorandum by Marshal of the Royal Air Force Lord Trenchard on the Present War Situation Mainly as it relates to Air, 19th May 1941," which Churchill circulated to the Chiefs of Staff, is found in Webster and Frankland, Vol. IV, pp. 194-197.
- 24 Overy, "The Bombing of Germany," p. 103.
- 25 Richards, p. 164.
- 26 *Ibid.*, pp. 300f. In the winter of 1940/1941 Portal wanted to target German morale by area attacks when the absence of moonlight made "precision" bombing impossible.
- 27 *Ibid.*, pp. 187ff.
- 28 *Ibid.*, p. 303.
- 29 *Ibid.*, p. 305, and Overy, "The Bombing of Germany," p. 116. The directive for this new offensive issued by the Air Staff on 14th February 1942 is found in Webster and Frankland, Vol. IV, pp. 143-148. Probert (p. 132) points out that this directive marked the end of the idea of the conservation of the bomber force for future operations.
- 30 Richards, p. 305.
- 31 Harris, *Bomber Offensive*, p. 17.
- 32 Prominent examples of this correspondence are quoted and discussed in Seward, pp. 148-170 and Probert pp. 140ff. Probert does not seem to attach any special significance to this exchange and concludes that it reveals Harris at "very far from his best."
- 33 Seward, pp. 160f. See also Harris, *Bomber Offensive*, p. 17.
- 34 Seward, p. 169. This letter was written on 3 September 1942.
- 35 A contrast between Harris and Trenchard is apparent in their respective analyses of World War One. While Trenchard felt that the "evidence" of the Great War verified his theories, Harris believed that the submarine had been the outstanding strategic weapon of that conflict, bombing having (merely) shown that it had the potential to be absolutely decisive in the future. Here Harris reveals himself as both imaginative and practical. *Bomber Offensive*, pp. 17, 279.
- 36 *Bomber Offensive*, pp. 70-89, esp. p. 83. Harris' exhortations to his aircrew to attain concentration over the target were frequent. Examples pertaining to the raids on Essen and, with particular emphasis, Cologne in early 1942 can be seen in Probert, pp. 133, 185.
- 37 Both documents, if not considered internally contradictory, are at least sufficiently ambiguous to be susceptible to various interpretations. Both, however, do seem at times to encourage the sort of attacks Harris was pressing for. A ludicrous state of affairs had been reached in early 1944 when NH Bottomley, DCAS, in the course of pressing Harris to attack Schweinfurt by night, urged him to "adhere to the spirit" of the *Pointblank* Directive. Webster and Frankland, Vol. IV, pp. 153f., 158ff., 160f. It should perhaps be added in fairness that, as Probert (p. 252) points out, Harris himself had been consulted in the course of drafting the later proposal. His suggestion to amend the wording – "slightly but significantly" according to Probert – so that it included direct reference to the Trenchardist goal of undermining German morale was accepted.
- 38 An interesting and not unsympathetic account of Harris' arguments against "panacea" targeting is found in Cox, *op. cit.*, passim, esp. pp. xv, xixff.



The Big Question-

Will the
Missile Defence System
enhance
US national security?



On 1 September 2000, President Clinton announced his decision not to authorize deployment of a national missile defence (NMD) system: 'I simply cannot conclude, with the information that I have available today, that we have enough confidence in the technology, and the operational effectiveness of the entire NMD system, to move forward to deployment.' His decision followed close on the heels of the failure of the third interception test of the NMD initial capability. NATO Secretary-General Lord Robertson commented, 'The decision ... to continue testing and development of a limited national missile defence system, while reserving judgement on eventual deployment, appears to be a prudent course of action that balances the many factors involved in this issue.'¹

In a briefing later that day, National Security Advisor, Samuel R. Berger, reiterated the four criteria against which the Clinton Administration had made its decision: the nature of the threat; the cost; the technical feasibility of a system and the overall impact on national security. Crucially, Berger went on to say, 'The fourth criterion, national security considerations, including arms control, in effect addresses the largest question – whether NMD in the context of the overall security environment will enhance our overall security or diminish it.'

This paper examines that pivotal question in the light of the decision to defer deployment of NMD. It will examine three key elements: what can be deduced about the relevance of ballistic missile defences from experience during the Cold War; how have current NMD proposals developed in parallel with US national security strategy; and whether deployment of a national ballistic missile defence system would represent a coherent and positive contribution to that national security strategy. It will not embark on an examination of either the technology involved in missile defence or the ballistic missile threat it is intended to

meet. Neither of these is relevant, as it can be assumed that some form of defence will be technically feasible, and that increasingly sophisticated ballistic missiles will continue to proliferate, at least for the foreseeable future.

...1956 saw the Soviets commence construction of a test site in Kazakhstan, while the first US Anti-Ballistic Missile (ABM) project, Nike-Zeus, formed in the same year

One of the remarkable features of the debate on ballistic missile defence (BMD) is its durability. Trends over the past 40 years are important in examining how ballistic missile defences have previously been developed, justified and related to the prevailing security environment. These experiences hold some important lessons for current developments in NMD.

The desire to defend against ballistic missiles is a natural reaction and one not confined historically to the US or Soviet Union. During debate on the 1957 Sandys Defence Review, one British MP pleaded for greater attention to such protection, 'Has not considerable work been done already on the possibility of using guided missiles with atomic warheads in a defensive role to destroy attacking missiles? During the next decade this may come, utterly fantastic as such a thing seems today.'² Work was indeed well underway; 1956 saw the Soviets commence construction of a test site in Kazakhstan,³ while the first US Anti-Ballistic Missile (ABM) project, Nike-Zeus, formed in the same year.⁴

In 1959 Eisenhower blocked deployment of Nike-Zeus on the grounds of technical inadequacy. Deployment was blocked again in April 1961. Robert McNamara provided testimony to the Senate Armed Services Committee on Nike-Zeus deployment that would have served well in Clinton's recent NMD announcement, 'There is still considerable uncertainty as to its technical feasibility and, even if successfully developed, there are many serious operating problems yet to be solved.'⁵ But research and development on ABM continued, evolving into the Nike-X system.

In September 1967, Johnson decided to press ahead with a 'thin' implementation of Nike-X to protect US cities, a system to be known as Sentinel. The logic for deployment of Sentinel was virtually indistinguishable from current NMD thinking: the primary justification was the need to counter an emerging but limited threat (in this case the Chinese ICBM force), while the associated capability against accidental or rogue ICBM attack was an additional benefit. Sentinel's impact on strategic deterrence was predicted to be limited. McNamara had consistently argued that the USSR would counter such a deployment by increasing force levels and the result would be 'to increase greatly our respective defence expenditures, without any real gain in security for either side.'⁶ This expectation presaged neatly the idea of forcing debilitating economic penalties on an opponent by pursuing such defences and its effects were later to become apparent as Reagan pursued the Strategic Defence Initiative.⁷

...McNamara, who harboured considerable doubts about the system, was forced into a deployment decision by substantial pressure from an alliance of military, industry and Congressional groups...

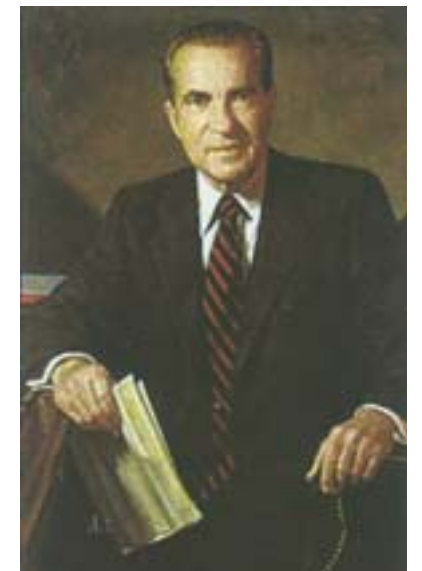
Why the US should have been concerned to protect against a limited attack at this time is by no means obvious. Clearly there was a desire to maintain equivalence with the Soviets in the ABM field, but it is difficult to imagine that the US would have achieved much by actually deploying a system that did little to counter the Soviet threat. Somewhat more convincing is the argument that McNamara, who harboured considerable doubts about the system, was forced into a deployment decision by substantial pressure from an alliance of military, industry and Congressional groups; in effect the military-industrial complex.⁸ Current proposals for NMD constitute a relatively small percentage of the US defence budget but it would be wrong to underestimate the continuing influence of this lobby in ensuring its continuation. As Greenwood has observed, 'Large organisations have been created that owe their existence solely to their ability to invent or design new weapons and sell them to political decision makers. These organisations include not only the development commands of the services but also some of the largest of the nation's corporations who together employ millions of workers and represent a powerful political force.'⁹ The latest NMD contract, worth \$6bn, was awarded to the Boeing Company, Space and Communications Group, the prime contractor and lead system integrator, on 22 December 2000. If all options are exercised the contract has a potential value of \$13bn.¹⁰ Even though this represents only 1% of the defence budget over the next 6 years, NMD stakes remain high.

On inheriting the Sentinel issue, Nixon reaffirmed the deployment decision but completely changed the intent as well as the name of the proposed system. Now re-christened Safeguard, the system was intended to preserve a US second-strike capability by protecting ICBM sites against pre-emptive attack. Nixon would like to have deployed a more capable system but the technical realities of the situation were summed up in his March 1969 deployment announcement;

Although every instinct motivates me to provide the American people with complete protection against a major nuclear attack, it is not now within our power to do so. The heaviest defence system we considered, one designed to protect our major cities, still could not prevent a catastrophic level of US fatalities from a deliberate all-out Soviet attack.¹¹

Nixon's reference to an instinctive desire to protect the US population highlights another enduring theme in the justification of ABM defences, popular demand, one that is of less importance than successive generations of politicians have implied

Nixon's reference to an instinctive desire to protect the US population highlights another enduring theme in the justification of ABM defences: popular demand, one that is of less importance than successive generations of politicians have implied. At the time of Nixon's announcement, a Gallup poll showed only 25% were in favour of installing Safeguard, while 15% were against and 60% had no opinion on the matter.¹² Latest polls show opinion evenly divided on NMD. A Gallup Poll in February 2001 showed 44% in favour of development, 20% opposed and 36% undecided, while the previous April an ABC poll found opponents in the ascendancy by a margin of 53% to



44%.¹³ Of course, opinion polls will show variation in response depending on the nature of the question asked. Another recent poll for CBS News and the New York Times initially found a staggering 58% of respondents thought the US already had a missile defence system.¹⁴ Once people understood that this was not the case, and that there were doubts over the technical feasibility of such a system, the approval rating dropped to 25%.¹⁵ Public opinion has never been sufficiently strong to drive NMD deployment by itself but neither is it ever likely to be the cause of NMD's demise.

At the time of Nixon's Safeguard announcement, construction of an ABM system around Moscow was already underway

At the time of Nixon's Safeguard announcement, construction of an ABM system around Moscow was already underway. Work on the A35 (or ABM-1) system had begun in 1966¹⁶ but by 1969 it was apparent that it would be inadequate to provide protection against anything but a limited Chinese strike.¹⁷ Despite modernisation over the next 30 years, the Russian system remains, at best, capable of countering only the same limited threat. In both East and West, a pattern of lagging technology struggling to find a justification in an evolving strategic environment was firmly established.

Originally configured for area defence of US cities, Safeguard was now tasked with the point defence of Minuteman ICBM silos, for which it was less than ideally suited. Even before Safeguard's deployment the US Army had realised this weakness and was planning to reduce the system's readiness while developing a more suitable successor, the Site Defense system.¹⁸ Against the background of détente, the ABM Treaty, Soviet deployment of Multiple Independent Re-entry Vehicles (MIRVs) and Safeguard's technical inadequacy, Congress could stomach no more spending and the House voted to deactivate Safeguard on 2 October 1975, the day after it had been declared operational.¹⁹

Both the US and the Soviet Union were already fully aware of the limitations of ABM systems and their limited impact in the event of nuclear conflict. These systems had become little more than bargaining counters during the SALT 1 talks. Eventually, the talks produced the 1972 ABM Treaty, the only durable and legally binding instrument of SALT 1.²⁰ This Treaty continues to limit signatories to a single ABM system of no more than 100 interceptors and incapable of defending their entire territory.

In the late 1970's attention shifted to the Soviet first strike advantage that was perceived to be developing with their deployment of fourth generation ICBMs.²¹ Concurrently, the upgrade to US land based ICBMs, the MX program, had become mired in the issue of survivability. This gave the US ballistic missile defence research and development program the oxygen it needed to stay alive, principally in developing the Low Altitude Defense System intended to protect MX missile sites. Safeguard had fallen victim to a lack of consensus in Congress that left it vulnerable to political attack²² but now the deterioration of détente re-established the conditions for consideration of BMD.

This period illustrates another recurring theme in missile defence. Changes in the strategic environment naturally drive reassessment of US strategic defences. Successive administrations have hedged their bets by never completely abandoning

ballistic missile defence research. Thus each time such a change has occurred a new system has quickly been proposed which fulfils some essential function in the new strategic climate.

The Strategic Defence Initiative (SDI) was unveiled on 23 March 1983 and was justified by the need to 'save lives rather than to avenge them',²³ which places it in the same category as current NMD proposals and Sentinel. In fact, the continuing failure to produce an adequate solution to the MX survivability problem also played a crucial part in convincing Reagan that a radical alternative strategy had to be pursued in order to put the Soviets on the back foot.²⁴ A key feature of the initial success of SDI was the wide acceptance it received in the US, a consensus absent in contemporary debate. However, the proposals received an almost uniformly negative reception in Europe, where allies had not been consulted. The arguments levelled against SDI were almost identical to those fielded against NMD today.²⁵ In the US, few voices doubted the immediacy or the magnitude of the Soviet threat. SDI was seen as a fresh approach to the arms race that did not involve acquiescence to the inevitability of strategic force escalation. But, as with present NMD proposals, SDI required an enemy sufficiently threatening to warrant the effort expended on the project but not substantial enough to overwhelm it.²⁶ The Soviet threat was anything but insubstantial and this inevitably led to the logic of pursuing reductions in strategic nuclear forces. A twin pronged attack followed, focussing US economic and technological superiority on SDI and coupling this with substantial disarmament efforts. Just as McNamara had unwittingly predicted, the costs of this competition were beyond the Soviet Union and played a large part in its reform and demise. The defences envisaged but never deployed under SDI should therefore be seen as a means rather than an end. It was arms reduction that emerged the real winner from SDI.

Would deployment of NMD have the same effect against regional challengers armed with ballistic missiles? Probably not. Such states have nothing to lose by the acquisition of ballistic missiles and they do not seek to challenge the US on an equal footing or develop missile defences of their own. For the Soviet Union, SDI was as much a political and economic competition as one of technology. Regional powers have no such concerns. They merely seek to complicate US decision making with the threat of unacceptable damage in the event of regional intervention as will be discussed.



A key feature of the initial success of SDI was the wide acceptance it received in the US, a consensus absent in contemporary debate

Another feature of SDI was that the Reagan administration had only just begun wrestling with the requirement to comply with the ABM Treaty and opposition to the militarisation of space. The price of eventual support for SDI from Margaret Thatcher, agreed with Reagan in December 1984, was a four-point list that included the need to ensure SDI was accommodated within a renegotiated ABM Treaty and negotiations for the reduction of offensive nuclear forces.²⁷ In the face of stiff Soviet opposition to testing and deployment of SDI, Reagan

became increasingly frustrated. 'Don't ask the Soviets. Tell them!' he is reported as saying in 1987 during consideration of the potential Soviet response to a unilateral US interpretation of the ABM Treaty.²⁸ Such an ultimatum was never issued and the problem of the ABM Treaty remained fudged at the end of the Cold War. The strategic environment has now changed dramatically but experience with SDI gives at least some indication that the US will go a long way to ensure that it accommodates the opinions of its allies and its treaty obligations in the matter of BMD.

The history of US ballistic missile defences can be seen to have four unbroken strands. First, the US has always been engaged in developing some form of ABM defence with the option of deployment. Research and development have been active but have never provided options that could be implemented quickly enough to respond to changing strategic circumstances, principally due to the complexity of the technology involved. Second, deployment options have consistently been brought out of the cupboard and dusted off for examination on each occasion that the strategic environment has altered. Third, where the option to deploy has been taken up or seriously considered, the final justification has either been at odds with the strategic environment or deployment has simply been overtaken by events. Missile defence has consistently failed to contribute to national security in the manner envisaged. Consequently, ballistic missile defence has served principally as an instrument in arms negotiation. Finally, the ABM Treaty has shown remarkable durability because changes in the strategic environment have outstripped efforts to renegotiate it. Successive administrations have been reluctant to take the alternative step of abrogating the Treaty.

Despite the lessons of history, BMD has shown remarkable resilience in the new security environment. In order to examine whether such defences are a sensible response to that environment it is necessary to examine how NMD has grown up alongside new concepts of national security.

The Cold War was characterised by the rigid nature of its strategic framework, one in which the major issue was the interaction of the two principal actors. Freedman has observed that during this time 'the sense of dynamic interaction between the political context and the instruments of power that is at the heart of strategy seeped away because it was only experienced spasmodically at the margins of the Cold War.'²⁹ The post-Cold War period immediately highlighted this weakness in strategic thought. Cold War concepts of strategy had easily been encapsulated in simple public statements of intent, such as those expressed in Truman's doctrine of Containment, Kennedy's inauguration speech and Reagan's 'evil empire' address.³⁰ The simplicity of the Cold War architecture and the associated paralysis of strategic thought were not conducive to debate over grand strategy. This failing is neatly summarised in Snider's analysis of motivation for the development of US security strategy in the immediate post-Cold War era:

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The impact of the Gulf War was to propel ballistic missile defence back to the top of the security agenda. Its influence can be seen in the events between Bush's keynote address on security in Aspen, Colorado, delivered the day after the Iraqi invasion...

Few in Congress at the time doubted that there existed a grand strategy. The nation had been following 'containment' in one form or another for over 40 years. What they doubted, or disagreed with, was its focus in terms of values, interests and objectives; its coherence in terms of relating means to ends; its integration in terms of the elements of power; and its time horizon. In theory, at least to the reformers, a clearly written strategy would serve to inform the Congress better on the need for resources to execute the strategy.³¹

As a result, the Goldwater-Nichols Department of Defense Reorganisation Act of 1986 required an annual written articulation of grand strategy from the President. Three reports were submitted to Congress prior to 1991 but only one, the 1990 report, attempted to examine the fundamental nature of strategic change. Its production was hindered by the demands made on personnel by the turbulent international environment

at the time. The results have been described as 'schizophrenic, with the reading of the environment in the front at variance with the prescribed response in the back'.³² It is therefore unsurprising that the US emerged from the Cold War in an unassailable position as the sole Superpower but without a fully formed idea of how to wield the instruments of power in the new strategic context. These were conditions of uncertainty in which missile defence options had previously been re-examined.

Just as the Bush administration was getting to grips with the task of defining a new direction for US grand strategy, and at a time when its military freedom of action was arguably at a peak, Saddam Hussein invaded Kuwait. The impact of the Gulf War was to propel ballistic missile defence back to the top of the security agenda. Its influence can be seen in the events between Bush's keynote address on security in Aspen, Colorado,³³ delivered the day after the Iraqi invasion, and the National Security Strategy³⁴ that was published one year later.

In Aspen, NMD merited a single paragraph, promising to 'push forward the great promise of SDI'. SDI was under review at the time. Ambassador Cooper's classified report on the programme had been delivered in March and concluded that SDI's initial goals were now untenable, both technologically and in light of the end of the Cold War. Cooper noted that: although the Soviet ICBM threat still existed the chances of a first strike were greatly reduced; if there were a Soviet attack it was more likely to be a 'rogue' commander or accidental launch; the spread of theatre ballistic missiles would clearly endanger US forces overseas; and there was a small but growing number of third world states that might eventually possess



The sight of Patriot missiles streaking into the skies over Tel Aviv temporarily overshadowed reasoned debate on the merits of NMD and profoundly affected US policy



Bush's letter to Hussein of 5 January 1991, although not explicit in describing the deterrent means, certainly expressed the intent: 'You and your country will pay a terrible price if you order unconscionable acts of this sort'

ICBMs capable of hitting the continental US. He therefore recommended a downsized programme for NMD while pushing ahead with theatre missile defences (TMD).³⁵ Had the Gulf War not erupted when it did, those conclusions might not have been sufficient on their own to prompt the Bush administration to make a firm commitment to deployment of NMD.

The sight of Patriot missiles streaking into the skies over Tel Aviv temporarily overshadowed reasoned debate on the merits of NMD and profoundly affected US policy. It also initially obscured considered debate over the strategic significance of the part played by ballistic missiles in the Gulf War.

Hussein, deprived of conventional means of air attack, employed Scuds in a tactical role against coalition forces, and in a strategic role against Saudi Arabia and Israel. In neither case did he achieve his objective, despite the deaths of 28 personnel in an attack on Dhahran.³⁶ Israel was kept out of the conflict through diplomatic efforts; Saudi Arabia was hardly likely to become detached from the coalition; and the military capability of coalition forces was never threatened. More tellingly, Hussein did not resort to the use of chemical or biological agents, despite the availability of such an arsenal. While the motivation behind this last point has been debated endlessly, there can be no doubt that there was an element of deterrence at work, nuclear or otherwise. Bush's letter to Hussein of 5 January 1991, although not explicit in describing the deterrent means, certainly expressed the intent: 'You and your country will pay a terrible price if you order unconscionable acts of this sort.'³⁷

Hussein had employed exactly the same Scud tactics against Iran but on a far larger scale during the first Gulf War. The enormous psychological impact of such attacks is acknowledged,³⁸ and it has been argued that these attacks were a key factor in compelling Iran to sue for peace,³⁹ something that may have prompted Hussein to revisit the tactic. But the attacks were not a war winning strategy. In the second Gulf War, the use of such weapons failed to result in the strategic paralysis of the US or the fracture of the coalition. It is possible to overcome such crude strategy, something that has been evident ever since the first V-2 was launched. The argument that such weapons are acquired by states primarily as an instrument in regional conflict was borne out by events in the Gulf.⁴⁰ That such states seek to acquire more advanced capabilities with the intent of unleashing destruction upon the US itself was not. The utility of long-range missiles to regional powers will be discussed later. However, the element of deterrence evident in the events of the second Gulf War indicates that opposing states are at least conscious that there is a level of tolerance that can be attributed to the US and do not seek to bring down regime

Patriot played a prominent role in boosting NMD, despite its having been developed outside the SDI programme as an Army air defence system

threatening retaliation. Cooper's report validated the need for TMD but did not justify a resurgence of faith in the strategic utility of NMD.

Nevertheless, the NMD genie was out of the bottle. Patriot played a prominent role in boosting NMD, despite its having been developed outside the SDI programme as an Army air defence system. As Armstrong noted at the time:

*After years of controversy and budget cuts, 'Star Wars' may be about to get a proton of respect. The reason is not so much the program itself, which after years and \$24 billion, is still far from its goal of being able to zap thousands of warheads speeding through space. Instead, it is because of the euphoria over the success of the Patriot system in the Persian Gulf, shifting perceptions of who America's enemies are, and President Bush's decision to narrow the goals of the program. The result is a sharpening debate over the kind of defenses the nation needs.*⁴¹

During his State of the Union Address, twelve days after the first Scuds had been fired in the Gulf, Bush indicated his intent to push ahead with SDI based on developing defences against 'limited ballistic missile strikes, whatever their source.'⁴² The new system was to be known as the Global Protection Against Limited Strikes (GPALS).

Another section in the justification for an NMD, the threat of accidental missile launch, slipped into place in August with the attempted coup against Gorbachev. During the ensuing turmoil, doubts were quickly raised as to whose finger was on 'the button.' Quizzed on control of the Soviet nuclear arsenal, Bush replied 'I don't imagine there's been any change in that. And we don't know whose in charge'.⁴³ Later in August the President seemed rather more confident, stating, 'We had a group as knowledgeable as one can be about Soviet procedures taking a look at this, and I want to reassure the American people that at no time has there been any official concern about inadvertent use of nuclear weapons or something going awry.'⁴⁴ This optimistic conclusion was not reflected in the National Security Strategy published that month, which confirmed the decision to pursue GPALS:

*The threat posed by global ballistic-missile proliferation and by an accidental or unauthorised launch resulting from political turmoil has grown considerably. Thus the United States, our forces, and our allies and friends face a continued and even growing threat from ballistic missiles.*⁴⁵

During a year of unparalleled turmoil, US policy on NMD had undergone a radical transformation. Between Aspen and the new National Security Strategy, events drove the Bush administration to make a solid commitment to pressing ahead with NMD. By December, President Bush had signed into law the Missile Defense Act of 1991⁴⁶ that contained deployment of 'a highly effective defense of the United States against limited attacks of ballistic missiles' as a key goal. This legislation contained the caveat that any such system comply with the 1972 ABM Treaty, despite the fact that these aspirations are mutually exclusive. Article 1 of the ABM Treaty states explicitly that parties undertake 'not to deploy ABM systems for a defense of the territory of its country.' To overcome this hurdle, the Missile Defense Act urged the President to pursue appropriate amendments to the ABM Treaty with the Soviet Union.



The Gulf War clearly had a disproportionate influence on the development of BMD policy, and its immediate aftermath coloured both national security and missile defence thinking

The Gulf War clearly had a disproportionate influence on the development of BMD policy, and its immediate aftermath coloured both national security and missile defence thinking. The use of Scud missiles and the deployment of Patriot to counter this threat carried forward not only development of TMD but also NMD. Even the Vice President of the Raytheon Company, giving Congressional testimony in defence of the Patriot system, noted the unhealthy influence of his company's system on the NMD debate:

Some take strong issue with the notion of strategic ballistic missile defense and the SDI program. They believe that Patriot's success, if unchallenged, will give a boost to SDI and National Missile Defense..... In fact, the threat is different, the technology is different and the mission requirements are different. The case for one should not be made on the case for the other, from whichever perspective one chooses to look.⁴⁷

NMD achieved prominence not as a coherent element of the embryonic reassessment of US grand strategy but as a reaction to rapidly moving contemporary events. As a result, it sat uneasily in the National Security Strategy of the successor Clinton administration; an aspirant capability but not one integrated with the higher priority strategies of regional engagement and non-proliferation. NMD research and development were reinvigorated but at a cost which could easily be accommodated during the ensuing economic boom. NMD was consequently relegated to the position of debating point in Congress, a political football rather than an essential element of grand strategy.

NMD achieved prominence not as a coherent element of the embryonic reassessment of US grand strategy but as a reaction to rapidly moving contemporary events

The 1990's saw a succession of Bills and Acts mandating the President to develop NMD, tackle particular emerging threats or press ahead with rapid deployment. There was limited progress in pursuing amendment of the 1972 ABM Treaty to accommodate US aspirations for a national ABM system, but far greater effort in differentiating between theatre and strategic missile defence systems to enable pursuit of TMD. The latest in the lineage of ballistic missile defence legislation, the National Missile Defence Act of 1999, simply called for deployment of a system capable of defending the territory of the United States against limited ballistic missile attack 'as soon as is technologically possible'. It was this criterion that enabled Clinton to make his decision to defer deployment. NMD was never a critical component of the National Security Strategy for the Clinton administration; it was a continuation of the hedged bet of previous administrations.

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The debate on NMD has been conducted concurrently with successive iterations of the National Security Strategy. These have laid emphasis on defining national interest, developing regional engagement, and building international security structures. Simultaneous with the development of these concepts, there has been a gradual undermining of traditional concepts of deterrence coupled with growing claims from NMD proponents that certain ‘states of concern’⁴⁸ or ‘rogue states’⁴⁹ constitute irrational actors in the international system and pose a direct threat to US security, primarily through acquisition of ballistic missiles and weapons of mass destruction (WMD). For the majority of NMD enthusiasts in Congress the correct response to such actors is the immediate deployment of missile defences. The opposing camp sees pursuit of arms reduction, confidence building measures and non-proliferation regimes as the preferred means of confronting regional security concerns. Madeleine Albright reiterated this policy in her statement following the Clinton deferral decision:

*We are working hard with other countries to counter the proliferation of missiles and missile technology, including efforts to end the missile programs in North Korea, Iran and Iraq. These efforts have our highest priority.*⁵⁰

The latter approach has proved ascendant in successive editions of the National Security Strategy, product of the executive, while the former, backed by vocal Republicans, has dominated proceedings in the legislature. While Republicans claim there is now consensus on the need for NMD, many Democrats remain sceptical that the time has come to deploy the system, or that it will ever come. Which faction is correct depends for the most part on how the US intends to conduct itself in international relations.

During the Gulf War, Bush had talked of the opportunity to build a ‘New World Order’⁵¹ but idealists and those predicting the ‘end of history’ will have been disappointed by the failure to realise their own versions of such a vision. Realist approaches to international relations have persisted in US security strategy, despite the headlining of more liberal methods and goals. The 1991 National Security Strategy began the wide-ranging reassessment of threats to national security and the appropriate instruments of



power that could be deployed to meet those challenges. While the strategy laid the foundations for greater attention to economic, political, global and social concerns, it continued to consider security threats in predominantly military terms: increasing regional conflict; unpredictability in crises; predisposition to escalation and the use of military force; the necessity of altering military force structures; and the desire for a concept of US interests.⁵² This final element illustrated one of the fundamental problems facing the US, the

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need to establish those events or threats that might warrant military response. In the absence of the a perceived monolithic communist threat, the National Security Strategy has evolved three categories of national

interest – vital national interest, important national interest, and humanitarian or other interests – and qualified their associated levels of military response. In the case of vital national interests, US military commitment is robust and unambiguous:

*Vital interests – those of broad, overriding importance to the survival, safety and vitality of our nation. Among these are the physical security of our territory and that of our allies... We will do what we must to defend these interests, including, when necessary and appropriate, using our military power unilaterally and decisively.*⁵³

But as US security strategy has focussed on policies of regional engagement and military intervention where necessary, fears have grown that the proliferation of ballistic missiles will militate against the ability of the US to apply military power in regional conflicts by giving opponents the capability to threaten the United States itself. The paradoxical implications for policy are illustrated in the following two conclusions from the first report of the US Commission on National Security/21st Century:

*Emerging powers – either singly or in coalition – will increasingly constrain US options regionally and limit its strategic influence. As a result we will remain limited in our ability to impose our will, and we will be vulnerable to an increasing range of threats against American forces and citizens overseas as well as at home.*⁵⁴

*The United States will be called upon frequently to intervene militarily in a time of uncertain alliances and with the prospect of fewer forward-deployed forces.*⁵⁵

The Clinton administration saw liberal strategies of regional engagement and non-proliferation as essential to prevent conflicts that might threaten vital national interests. NMD proponents have been more realist and tend to see challenges to US interests as inevitable. It is this threat of intervention that also drives the proliferation of ballistic missile technology in those regional powers of concern to the US. Nations outside US sponsored security structures are faced with overwhelming US conventional intervention in favour of their neighbours in the event of regional conflict. Thus, there are twin motivations for their acquisition of ballistic missile technology: regional competition and the threat from the US. The National Intelligence Estimate on the ballistic missile threat to the United States identified this problem:

*The missile threat will continue to grow, in part because missiles have become important regional weapons in numerous countries' arsenals, and provide a level of prestige, coercive diplomacy, and deterrence that non-missile means do not. Thus, acquiring long-range ballistic missiles armed with (WMD) will enable weaker countries to defer, constrain, and harm the United States.... Their strategic value is derived primarily from the threat of their use, not in the near certain outcome of their use.*⁵⁶

Secretary of Defense Rumsfeld indicated that it is this strategy by weaker states that drives the incoming administration's support for NMD. He presented a counterfactual consideration of deployment at his confirmation hearing:

The failure to deploy appropriate defensive systems could also have adverse effects including: paralysing our ability to act in a crisis or deterring other countries from assisting us; providing incentive to US friends and allies to develop nuclear

capabilities; putting the US in a situation where its only option may be pre-emption; and moving the US to a more isolationist position because of an inability to defend against ballistic missiles.⁵⁷

US uncertainty over the capabilities and intent of belligerent regional powers armed with ballistic missiles stems in part from an underlying loss of faith in the validity of deterrence as an instrument of security strategy

US uncertainty over the capabilities and intent of belligerent regional powers armed with ballistic missiles stems in part from an underlying loss of faith in the validity of deterrence as an instrument of security strategy. This lack of confidence in one of the cornerstones of strategy is worrying. Freedman has eloquently expressed the fundamental importance of deterrence:

At one level, deterrence never goes away. Certain options, whole categories of actions, are precluded because of the possible response of others. Land may be coveted but not grabbed; the unacceptable practices of governments are denounced, but they are left untouched; ideological ambitions are shelved; inconveniences, disruptions, and outrages are tolerated; punches are pulled. Over time, after operations have been delayed and plans shelved, it is forgotten that these operations were ever proposed or that the plans were once taken seriously.⁵⁸

If it attempts to circumvent or simply disregard deterrent postures in regional powers, the US courts behaviour as irrational as that it envisions in potential opponents. The US seeks to guarantee its freedom of action through NMD while weaker states develop their offensive capabilities precisely because they perceive the US is pursuing unconstrained hegemony. Regionally, proliferation may be fuelled by the classical security dilemma, but when such nations consider the security threat posed by the US they find it explicitly stated in that country's national security policy. Viewed in this light, their response is entirely rational.

The world survived a Cold War defined by deterrent structures founded on the possession of nuclear weapons. The protagonists pursued their respective agendas within this deterrent framework, implicitly acknowledging limitations on their freedom of action and pursuing alternative strategies to avoid direct confrontation over critical interests. The era spawned an array of theoretical variations on the central principle of deterrence: existential deterrence; core strategic deterrence; extended deterrence; compound deterrence; collateral deterrence; and peripheral deterrence.⁵⁹ This extended family was a product of strategic ossification, confining strategists to endlessly deconstruct this central concept in the absence of a more dynamic context. The decline in the prominence of deterrence in strategic thinking springs partly from its close association with the Cold War, which obscured its origins in realist logic, and in part from the characterisation of emerging opponents as irrational and therefore not subject to a deterrent framework.

The decline in the prominence of deterrence in strategic thinking springs partly from its close association with the Cold War...

In a comprehensive analysis of the attack on Cold War nuclear deterrence,⁶⁰ Garfinkle has detailed the prolonged campaign mounted against deterrence on both moral and practical grounds. Threatening the destruction of millions of innocent people was believed by some to be morally indefensible under any circumstances. Practically, the doubt persisted that deterrence was inherently unstable and vulnerable to failure. SDI strengthened many of these arguments with its presentation of strategic defences as an alternative to nuclear deterrence rather than a means of bolstering it.

Garfinkle made a telling observation of the effect of this debate on the public at large, which became bored with deterrence and 'tired of hearing the same things and being reminded of the same threats over and over again....it is not deterrence that some people object to, but the fact that maintaining it is a mysterious and costly job that never seems to end.'⁶¹

Deterrence came to be synonymous with Cold War nuclear deterrence. In the public mind, the great debate over threats and nuclear responses should have ended with that conflict. The Gulf War raised its spectre again with respect to ballistic missiles and WMD. Bush's less than explicit response to the threat of Iraqi WMD ultimately served to undermine the credibility of a

There has emerged a widely held perception that, despite all the bluster and speculation during the Gulf War, the US will not resort to nuclear weapons in response to anything less than a nuclear attack

nuclear response to a non-nuclear strategic threat, as has US commitment to the Non-proliferation Treaty, which excludes the use of nuclear weapons against declared non-nuclear states. There has emerged a widely held perception that, despite all the bluster and speculation during the Gulf War, the US will not resort to nuclear weapons in response to anything less than a nuclear attack.

This marks a change in emphasis from Cold War strategy that had envisaged limited nuclear war-fighting options in response to overwhelming conventional Soviet attack. Such strategies could be justified in the context of superpower confrontation but the utility of the nuclear responses against regional powers armed with ballistic missiles and WMD is increasingly questioned. It is the US that now constitutes the overwhelming conventional force and it is the errant regional power that is seen as likely to escalate to the use of WMD.

Accompanying this reversal in traditional deterrent roles is a belief that massive US conventional superiority is capable of delivering 'devastating blows against the economic, military and political power bases of an adversary without resorting to the use of nuclear weapons',⁶² a view championed by Les Aspin as Chairman of the House Armed Services Committee in the 90's. In this argument, conventional deterrence through overwhelming superiority can replace reliance on nuclear deterrence. While the US has certainly demonstrated the ability to shatter an opponent's peacetime infrastructure, it has also demonstrated considerable reluctance to commit the force necessary to terminate a regime's tenure in the type of retaliation that would surely be expected in the wake of a



WMD attack on the US. Forward deployment of superior conventional force may play a role in conflict prevention but should battle be joined it may have little effect on the means employed in war.

Another contemporary attack on deterrence has been the casting of a small core of proliferating states as irrational actors that pose a major threat to the US. Such a threat was not immediately evident in the wake of the second Gulf War when, as Chairman of the Joint Chiefs of Staff, Colin Powell commented; ‘Think hard about it, I’m running out of demons. I’m running out of villains. I’m down to Castro and Kim Il-sung.’⁶³ Since then, the demonising of certain states has been directly related to their acquisition of ballistic missile technology and WMD. North Korea, Iraq and Iran now form a central triad in US threat perceptions, while Libya, Syria, Cuba and others occupy far less prominent positions.

However, threat assessments and discussions have consistently focussed on the technical capabilities of these three nations, while their intent has been either neglected or labelled irrational. This was particularly true of the 1998 Rumsfeld Commission Report on the ballistic missile threat to the US. By contrast, National Intelligence Estimates (NIE) have tended to balance assessments of both capability and intent, as has already been seen in their observations on the motivations behind the acquisition of ballistic missiles by regional powers. As a result, the intelligence community has found itself under attack from proponents of NMD for underplaying the threat. The result of this politicking with threat assessments is to provoke unease domestically and incredulity among allies. The House of Commons Foreign Affairs Select Committee received evidence of both. They heard that an ‘uncoordinated but terrifying army of “rogue states”, “terrorists” and other actors has assembled in the public and political minds against the American people and government’, while an official at the Conference on Disarmament in Geneva informed the Committee that the idea of a North Korean missile attack upon the US was ‘surrealistic’.⁶⁴

...as Chairman of the Joint Chiefs of Staff, Colin Powell commented; ‘Think hard about it, I’m running out of demons. I’m running out of villains. I’m down to Castro and Kim Il-sung’



Finally, deployment of NMD would be yet another indication of a lack of faith in deterrence, or at least an indication that regime-terminating nuclear retaliation by the US is no longer considered a valid option.

Re-invigorating US deterrent strategies would ultimately do more to enhance US national security than NMD. In order for deterrence to work, particularly in regional conflict in support of alliances, an opponent must be made explicitly aware that the capability to inflict credible retaliation is available and will be used. Both the US and regional allies ‘have strong incentives to involve each other in implementing jointly an extended nuclear deterrent strategy to deter the challenger from initiating the use of WMD.’⁶⁵ If the US actually intends to intervene against WMD regional challengers in pursuit of vital interests then those challengers should be made explicitly aware that attack on the US would draw an appropriate

response. Arguments that such a policy would reinforce the perception of chemical and biological weapons as the 'poor man's bomb' are invalid as possession and use of such weapons would in fact expose the challenger to costs that far outweigh their utility as weapons of terror.

Nor is it valid to argue that deployment of NMD would negate the need for nuclear deterrence and permit reliance on overwhelming conventional force. Such a policy would give a regional challenger confidence in his freedom to test those defences, pursuing the potential for massive damage to the US or its allies, safe in the knowledge that the US response might merely be a redoubling of the conventional effort against him.

This also presupposes a perfect missile defence. NMD as currently envisaged is intended to prevent only limited attack, the implication being that this simplifies the technical challenge of missile interception and increases the likely performance of the system. The Vice-President of Raytheon's comments on the effectiveness of Patriot reveal this to be a fallacy with dangerous implications:

In World War 11, the British were faced with trying to adapt their air defenses to the German V1's. As their learning increased, so did their success rates. Five weeks into their new mission, they were successfully intercepting 57 percent of the V1's. Five weeks later their success rate had increased to 74 percent and a week later to 90 percent. Patriot, of course, only shared the first five weeks' experience (and a similar overall success rate), but during that time extensive learning was going on.⁶⁶

Complex defensive systems faced with unpredictable threats are unlikely to work perfectly. Only a supreme optimist would argue that the first limited ballistic missile attack on the US would occur exactly as expected, particularly if opponents develop appropriate countermeasures. It can also be assumed that in the event of deterrence failure there would be more than one such attack. It would be costly to pursue a strategy that relied on a national missile defence that would only function correctly after a period of 'learning'. Was even one missile to pierce the shield, the US would still be faced with the problem of devising an appropriate response. Could such retaliation be anything less than massive, instantaneous and overwhelming? Any other response would signal that the use of ballistic missile delivered WMD is indeed a valid asymmetric strategy for a regional power.

The US desire to maintain its freedom of action when intervening in support of national interests is understandable but deployment of NMD would not remove the deterrent value of WMD to potential challenger states. But neither does the acquisition of WMD alter the deterrent threat posed to a challenger by US forces. It is reasonable to assume that deterrent structures will continue to limit the extent, if not the occurrence, of regional conflict, and confine it in much the same way as Cold War conflict.

The counsel of the 1999 NIE that regional challengers acquire WMD only to complicate US decision-making would seem valid. That is not to say that WMD use could not be provoked in extremis, rather that providing a defence against them may lead the

Was even one missile to pierce the shield, the US would still be faced with the problem of devising an appropriate response. Could such retaliation be anything less than massive, instantaneous and overwhelming?





US to undertake courses of action that would make their employment more likely. Such a contingency would render NMD a hazard to security rather than merely a deterrent irrelevance. If 'states of concern' continue to develop their ballistic missile capability, as seems inevitable if non-proliferation is not achieved and US intervention remains a threat, then the US will be forced to reconsider exactly which interests it considers vital. As Freedman predicts, 'there is not going to be a rush to take on states with nuclear, chemical, or ballistic missile stocks. As we saw in the Gulf, this threat – so long as it is non-nuclear – may not be overriding but it will raise the requirements for intervention.'⁶⁷

It is the proliferation of ballistic missiles and WMD among regional powers, be they friend or foe of the US, which remain the major fuel of strategic tension. If deployment of NMD were to have a detrimental impact on efforts to build an effective non-proliferation regime then it would certainly decrease US national security.

In his discussion of proliferation and critical risk,⁶⁸ Thies has drawn on Ellsberg's detailed theoretical analysis of the likelihood of nuclear war, based on the costs and benefits of 'Wait' over 'Strike', to argue that it is the transition from embryonic nuclear power to more advanced capabilities that poses the greatest risk of deterrence breakdown. Thies's analysis suggests that a regional power would indeed consider a direct attack on the US to be a counterproductive strategy. However, the threat of war due to proliferation is greatest between regional powers with evolving capabilities, such as India and Pakistan. US threat assessments have tended to play down the danger posed by these states because their weapons are not directed at the US and their relationships are seen as in equilibrium. But conflict between such states may soon emerge as a major danger to international security if proliferation is not checked.

Relations between major powers with stable deterrent structures drive the non-proliferation regime. Deployment of NMD would undoubtedly have a detrimental effect on at least one of those relationships regardless of how it is handled.

Russia has as much to fear from the proliferation of ballistic missiles as the US and might even gain kudos from being seen to take a constructive attitude towards amending the ABM Treaty to accommodate NMD.⁶⁹ At the

June 2000 summit meeting in Moscow, the two nations agreed to explore more far-reaching co-operation to address missile threats. That said, there remain concerns that Russia 'will withdraw not only from the START II Treaty but also the whole system of treaties on limitation and control of strategic and conventional weapons'⁷⁰ if NMD is deployed without renegotiating the ABM Treaty. This might damage non-proliferation initiatives, from the Non-Proliferation Treaty to the Nunn-Lugar Co-operative Threat Reduction Program (CTR), and would certainly adversely affect US national security. Fortunately, Russia has a financial interest in programs like CTR and will be reluctant to jeopardise them. Added to this, it might well stand to extract political capital by exploiting a unilateral US decision on NMD in a more positive manner.

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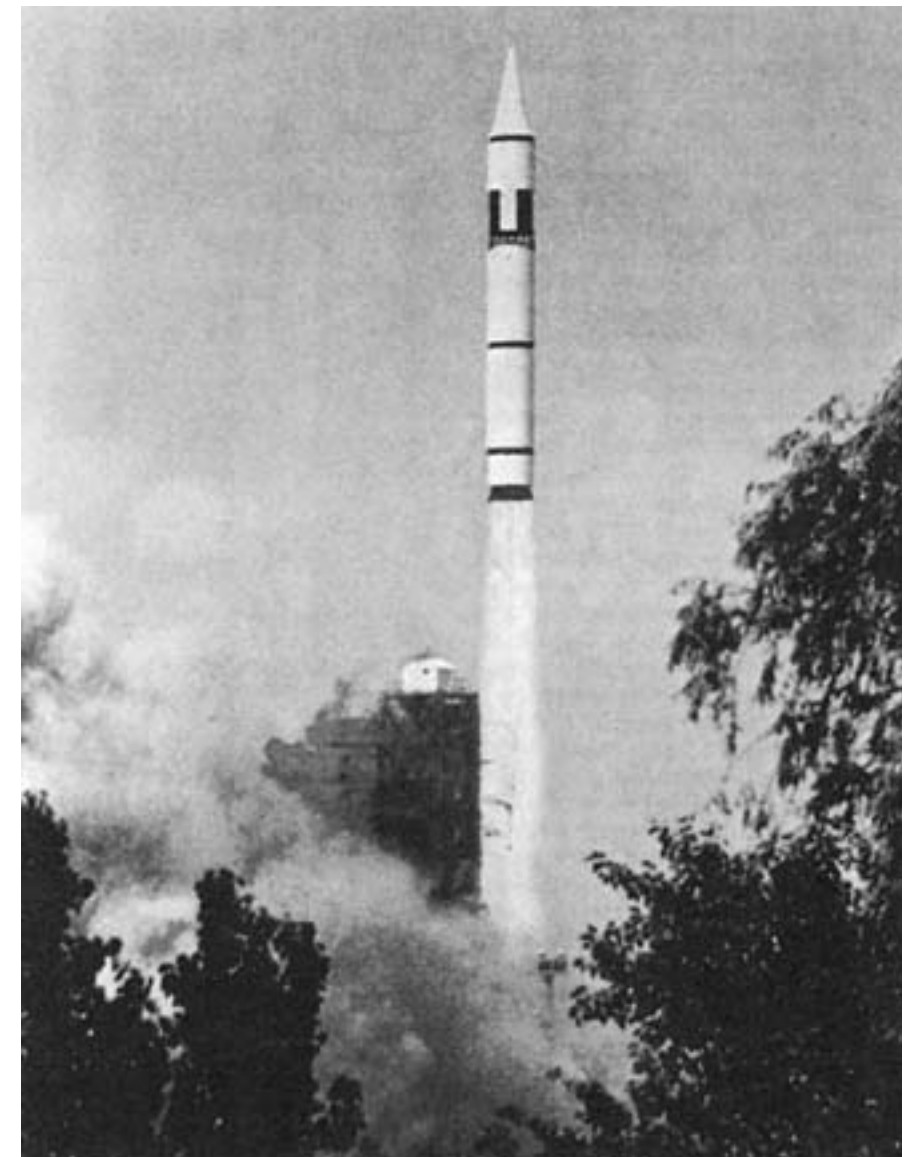
China's situation differs for three reasons. NMD represents a direct threat to its ageing ICBM force of around 20 missiles, it remains in conflict with the US over Taiwan and it has far less political prestige or money invested in the non-proliferation regime. China is likely to modernise its ICBM force regardless of whether NMD is deployed, so such a modernisation would not affect the strategic balance with the US. But with NMD deployed, the costs to China of maintaining that balance will be far greater and could predispose China to more belligerent attitude, including lack of co-operation on non-proliferation. China's position as one of the principal suppliers of missile technology to regional powers would make that a very damaging development for US national security. China also has concerns about US intervention, principally over Taiwan, that mirror those of other regional powers. For China to become convinced of US intentions to seek hegemony through acquisition of NMD would be even more damaging to strategic security.

US proposals for NMD deployment, viewed in company with Congress's failure to ratify the CTBT and its objections to compliance measures in the Chemical and Biological Weapons Conventions, do not promote the belief that the US has much confidence in the multilateral arms control agreements it was instrumental in setting up in the first place.⁷¹ In his findings and recommendations to the President on the CTBT, General Shalikashvili

concluded that 'perhaps more than any other nation, the United States would be negatively affected by an erosion of the international consensus on the importance of nuclear non-proliferation, or by a perception that nuclear weapons are instruments that could be readily used in regional conflicts.'⁷² On the issue of non-proliferation, as with NMD, US domestic political conflict has prompted outcomes that are in conflict with the objectives of US national security strategy.

To return to the criteria for Clinton's decision on NMD, it can be concluded that the President would have been equally justified in deferring deployment on the grounds that national security will not be enhanced, and could well be damaged. It is a measure of US domestic political sensitivity over NMD that he opted for deferment on the grounds of technical immaturity. Viewing strategic ballistic missile defences within their lengthy historical context reveals them to be a largely irrelevant technological option that exists outside the mainstream evolution of the international system. They thrive on the instinctive desire for defence against a troubling threat,

China is likely to modernise its ICBM force regardless of whether NMD is deployed...



and enjoy the support of a considerable military-political-industrial complex. Their deployment has invariably been proposed in response to symptoms of change in the strategic environment. The cure has always lain in treating the illness not the symptoms. The Cold War was ended by reviewing arms reduction and creating the conditions whereby the inherent weakness of the Soviet system could be acknowledged. Similarly, post-Cold War US National Security Strategy has gradually and correctly established regional engagement, confidence-building measures and non-proliferation as the best path to building a more secure international order.

NMD does not constitute a coherent or integrated part of that security strategy. It seeks to guarantee the ability to intervene with military force where interests are seen as vital, an objective which itself creates tension and instability. Rather than pursuing the art of strategy, proponents of NMD would prefer to rely on the blunt instrument of technology. The proliferation of ballistic missiles and WMD is a threat to international security, regardless of which nations acquire them. Demonising certain relatively weak states as part of the justification for NMD only casts doubt on the finesse of US strategic thought. As one Russian politician put it, 'A cannon is not the best weapon to shoot at flies'.⁷³

The 'New World Order' seemed to promise a consensual international system that respected the rights of nations within a common security framework mediated by the major powers. That vision has yet to be realised, and for many nations NMD raises the prospect of unconstrained US power that is at odds with such a system. Those who mould US national security are sensitive to this view. The US Commission on National Security Strategy/21st Century concluded its second phase report with an observation that serves equally well in closing here:

Leadership is not the same as dominance; everyone else's business need not also be America's. Just as riches without integrity are unavailing, so power without wisdom is unworthy. As Shakespeare put it:

O, it is excellent

*To have a giant's strength; but it is
tyrannous*

To use it like a giant.

(Measure for Measure, Act II, Scene 2) ⁷⁴

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The Impact of

ISTAR on Military Deception



‘Deception is the distortion of perceived reality: it is done by changing the pattern of distinguishing characteristics of a thing (object or event) as detected by the sensory system of the target. Magicians call this magic – soldiers call it deception.’¹

B. Whaley

Deception comprises ‘measures designed to mislead the adversary that include manipulation, distortion and falsification in order to induce him to act in a manner prejudicial to his interest’.² In inducing an adversary so to act, surprise³ will be attained and deception is, therefore, a natural weapon in the manoeuvrist arsenal: the adversary is induced to prepare for one Course of Action (CoA) while friendly forces will act in another manner or at a different tempo. Deception is not a substitute for military leadership or warfighting⁴ but, as a force multiplier, it is often attractive when the balance of force is against the practitioner. However, it should also be considered valuable to a superior force not only on grounds of economy of effort⁵ but also in the furtherance of manoeuvrist operational art as ‘strength unaccompanied by strategem will become sterile and lead to a general decline’.⁶ British Defence Doctrine (BDD) recognises the worth of deception as a means to shape an opponent’s perceptions⁷ and United Kingdom (UK) operational doctrine⁸ calls for a deception plan to be considered during the estimate process. However, despite being enshrined in doctrine, many consider that there has been a lack of military deception following World War 2 (WW2) and, since that era, the battlespace has also altered in a variety of ways. Does deception, therefore, remain applicable today? Alterations have included the nature of operations, the international security system and 2, primarily technological, factors that will form the focus of this essay. However, the non-technological factors will first be briefly outlined because they are germane to the overall argument.

Initially, it will be useful to query the apparent lack of deception since WW2, and explore some human factors pertinent to its employment. Since WW2, UK forces have been involved not only in small-scale operations in post-colonial countries such as India, Malaysia (Counter-insurgency (COIN) operations) and Kenya⁹ but also in major Coalition operations such as the 1991 Gulf War and Bosnia-Herzegovina; and the UK conducted operational deception in support of the San Carlos landing in the Falklands Conflict.¹⁰ The United States (US), Israel, Egypt and the Soviet Union (SU), among others, have all employed notable operational and strategic deception plans since WW2 but the extent of employment has been related to the nature of the conflict and the relative strengths of the protagonists. A common belief allied to the myth of the absence of deception is that because Former Soviet Union (FSU) and Chinese military doctrine is steeped in deception, the strategem is confined to closed societies and is incompatible with Western ideals of chivalry.¹¹ 'Maskirovka'¹² certainly remains at the heart of FSU military doctrine and all FSU-trained staff officers are fully grounded in its principles:¹³ witness the Serb employment of deception in 1999 against the North Atlantic Treaty Organization (NATO) in Operation ALLIED FORCE (OAF)¹⁴ and Iraq's operational and tactical deceptions in the 1991 Gulf War. In addition to military activity, however, instances of strategic financial deception abound. For example, in 1994, Mexico achieved global economic surprise when she devalued the peso and totally deceived the International Monetary Fund.¹⁵ These Western examples prove that open societies are fully capable of employing deception together with the commensurate operational security (OPSEC).¹⁶ Military and financial environments share a common problem relevant to deception: it is not the lack of information that is the problem but the torrent of data polluted by misinformation.¹⁷

...the UK conducted operational deception in support of the San Carlos landing in the Falklands Conflict



If any society has the potential to deceive, how has the changing nature of conflict affected the utility of deception? Recent developments in the political and international security system, including the growth of Coalition operations, have certainly had an effect. With the demise of the bi-polar Cold War global structure, Western focus moved away from general war to Operations Other Than War (OOTW) such as limited or regional conflicts, COIN, counter-terrorism¹⁸ and a new genre of operations, Peace Support Operations¹⁹ (PSO), that are motivated by humanitarian interests. Peacekeeping (PK) operations have been conducted under UN auspices, often within a Coalition, with UK forces involved in the Former Republic of Yugoslavia (FRY) in Bosnia-Herzegovina (1995) and Kosovo (1999). Current doctrine suggests that deception may be employed to support appropriate PSO²⁰ especially in Peace Enforcement (PE) operations that employ coercive force.²¹ However, it may not be applicable in every PSO, particularly PK when the need for transparency is paramount²² and its use was expressly forbidden in Bosnia-Herzegovina.²³ The nature of Coalition operations also presents difficulties given the need to develop joint and combined deception doctrine and gain consensus for its use.²⁴ Finally, the nature of the adversary has altered and 'rogue' states and non-state actors (terrorist groups or ethno-nationalist factions) now pose an asymmetric threat. The viability of using deception against an asymmetric adversary²⁵ may be undermined by his diffuse command structure.²⁶ Such an adversary may also lack either the intelligence organization or the technological assets required to detect the signals of the deception plan. Furthermore, there is the problem of progressing a psychological and cultural analysis across a range of increasingly diverse adversaries to reveal potential deception avenues.

With the demise of the bi-polar Cold War global structure, Western focus moved away from general war to Operations Other Than War...

The above discussion has established a broad perspective from which to advance to the technological focus of this study. The past decade has witnessed the introduction of novel military technology with respect to the Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) force elements. Returning to the opening quotation, ISTAR is the sensory system that has created a more transparent battlespace for those who either employ it or who have access to its products; therefore, some believe that it renders deception transparent and worthless. This treatment ignores several issues: the linkage between battlespace transparency and its physical characteristics, the interpretation and limitations of the ISTAR product (which itself may have been 'deceived' through camouflage or signal manipulation) and the essence of strategic and operational deception. Significantly, it also ignores the psychological mechanisms of deception and the fact that these work through human beliefs and perceptions. The second technology-related issue has been the growth in real-time media reporting from the battlespace. In many respects the media may be considered to form an element of the battlespace sensory system. They are now able to disseminate information potentially critical to all levels of

...the media may be considered to form an element of the battlespace sensory system

war in real-time and this could undermine friendly deception plans. In addition to the key factors to be considered, 3 more concerns for the future utility of deception will be mentioned here for completeness. Firstly, deception operations must be planned by a dedicated staff to ensure that planning at all levels is synergistic²⁷ but further work within the UK is required at the strategic level.²⁸ Secondly, another reason for the relative paucity of UK deception could be a general lack of awareness of past deception success and the tangible value of the strategem. In the era of constrained defence expenditure, should not any force multiplier be exploited to its utmost? Thirdly, ambiguity exists concerning the legality of some acts of technological deception that, in future, may be constrained by International Law.²⁹ No apology is made for leaving these final issues undeveloped as such 'enablers' must receive attention once the case for deception in the modern battlespace has been conclusively made. Turning now to the scope of the paper, it must first establish a basis from which the ISTAR and media aspects can be analysed. It will describe what is meant by deception, review its doctrinal foundation and outline its meaning at the strategic and operational levels. The mechanisms through which deception works will then be explored together with an illustration of its quantitative value. Before presenting an overview of the ISTAR and media issues, battlespace characteristics will be considered. Finally, ISTAR and media aspects will be analysed within the security constraints imposed by this paper. The military-media relationship and the ethical considerations of employing the media in deception operations will not be studied in detail. Although some psychological aspects will be described, a detailed study of decision-making theory is outside the scope of this paper. The efficacy of deception will be illustrated by brief references to relevant case studies.

WHAT IS DECEPTION & WHY EMPLOY IT?

Deception is designed to mislead the enemy and to induce him to act in a manner prejudicial to his interests.³⁰ Deception is most effective when used to attain surprise: for example, the prosecution of a friendly CoA disguised by deception will surprise the enemy. Deception has been attractive as a force-multiplier and to gain surprise, but it has never been seen by strategists to be a principle of war in its own right.³¹ Sun Tzu and Clausewitz held differing opinions on the efficacy of deception. Clausewitz considered surprise to be difficult to achieve and that deception was almost always a waste of resources³² but he also recognised its value under specific circumstances: 'the weaker the forces arethe more appealing the use of cunning becomes'. Clausewitz's opinion was a reflection of his time: the growth in size of military formations was not matched by improvements in communications and mobility, and this reduced the utility of deception.³³ Sun Tzu valued deception as a force-multiplier and it is the most frequently discussed theme in the 'Art of War' with emphasis placed on employment at all times and at all levels of war.³⁴ Sun Tzu identified the key starting point for any deception plan – understanding the enemy's innermost thoughts.³⁵ Manoeuvrist operational art identifies potential enemy centres of gravity to be cohesion and the 'will to fight' and both can be undermined by surprise generated by deception.

Sun Tzu identified the key starting point for any deception plan – understanding the enemy's innermost thoughts

Strategic deception is a national or governmental concern;³⁶ the working assumption is that it seeks to portray a false CoA and mask military intentions at either the Grand or Military Strategic levels in order to serve national or governmental objectives.³⁷ UK doctrine for strategic deception remains to be developed³⁸ but it will be an element within the Information Campaign (IC), the over-arching plan involving Government departments and agencies. The military task within the IC will be Information Operations (IO) that must reach down through all levels of war to ensure synergy and unity of purpose.³⁹ IO is divided into Offensive and Defensive IO and deception is placed within Offensive IO (OIO), the aim of which is to alter the perceptions of decision-makers. The NATO strategic definition is that ‘an adversary should be misled about the time, place, strength and nature of intended Allied Joint Operations’;⁴⁰ however, NATO has yet to identify a co-ordination mechanism to obtain strategic political and military consensus amongst the 19 nations.⁴¹ Operational deception must complement strategic deception and will be conducted in support of an operation or a particular phase of operation.⁴² NATO doctrine states that operational deception should be planned at the Joint Force Headquarters (JFHQ) level and should ‘mislead the adversary about the conduct of operations’.⁴³

NATO doctrine states that operational deception should be planned at the Joint Force Headquarters (JFHQ) level and should ‘mislead the adversary about the conduct of operations’

Having described the developing doctrinal foundation for deception together with some working definitions, how does it work and can success be quantified? Deception sets out to create and maintain a lie and most successful deceptions reinforce or capitalise on the enemy’s existing perceptions: because of this, deceptions almost never fail and surprise is often inevitable.⁴⁴ Real events are used to reinforce the deception whenever practicable:⁴⁵ ‘the lie.....was so precious that it should be flanked with an escort of truths’.⁴⁶ As presaged by Sun Tzu, deception occurs inside the brain of the person deceived.⁴⁷ The primary target is the adversary’s intelligence organisation (his sensory system) that produces the supporting analysis for the military decision-maker and monitors the plethora of ‘channels’ of information through which signals (data) are received.⁴⁸ Information can be received from the media, ISTAR assets (including surveillance sensors and means such as electronic, signals and communications intelligence (ELINT, SIGINT, COMINT)) and human intelligence (HUMINT). Analysis of the data reveals the status of the adversary and will influence the assessment of his CoA. Through manipulation of signals, the aim of deception will be to steer the enemy’s analysis to arrive at the desired (but wrong) CoA. However, it will not be all plain sailing as the sheer volume of information can create ‘noise’ to mask the intended data. If the signal is received, it will be ranked according to the credibility of the source or channel.⁴⁹ Independently verifiable and credible information is critical to the success



of the deception: the enemy must work for the data.⁵⁰ Technical deception measures include the generation of false and genuine radio (or other data) traffic to generate noise and confusion.⁵¹ Physical measures may also support deception through military exercises and troop movements, the use of dummy/decoy equipment and camouflage.⁵² The deception must also be tailored to the target's character and indeed several Israeli deceptions failed because the data (bait) was not recognised by Arab intelligence;⁵³ this also illustrates that deception is more a creative act than an exact science.⁵⁴ The theory of *cognitive dissonance* is helpful to explain why deception and surprise are inevitable. A person selectively organises his ideas about persons and things based on a finite quantity of data that can be stored within his personal cognitive world. This world is shaped by his physical and cultural environment, his psychological structure, goals and past experiences.⁵⁵ Once the person has made a decision and chosen a CoA, the psychological situation changes: the theory holds that the individual experiences psychological discomfort when presented with conclusions that do not match his pre-existing cognitive structure.⁵⁶ He will be inclined to place less emphasis on objectivity, and partiality and bias intrude into the evaluation of alternatives.⁵⁷ Military history is littered with examples of dissonance and its costs are frequently high: Montgomery's decision to attack the 'bridge too far' at Arnhem was one example.⁵⁸ The significance of dissonance theory in the era of ISTAR technology will be revisited later but, to close this section, can the military value of deception be quantified? Developing IO policy recognises the need to measure the effectiveness of deception but acknowledges the difficulty in measuring the effects of OIO, and it observes that the absence of quantitative evidence may damage the credibility of the strategem.⁵⁹ In his study of 93 Western military battles from 1914-1967, Whaley found that strategic deception occurred in 76 cases. Whaley's data⁶⁰ revealed that, where present, surprise became steadily more reliant on deception and remained highly probable even in the face of warnings⁶¹ or, in other words, the compromise of OPSEC. Deception is never the sole means to the operational end but it generates surprise, and what price surprise?

Physical measures may also support deception through military exercises and troop movements, the use of dummy/decoy equipment and camouflage





...Napoleon assessed the value of the 'psychological' factors of war to be 3 times the worth of material factors

Whaley estimated that surprise changed the ratio of casualties in favour of the attacker from 1:1 to 5:1⁶² and Napoleon assessed the value of the 'psychological' factors of war⁶³ to be 3 times the worth of material factors.⁶⁴ More recently, Admiral Ellis's conclusion following OAF considered that had IO (including deception) been better used, the conflict would have been shortened by one half.⁶⁵ Surprise increases the probability of a quick and decisive victory whether measured in terms of sought goals, ground taken or casualty ratios,⁶⁶ thus reducing the expenditure of time, effort, resources and casualties.⁶⁷ The ability to generate surprise will also depend on the characteristics of the battlespace, the developing nature of which will now be considered.

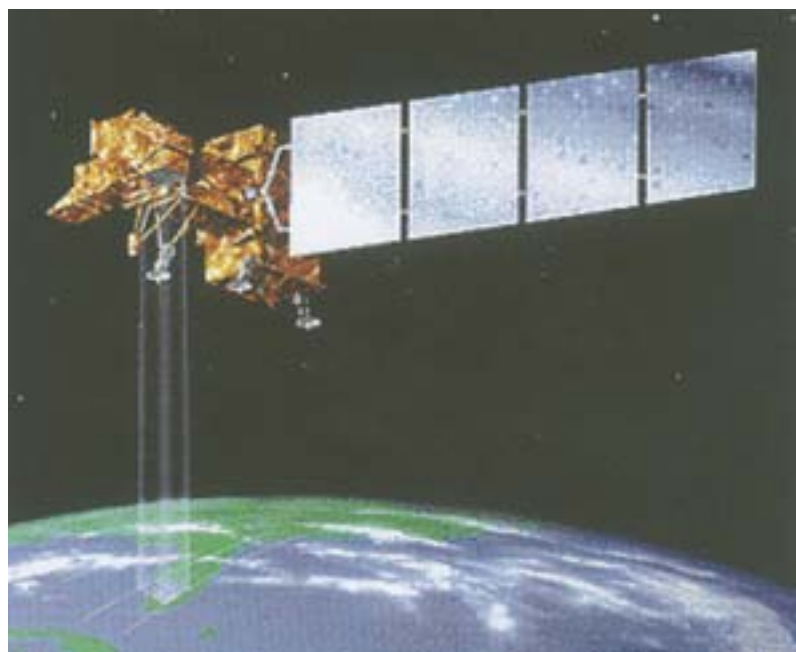
BATTLESPACE CHARACTERISTICS

The means to prosecute deception will depend upon the environment within which operations are conducted – the 'battlespace'. For example, to be effective, camouflage needs to match the environment, extremes of which are urban, jungle and desert. With the increasing urbanization of global society, urban operations in particular are expected to become more prevalent in future. Being filled with non-combatants and dense infrastructure, the urban environment has several unique characteristics: tall buildings, tunnels and sewers give the battlespace characteristics of height and depth that are absent on more open terrain.⁶⁸ Unique to the urban environment is the presence of many non-combatants⁶⁹ who affect operations: non-combatants acted as couriers in the Egyptian defence of Suez City, for example.⁷⁰ In the urban environment, the utility of deception is enhanced for several reasons. Firstly, the physical reaches of deception in the urban geography are increased through the multiplicity of surface spaces.⁷¹ Secondly, no operational environment is 'noisier' and the glut of ELINT, COMINT and SIGINT signals may be masked by the noise generated by non-combatants and commercial activity. Deception can exploit the high level of 'background noise' and confusion, given a high level of coordination and oversight.⁷² Thirdly, decision-making tends to be hastier and less well-informed in the urban environment as urban operations feature degraded C2, stress and high operational tempo.⁷³ Finally, and of most significance to this study, urban clutter blunts the efficacy of current ISTAR technology due to infrastructure masking, electronic noise, interference and propagation difficulties and erodes any technological advantage enjoyed by superior forces.⁷⁴ The overall effect on the prosecution of deception is that the number and power of the intelligence channels available to the target are reduced, albeit that HUMINT and media sources may increase for the party on home (urban) ground. Conversely, the friendly ability to analyse a target's CoA will be subject to noise and confusion and may enjoy minimal ISTAR support. Deception at the operational level was successfully employed in the high-intensity, major theatre urban

conflict of the Chechen defence during the Battle for Grozny in Jan 95.⁷⁵ Deception was employed at all levels of war to both entrap the Russians and to force protect. The background noise was increased because the city was in complete chaos and there were many urban resources available to be exploited for deception (news media, civil communications and HUMINT).⁷⁶ Having now laid the foundations of the strategem of deception, and illustrated the significance of battlespace characteristics to its employment, the specifics of ISTAR and real-time media reporting will be detailed.

ISTAR TECHNOLOGY & BATTLESPACE MEDIA

The continued utility of deception in the face of technological progress was first questioned in 1905 when it was believed that the vastly improved means of information dissemination following the introduction of the telegraph would eliminate surprise on a



Landsat Satellite

During the Gulf War, commercial satellites, particularly the LANDSAT and French SPOT series, were used to support Coalition activities

large scale in warfare.⁷⁷ However, once the telegraph was exploited to send deceptive signals, the technological tables were turned. Developments in ISTAR capabilities that make the battlespace more transparent at the strategic and operational levels include surveillance and electronic signals intercept sensors carried on a variety of airbreathing and non-airbreathing airborne platforms and ground-based collectors. To concentrate first on satellite-borne equipment, ISTAR imagery intelligence (IMINT) data for surface surveillance may be collected from electro-optical (EO) equipment across the electromagnetic spectrum (from the ultra-violet (UV) to the infrared (IR)) and wet-film photography retains value on many platforms. Radar is also used for air, maritime and ground surveillance: high resolution ground surveillance is conducted using synthetic aperture radar (SAR) that utilises the motion of the platform to synthesize an apparently

larger-than-life sensor aperture. Signals intercept equipment provides a real-time feed of mainly military ELINT (but with some COMINT and SIGINT capability) and the sensors are generally cheaper and capable of collection over a much larger geographical area those collecting IMINT. The targets for COMINT, ELINT and SIGINT include all military and political communications, and the electronic characteristics and location of equipment.⁷⁸

The West enjoys a superior information position over many potential adversaries with its ability to collect, process, protect and distribute timely and accurate ISTAR products. Future concepts envisage all ISTAR platforms linked into a system of systems architecture that will encompass national, theatre and tactical sensors.⁷⁹ The US, in particular, has made significant progress towards the next generation of military satellite imagery but she also encourages the use of commercial assets. Satellite remote

sensing is expensive not only because of the launch and payload but also that 90% of the expenditure is needed to support data exploitation;⁸⁰ therefore, a vibrant market for high-resolution imagery has developed.⁸¹ Such imagery was previously controlled by the US and Russia but commercial realities have created the potential for quality imagery to be available on demand by potential aggressors.⁸² During the Gulf War, commercial satellites, particularly the LANDSAT and French SPOT series, were used to support Coalition activities.⁸³ To have true intelligence value, a discrimination of 1m Ground Sample Distance (GSD) or less is required, although 3m GSD sensors can determine the general presence of military equipment. Currently only a limited number of sources possess high-resolution equipment but the first commercial satellite, IKONOS, was launched by 'Space Imaging' in Sep 99⁸⁴ and the first in a constellation of 8 EROS satellites (0.8m resolution) was launched in Dec 00 by the Israeli company 'ImageSat'.⁸⁵ Japan plans to launch the 2.5m GSD Advanced Land Observing Satellite (ALOS) in 2003⁸⁶ and India, Brazil, China and Germany have the potential to develop similar systems: Germany has approved the supply of a 2m GSD satellite to Taiwan. France appears more reticent about the supply of high-resolution images⁸⁷ and the HELIOS 1A satellite was developed as an independent surveillance capability. Although not as capable as current US military imagery, its successor (HELIOS-2) will employ a 50cm GSD sensor.⁸⁸ With an expanding choice of suppliers, potential client states such as Iraq and Libya may find a willing supplier⁸⁹ but customers must wait for their tasking to be undertaken⁹⁰ and the timeliness of the data is subject to orbital dynamics and satellite constellation size. Constant surveillance is not possible away from the equator and even satellites with an oblique viewing capability such as SPOT require to re-visit equatorial latitudes every 3-4 days,⁹¹ customer priority notwithstanding. The main frustration for customer states could be that commercial, high-resolution satellites may be subject to national Government monitoring and intervention. For example, LANDSAT continued to sell imagery throughout the Gulf War 1991 but the 30m resolution was too coarse to provide significant intelligence to Iraq. SPOT imagery (10m) was restricted to customers with Western military security clearances but Russian Soyuz-Karta images (5m GSD) were available on the open market although with restrictions intended to preclude transfer to Iraq.⁹² Prior to the war, Iraq had purchased 20 SPOT photographs of Saudi Arabia and Kuwait with the final delivery made on 2 May 90.⁹³ There was speculation that Russia provided information on the timing of US satellite overflights; however, it would appear that no satellite imagery of the VII Corps western flanking manoeuvre was passed to Iraq.⁹⁴ US Space Command's vision for 2020 acknowledges the concern that the growth of multinational satellite-operating conglomerates may frustrate regulation and, therefore, active measures may be required to deny satellite products to adversaries.⁹⁵ Potential denial measures include the use

With an expanding choice of suppliers, potential client states such as Iraq and Libya may find a willing supplier...

of microsatellites to 'block' the sensor's view and communications jamming or disruption of the controlling ground segment. Destructive anti-satellite (ASAT) measures are also under consideration: the Chinese tested a high-power ASAT laser in 1999 and Russia is believed have a similar capability.⁹⁶ Compared to EO sensors, SAR satellites such as the US LACROSSE are large⁹⁷ and expensive to launch; therefore, commercial satellite SAR resources are currently limited in number and resolution (8m, adequate for ship

classification)⁹⁸ although 3m resolution or less is anticipated.⁹⁹ ELINT, COMINT and SIGINT satellite products remain currently within the military domain.

Moving now to airbreathing and ground-based assets, air and maritime surveillance can be conducted from platforms such as the E3 Sentry Airborne Warning and Control System (AWACS – employed by NATO, US, UK and France), ground-based radars and the Nimrod MR2 and P3 Orion maritime patrol aircraft. Airborne and ground-based collection systems cover a wide range of ELINT, SIGINT, COMINT and Measurement and Signals Intelligence (MASINT) activities. As for ground surveillance, the US Joint Surveillance Target Attack Radar System (JSTARS) is capable of SAR surveillance to 250 km and, using Moving Target Indication (MTI) radar, can locate and differentiate between tracked and wheeled ground vehicles.¹⁰⁰ The UK Airborne Stand-off Radar (ASTOR) will offer a similar capability to JSTARS as will the Advanced SAR improvement on the U2.¹⁰¹ SAR and MTI are expected to be carried on future Uninhabited Air Vehicles (UAV) that have been employed since the Vietnam and Yom Kippur Wars¹⁰² and the US PREDATOR already carries SAR and IR sensors. Current UAVs are much cheaper than radar and EO surveillance aircraft and their COMINT, SIGINT, ELINT and MASINT counterparts (RIVET JOINT, Nimrod R1 and COBRA BALL). All ISTAR aircraft are extremely high value assets and, consequently, are relatively few in number: the unit cost of JSTARS is \$225 million, for example.¹⁰³ Given the cost and sophistication of most ISTAR technology, how much of it is available to potential adversaries through proliferation and do indigenous capabilities exist? Before the end of the Cold War, many 'Third World' states enjoyed rapid economic growth and were able to acquire sophisticated technology. The most spectacular growth was in the Pacific Rim¹⁰⁴ and, despite the Asian economic crisis in 1997-98, China, Singapore and Taiwan remain well placed to purchase.¹⁰⁵ The supply of technology to more threatening potential adversaries (Libya, Iran and Iraq) is largely constrained by embargoes but the future of these is unclear.¹⁰⁶ The US and Russia have increased their exports of military technology: Moscow needs arms exports for hard currency and to maintain jobs. The Russian arms-exporting company *Rosvoorouzhenie*¹⁰⁷ has adopted an aggressive sales policy to China, Iran and Syria, and Iraq is a long-term Russian ally. The success of AWACS has



prompted orders for the next generation Boeing 767-27C AWACS for Japan, and Australia has ordered 4 AWACS 737-700 aircraft.¹⁰⁸ Sweden have developed an indigenous AWACS capability based on the SAAB 340 and the Ericsson 'Erieye'

The Russian Beriev A-50 'Mainstay' provides an airborne control and surveillance capability, albeit not as sophisticated as the AWACS

radar, and Ericsson have teamed with Embraer (Brazil) to produce 5 surveillance aircraft to contribute to the Amazon Surveillance System.¹⁰⁹ Israel developed the 'Phalcon' surveillance system capable of detection out to 400km in a Boeing 707 airframe that was bought by Chile and China and offered to North Korea.¹¹⁰ The Russian Beriev A-50 'Mainstay' provides an airborne control and surveillance capability, albeit not as sophisticated as the AWACS. In April 2000, Russia reached a preliminary agreement to lease 2 A-50s to India, and Rosvoorouzhenie is reported to have entered negotiations with China for the Phalcon replacement.¹¹¹ Iraq was known to possess an indigenous AWACS programme but the doubtful capabilities of the ADNAN 1 (sensor unknown) and the BAGHDAD 1 (utilises the Thomson-CSF Tiger ground-based radar) were never brought to bear in the 1991 Gulf War.¹¹² Although AWACS technology has spread, there is little evidence of widespread proliferation of the more sophisticated SAR and MTI and it is unlikely that rogue states could spring much technological surprise on the West given the cost and technological complexity. However, as with satellite imagery, strategic and operational intelligence support (ELINT, COMINT and SIGINT) may be available from a third party state augmented by ground-based ISTAR equipment which may lack wide geographical coverage but is more readily available. So much for ISTAR in isolation, what now about the effects on deception of the second technologically-driven factor, the real-time media?

Media reports were first filed from the battlespace in the Crimean War but today the ever more pervasive and instantaneous media presence means that tactical acts may achieve strategic significance.¹¹³ How does this real-time presence affect strategic and operational deception? The inescapable tension between the need for OPSEC and press freedom was recognised in 1944 by Eisenhower: 'the first essential of operations is that no vulnerable information should go to the enemy.... The first essential in reporting is wide-open publicity'.¹¹⁴ For study purposes, the 'media' comprise the modern, electronic international news media including TV, radio, wire services and major newspapers that is dominated by American corporations supplemented by a secondary British element. While the US Freedom of Information Act (1966) presumes a media 'right of access', European Governments can employ a range of secrecy laws to contain information;¹¹⁵ however, the direct censorship commonplace in most parts of the world is only used in the most extreme circumstances in the West.¹¹⁶ The idea of excluding the media from an area of conflict has become legally doubtful and increasingly difficult over the last decade.¹¹⁷ Given the freedom of the western media it is not difficult for potential aggressors to gain information on military capabilities, and corporations such as CNN may well have teams employed on both sides of the conflict and could, theoretically, act as intelligence sources for both sides.¹¹⁸ When deception is being attempted, therefore, media knowledge of either the deception or the real operational plan could be highly dangerous.¹¹⁹ The media have the potential to compromise deception-generated surprise in 2 ways: either through the innocent reporting of the facts of the plan or through detached and impartial analysis, revealing strategic options to the enemy.¹²⁰

To add a measure of perspective, however, not every military operation attracts media interest. Some media have both limited resources and a low interest threshold: the slow pace of events in Bosnia proved incompatible with the requirements for a good

TV story.¹²¹ The British-led COIN operations in Oman (1970-75) attracted little interest whereas the US marine landings in Somalia (1992) occupied the opposite end of the spectrum. Although censorship is rarely used, methods may be employed to control the press but, in future, this will very much depend on the specifics of the operation. In the relatively inaccessible environment of the Falklands Conflict, only a very small number of journalists were permitted to travel with the Task Force. Although officially there was no Government censorship, many topics were inadmissible from the outset; furthermore, journalists were largely reliant upon military communications.¹²² By contrast, in the 1991 Gulf War, access to Saudi Arabia was relatively straightforward. The media had become more mobile and self-sufficient, equipped with lightweight camcorders, portable editing suites and satellite communications.¹²³ Control was employed through a media 'pool' that offered journalistic facilities, including membership of select Media Reporting Teams (MRT) in return for the acceptance of limitations, although many editors demanded strict adherence to the rules out of patriotism.¹²⁴ Patriotism was not so evident when the US deployed to Haiti (Op JUST CAUSE) and several hundred journalists, including 8 CNN crews, preceded the US deployment despite the President's request for a voluntary news embargo.¹²⁵ Such an action illustrates the media's potential to undermine the OPSEC associated with an operation or strategy but, in contrast, OPSEC was maintained when the MRT journalists were briefed about the DESERT STRIKE battleplan in advance.¹²⁶ Turning to the compromise of strategy, there was open media speculation about potential Coalition strategy before and during the 1991 Gulf War. Many broadcasts discussed the potential for the American



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and British flanking manoeuvre¹²⁷ and on 11 Feb 91, *Newsweek* published a map that, Schwarzkopf recalled, 'almost exactly depicted our flanking plan'. Iraq obtained little intelligence from her very limited ISTAR assets and used the BBC, Radio Monte Carlo and CNN as her main sources.¹²⁸ Despite the potential compromise of strategy, however, Iraq seemed to draw little to inform her analysis about the Coalition's intentions.¹²⁹ Nevertheless, media speculation about newsworthy conflicts must only increase in the future given the ever-growing 24-hour news industry. With the volume of media-generated information set to

increase, the trend for large numbers of journalists to be present will continue, fuelled by the absence of travel restrictions. Many agencies employ fiercely ambitious and cheap 'stringers' (freelance journalists) who are eager to make their reputations and who pay little regard to the restrictions and dangers of the theatre. Forty journalists were captured by the Iraqis in Basra during the Gulf War, a small number of British, French and US 'unilaterals' reported from within Iraqi-held and restricted Saudi territory,¹³⁰ and an estimated 49 journalists were killed during the early fighting in Yugoslavia in

1993.¹³¹ In addition to the presence of unaccredited journalists, the level of military control may be further undermined in PSO given that UN forces have been forbidden to provide press facilities as this would imply a degree of unacceptable bias.¹³² The increasing ease with which information can be disseminated from the battlespace has the potential to give the adversary advance information on troop concentrations or manoeuvres about which he may have been unaware. Information disseminated from the non-accredited and uncontrolled media poses the worse danger.

ISTAR, MEDIA & DECEPTION

...Israel and the US were totally surprised by the Egyptian assault on 14 Oct 73...

The above discussion has examined some key factors of ISTAR and media reporting and it is now necessary to analyse how they affect the employment of strategic and operational deception. How transparent has the battlespace truly become to both friendly forces and potential adversaries, through the use of ISTAR, and does deception still have a role in strategic and operational art? With respect to the media, can deception be sustained following the compromise of OPSEC, and is harm done by open media speculation about friendly CoA? Finally, does the real-time impact of media reporting and some ISTAR assets have the potential to unseat a strategic or operational deception plan? To recap, although doctrine at the strategic level is being developed, strategic deception should seek to mislead about military and political objectives while operational deception seeks to mislead about the conduct of the military campaign or a phase of operation. Both seek to have the adversary determine the wrong friendly CoA – deception must help him to be quite certain, decisive and wrong!¹³³ Deception works through the psychology of misperception¹³⁴ and seeks to confuse the target so that he is unsure as what to believe or to mislead him by building up an attractive view of the wrong alternative.¹³⁵ Some illustrative detail has already been described and 2 further case studies will be employed. Firstly, OAF (1999) as it exemplified successful operational deception in the face of overwhelming ISTAR superiority. Secondly, the Egyptian strategic and operational deception in advance of the 1973 Yom Kippur War, because it occurred despite Israeli ISTAR advantage and Egyptian media compromise of OPSEC.

Turning first to OAF, despite extremely high levels of the most sophisticated Allied ISTAR tasking, coalition targeting and surveillance were frustrated by relatively simple deception techniques. For example, military logistics and armoured vehicles were moved at the same time as refugee columns: JSTARS could discriminate between tracked and wheeled vehicles but not between military and civilian tractors and trailers.¹³⁶ A fatal misidentification occurred at Djakovica when Serbia alleged that 75 civilians were killed and NATO admitted to targeting ‘military’ vehicles and hitting 2 convoys.¹³⁷ Through tactical measures of camouflage and concealment, the Serbs achieved operational deception with respect to the number of items of military equipment destroyed. NATO claimed that 60% of the Serb artillery and 40% tanks were either damaged or destroyed; however,

the NATO assessment team revised down the initial figures of 449 artillery and mortar pieces to 389, and only 3 damaged T55 tanks were found in Kosovo.¹³⁸ Moving now to the Yom Kippur War, the surprise generated by the Egyptians provides an excellent example of the triumph of cognitive dissonance in the face of apparent hard fact. Israel knew about the build-up of forces on the Egyptian side of the Suez Canal from US intelligence, electronic surveillance, photography from the US SAMOS satellite and HUMINT.¹³⁹ Despite this, Israel and the US were totally surprised by the Egyptian assault on 14 Oct 73 but, as Kissinger stated: 'Nobody made any mistakes about the facts'. Following the Arab defeat in the 6-Day War (1967), Egypt had re-equipped and re-organised her armed forces with Russian assistance and many call-ups of reservists and deployments along the Suez Canal were conducted. The partial Israeli mobilizations in response were so frequent that the likelihood of war was undermined because no military action followed the Egyptian call-ups, in effect Israel was conditioned to ignore the preparations for war.¹⁴⁰ In May 1973, the CIA obtained the Egyptian plan of attack for Yom Kippur but failed to believe that the scheme was serious.¹⁴¹ Closer to the attack, the Cairo-based Middle East News Agency reported the Egyptian 2nd and 3rd Armies to have been put on alert on 2 Oct 1973.¹⁴² President Sadat kept the invasion date secret, the build-up was assessed as another 'demonstration' and the strategic surprise on 14 Oct 73 was complete. As described theoretically in an earlier section, decision-making requires a set of hypotheses about the enemy against which to test all the received signals. The cultural barrier between Arab and Israeli affected the analysis and cognitive dissonance prevented an objective view being taken of many signals including those from ISTAR and the media. Following the Arab defeat in 1967, Israel had been conditioned to believe in her superiority and, in 1973, could not envisage that the climate was right for an Arab assault. The Arabs were willing to risk military defeat to improve their political position and the Israelis were unable to anticipate this behaviour.¹⁴³ The evidence from the Yom Kippur War tends to reinforce Whaley's statistical conclusion that high-level deception is almost always successful regardless of the sophistication of the victim.¹⁴⁴

ISTAR technology has certainly enhanced the ability of those enjoying access to its products to gather large quantities of data about the adversary and seed the analytical process. The 2 case studies show that analysis must not merely concentrate on capabilities: the adversary's *intentions* are required to determine the most likely CoA, particularly at the strategic level where the CoA might be hidden within the mind of the decision-maker. The difference between the levels is seen in the CoA – *the decision to use military force*, rather than the more



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tangible operational CoA, the detail of an invasion plan or operational phase – the *where, when and how?* Intentions at these higher levels are difficult to observe directly and must be inferred. Even observed operational movements and concentrations require objective analysis: are they localised tactical manoeuvres, feints to generate future complacency, or the first operational strokes on a masterpiece to be created through operational art? ISTAR IMINT assets are particularly useful to gain tactical or operational information on capabilities and concentrations but COMINT may come closer to revealing intentions. However, information must be credible and the enemy must work for it: he might ‘collect’ the real battle plan but if ignored by the (human) analyst, the real CoA may remain masked. Acceptance of manipulated data, the presence of cognitive dissonance and the sheer volume of data all influence the analytical process. Deception at the higher levels has an opportunity to succeed in the face of the most sophisticated technology because of the requirement for the CoA to be inferred through the human cognitive process. Aside from this, ISTAR platforms possess technological limitations that could undermine the credibility of their data and their operational features could be exploited to deny or frustrate success: surveillance should be undertaken only with the full consciousness of the likelihood of deception.¹⁴⁵ Firstly, assuming credible ISTAR data, there are several obvious operational weaknesses that undermine ISTAR’s seemingly ubiquitous power. ISTAR assets are vulnerable to the effects of the adversary’s counter-surveillance effort.¹⁴⁶ Space platforms may be denied through passive or ASAT measures and they have predictable orbital characteristics that can be exploited to plan movements of men and matériel. Furthermore, space IMINT is not available instantaneously and EO sensors will be denied by poor weather: evidence from the 1991 Gulf War suggests that 3 days were required to revisit the complete range of targets and up to 18 hours elapsed between collection and the image reaching the analyst.¹⁴⁷ Air-breathing platforms are vulnerable to high value asset attack (HVAA) to either destroy the platform or to force it from the tasked surveillance area. For example, due to Coalition air superiority in 1991, Iraq was unable to employ her very limited airborne EO and SIGINT/COMINT capabilities.¹⁴⁸ Less vulnerable to HVAA and more numerous are the UAVs, but they are currently less capable than manned aircraft (although UAV replacements are being considered for AWACS and JSTARS). The conclusion is that only limited volumes of battlespace may be transparent at any instant, given the relatively small numbers of ISTAR assets and their operational limitations. Secondly, the credibility of ISTAR data can be undermined by technological or topographical means. Surveillance of the Warsaw Pact’s invasion of Czechoslovakia (1968) was hidden by jamming and anti-radar chaff¹⁴⁹ and, while the technological resilience of modern ISTAR sensors has improved, such measures cannot be ignored and were successfully employed in OAF. Camouflage remains a potent counter-ISTAR technology that can defeat UV, visual, IR, thermal, photographic and radar sensors:¹⁵⁰ a multi-cornered metal reflector can mimic a tank on SAR, for example.¹⁵¹ The employment of counter-ISTAR camouflage against adversary ISTAR will be vulnerable to ‘eyes on’ adversary HUMINT, the prevalence of which will depend on the battlespace characteristics.¹⁵² Finally, ISTAR performance is degraded by battlespace topology. Mountainous or jungle terrain and the structural and human characteristics of the urban environment are especially difficult to penetrate with ground surveillance assets. An asymmetric enemy could draw conflict into areas where ISTAR technology is degraded to support his own deception measures. Saddam Hussein could, for example, have chosen to fight in Kuwait City rather than on the desert terrain that favoured

the Coalition ISTAR.¹⁵³ ISTAR's vulnerabilities are often forgotten and too much faith can be placed in the infallibility of technology.¹⁵⁴ In WW2, the Germans' absolute faith in the cryptographic technology of Enigma resulted in their being deceived, and electronic or physical spoofing applied to JSTARS or ASTOR could have a similar effect.¹⁵⁵ Data saturation is an especially significant problem in the modern era with the multiplicity of data sources, especially with respect to SIGINT/COMINT/ELINT, and analysts need to be selective to avoid being overwhelmed. Giving the most weight to the most prestigious ISTAR asset is also problematic as the deceiver could target this as a priority. In the future intelligence 'systems of systems' may counter this and all-source data will be impartially integrated into a coherent picture by software algorithms,¹⁵⁶ not the dissonance-susceptible, over-loaded analysts. The integration algorithms may have a human designer, however!

Having first looked at ISTAR, what are the effects of media reporting from the battlespace? The successful deception during the 1991 Gulf War and experiences such as the compromise of OPSEC before the Yom Kippur War show that deceptions have worked despite media CoA speculation and the compromise of OPSEC.¹⁵⁷ Deception works by reinforcing the adversary's beliefs: Iraq expected the Coalition to launch an amphibious assault and Israel did not expect Egypt to go to war. However, would the deceptions have worked had ISTAR served to corroborate the data received from the media? In the 1991 Gulf War, the Iraqis were reliant on the media as a main source of information and they lacked detailed information on Coalition force concentrations. The heavy media coverage of the US Marine Corps' training suggested the amphibious landing in Kuwait to be the most likely CoA, thus masking the true CoA, the western flanking manoeuvre of VII Corps. ISTAR products showing the VII Corps assembly areas could have alerted the Iraqis to the real CoA and given some credence to the alternative media speculation about the flanking manoeuvre. However, analysis is a critical part of the process; for example, in 1973 the Israelis had substantial ISTAR resources to observe the build-up of forces but the analysis apparently ignored ISTAR products and the corroborative media alert. In addition to ISTAR and other signals, the media present one more element in the analysis burden. The relative value of media sources is difficult to gauge but, largely, the relative standings of the accredited, 'controlled' journalist and the unaccredited, 'uncontrolled' stringer is marginal to the argument because deception is a 'need to know' subject about which journalists will not be briefed. While material from accredited journalists may attract a greater weighting in analysis, the pertinent issue is the credibility of the information. Intelligent

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speculation may be helpful to an adversary, particularly one from a different culture, but non-democratic aggressors may treat any media information with caution given that they use the media to perpetuate deception themselves. Although this is considered unethical in the West,¹⁵⁸ during the Battle for Grozny (1995), the Chechens used the media for a strategic level disinformation campaign that presented a prejudicial view of the Russians and was also used to target the neighbouring Republics in an effort to widen the war.¹⁵⁹ Ultimately, intelligent media speculation is not hard fact and the enemy's analysis will include his own speculative thoughts; the media effect will be to add further subjectivity to the process.

A strategic deception which may span months or years of preparation will not be undermined by real-time and localised snippets of media data...

with the resources of the media corporations. In parallel, real-time ISTAR assets such as JSTARS are also relatively localised in their surveillance areas by sensor performance and the number of platforms. Again, this reinforces the view that only specific volumes of battlespace may be potentially transparent at any instant. At worst, the media may broadcast information on movements or concentrations of friendly force about which the adversary may have been ignorant. This will enable him to react in some manner and it may reduce the friendly ability to achieve total surprise or it may undermine a tactical advantage. However, the information represents localised tactical data, and the adversary will have to relate its significance to the higher-level plan. Furthermore, he may be unable to act in time to take advantage of the tactical detail and any action not aligned to upsetting the real friendly CoA may be wasted effort: the tactical action reported on may have been a feint. A strategic deception which may span months or years of preparation will not be undermined by real-time and localised snippets of media data: by the time the journalists are reporting, the strategic deception plan should already have been successfully employed! On the operational side, the planning cycle currently looks up to 72 hrs ahead and throughout the battlespace. Compromise of the operational deception plan is also unlikely to be unseated by a localised real-time feed of media or ISTAR product.¹⁶⁰ What is observed or reported at the localised, tactical level represents a 'snap-shot' in time and space within a larger window of operational effort. The enemy analyst would have to infer the

Finally, real-time media reporting can deliver a more immediate effect than most ISTAR platforms, especially when compared with the example of the 3-day 1991 Gulf War strategic IMINT cycle. A tactical action may have strategic effect in that the media may reach a target audience before the military chain is able to report. However, it is likely that the real-time media feed will come from a relatively localised area dictated by prevailing security conditions (from where it is acceptably safe to report or from where media access is permitted) together

...during the Battle for Grozny (1995), the Chechens used the media for a strategic level disinformation campaign that presented a prejudicial view of the Russians...



developing operational plan from an extrapolation of many 'snap-shots': while not impossible, the lack of a truly transparent whole battlespace, cognitive dissonance and the multiplicity of sources in the analytical process will intervene to ensure that operational deception remains viable.

Several significant factors affect the utility of strategic and operational deception in the modern battlespace. Changes in the nature of global security and military operations have caused a growth in OOTW, including PSO, and deception may not always have a place in support of operations in which total transparency is mandated. The rise of the asymmetric threat has illustrated the importance of understanding the adversary's decision-making process to determine whether it is open to deception. However, while these factors are germane to the argument and work is required to develop UK policy at the strategic level, this analysis has concentrated on the technological factors of ISTAR and real-time media reporting. The heart of the matter is whether the twin aspects have rendered the battlespace, and thus any strategic or operational deception transparent. Do these developments evoke a return to Clausewitz's era when the absence of deception was merely a reflection of the times? At the higher levels of deception, the answer is a qualified 'no'.

The examination of the characteristics of the future battlespace revealed both a likely growth in urban operations and that this environment severely degrades the utility of current ISTAR technology. In the light of ISTAR's current limitations both now and in the near future in the urban environment, anticipated developments in urban ISTAR technology were not examined because they will not affect the conclusions of the analysis. Western nations have been shown to enjoy a technological advantage over most potential adversaries although commercially available EO IMINT has the potential to narrow the gap in strategic and operational intelligence collection. The development of indigenous capabilities would be a major undertaking by most potential aggressors and technological surprise will be unlikely. Notwithstanding Western ISTAR technological superiority, all sensors and platforms are subject to limitations including counter-ISTAR deception, and this means that total battlespace transparency is currently unattainable. Regardless of its technological superiority, the West has, therefore, remained vulnerable to an asymmetric adversary's deception as amply illustrated by Iraq and Serbia within the last decade. If an asymmetric adversary can deceive in the face of ISTAR superiority, the strategem must remain a valid CoA for the superior force. Of greater relevance to the higher levels of war, however, and setting aside ISTAR's technological limitations, the underlying reason for deception remaining a viable strategem is the human decision-making process. At the strategic and operational levels, the CoA must be inferred from observation and analysis; this process will be influenced by factors such as the volume of information, its credibility and source, and the pervasive human condition of cognitive dissonance. No amount of ISTAR observation can uncover what is within the human mind: for example, in 1973 were the Egyptians exercising or preparing for war? Despite advances in technology, the human mind has become no less susceptible to deception, indeed, the increasing dependence on the automatic processing of increasing volumes of information may make it more vulnerable,¹⁶¹ especially if the dependence favours an ISTAR sensor that is being deceived. At the strategic-level, the human processes can be expected to influence heavily the analysis of the CoA, as

demonstrated by the cultural and cognitive dissonance prevalent in Israel before the Yom Kippur War. Deception works to reinforce perceptions that may be immutable due to cognitive dissonance.

Analysis of the real-time media presence in the battlespace suggests that this is less of a problem to the viability of higher-level deception than may first have been thought. The media presence will only become more pervasive and less controlled in future, and will have some potential to disrupt operational level plans by inadvertent compromise of OPSEC or through informed speculation to reveal military options. However, although information from accredited journalists may attract some weighting in analysis, media speculation constitutes one more piece in the analyst's jigsaw, and a fairly intangible one at that. Evidence from the 1991 Gulf War illustrated the apparent lack of effect that open (and accurate) media speculation about the Coalition flanking manoeuvre had on the Iraqis, who lacked detailed ISTAR data. The more interesting area of study is the effect of real-time reporting upon the higher levels of deception and whether they would be undermined by the immediacy factor. ISTAR limitations, coupled with the human cognitive process, show that the battlespace is not fully transparent in real-time and a parallel is evident in real-time media reporting. It is certainly possible for instantaneous media reporting to cause tactical actions to have strategic effect; however, such reporting represents a 'snap-shot' in time and space, of clear relevance to the tactical level, but not of much significance to operational deception. The information presented may be detailed and accurate but, being media-sourced, it may carry little corroborative weight in the analysis. Furthermore, higher-level plans would have to be inferred from a series of fairly localised tactical observations. It is considered that the value of strategic deception will be unaffected by real-time media events and there may be a minimal effect at the operational level.

Overall, deception can succeed in the face of ISTAR superiority and the presence of media within the battlespace. Equally, the technologically superior force remains able to employ the strategem as can the adversary. Deception plans must continue to be developed to further operational art and to maximise economy of effort as historical experience illustrates that deception can reduce the cost of conflict. The FSU considers that it has not become too difficult to deceive in the face of ISTAR, it merely requires more resources and resourcefulness,¹⁶² and planners have had the opportunity to see how exported systems fared against US-led Coalitions in the 1991 Gulf War and OAF. Such details will not have been lost on other potential adversaries. In this technological era, the serviceman needs to maintain a healthy scepticism about the true capability of ISTAR and an awareness of the potential of the media to act as a limited sensory system. Neither presents the silver bullet of full battlespace transparency. Neither will undermine the utility of strategic and operational deception while human factors are central to analysis. What the magician calls magic and the soldier calls deception remains a valuable tool of strategic and operational art.

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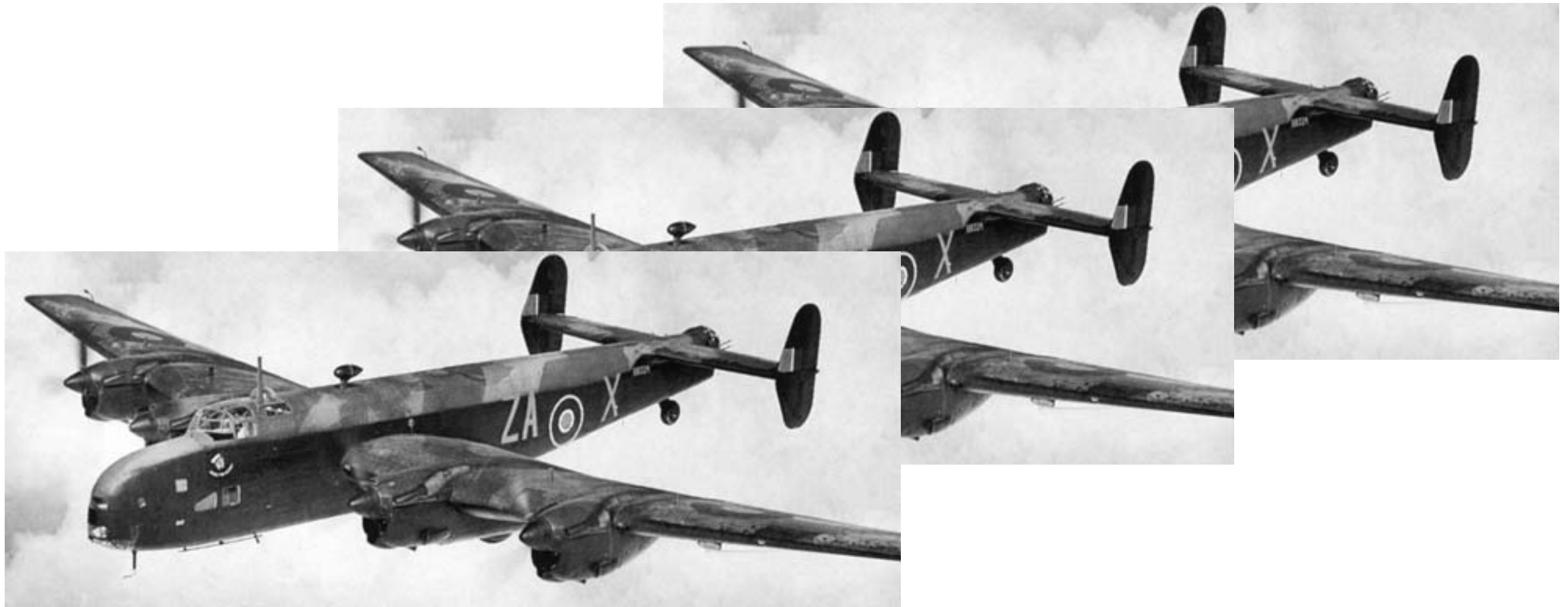
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Halifax B MkII, Series 1, of No. 10 Squadron, RAF

Dresden



In the early spring of 1945 Bomber Command carried out the most devastating air attack ever known. If the number killed can be used as a yardstick, compare the fatalities of the American nuclear attacks on Japan with the 'conventional' weapon attack on Dresden. Hiroshima death toll 71,379, Nagasaki death toll over 80,000, Dresden 135,000.

Our Nation had been at war for five years and during that time Air Chief Marshal Sir Arthur Harris had advocated his area bombing policy to the Government and to the Chief of Air Staff, a policy to shorten or even end the war, but to no avail. Eventually it became expedient for the Government to re-appraise his policy, and the outcome was the attack on Dresden.

The following pages are a collection of documents from Groups, Squadrons and Intelligence units that had actual participation in the attack – these are contained in the Introduction, and are followed in the main section by statements from Politicians of the day, recollections of airmen involved, figments of imagination by so called Air Historians and transcripts or copies of letters pertaining to the attack.



Sir Arthur Harris

In no way do they reflect completely my personal views. I have only endeavoured to put together a jumble of documents written by people who should have the facts but, at the end of it all, I found myself left with the following thoughts:-

Why was the 'Establishment' so defensive about the reason for the attack?

Why were they so embarrassed by the outcome of the attack?

After all we were at war and the object of the exercise was to win by all means possible with minimum loss to us.

To people of my generation Harris had an option that appealed. To some of us it could mean that we would celebrate our 21st Birthday!!

INTRODUCTION

Whilst peace may be described as 'absence of war', such a desirable condition is seldom based on the absence of armed forces, for it is the prime peace time function of armies, navies and air forces to preserve the status quo by diligent rehearsal of their ultimate wartime roles. Such is the essence of deterrence, freedom is worth fighting for, but it is preferable that it should be defended before war becomes the sole remaining alternative to subjugation.

Prior to WW2 successive British governments had done little to prevent the war and even less to prepare for it. Therefore when war became inevitable, thousands of soldiers, sailors and airmen were sacrificed by poorly planned, poorly equipped units sent to attack targets that had little or no military significance when balanced against the ultimate objective.

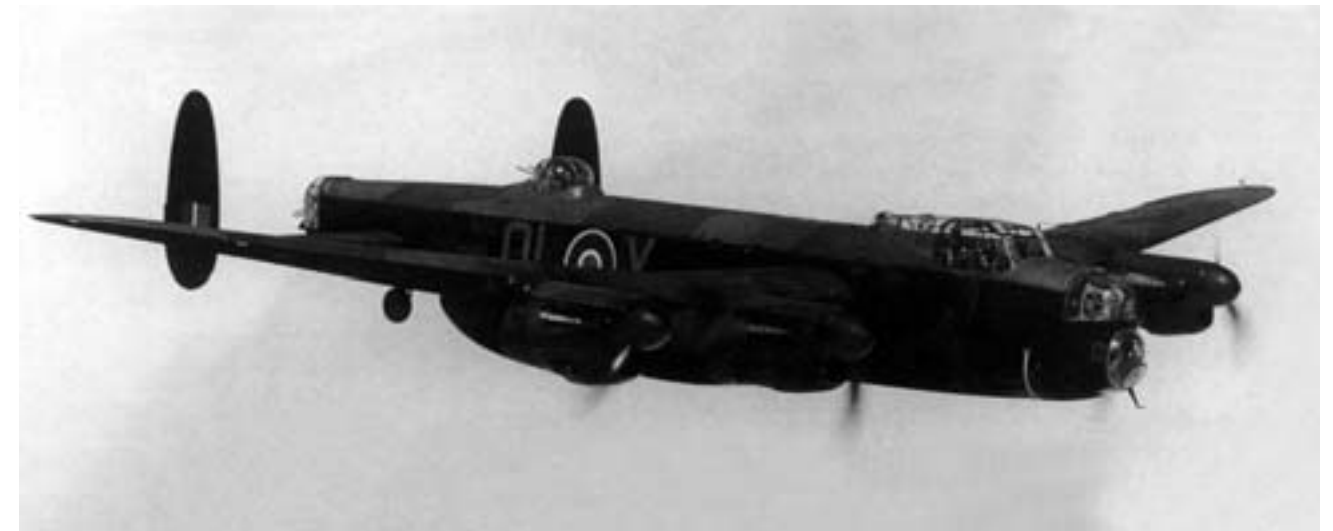
Military records now indicate extremely poor leadership and little support from certain sections of the Government for a swift conclusion to the war. It took the Royal Air Force more than three years to rid itself of poor quality leaders and to demand and get in unequivocal terms of reference its priorities and objectives from the Government. It also took the Government almost as long to decide that war was not a game that had rigid rules, and once entered into, had to be won. Decisions, however hard to make, required responsibility from the Government and history records show some of our Leaders of the day have endeavoured to duck their responsibility for actions that took place on their recommendations.

The account that follows is one such action, but before commencing, let us look at the RAF Command that was responsible for carrying out the Government orders from the opening of hostilities in 1939.

At the commencement of hostilities in 1939 until early 1940 the AOC. Bomber Command was Sir Edgar Ludlow Hewitt, a lack lustre leader, who was replaced for a brief period by Sir Charles Portal. On October 4th 1940 Sir Richard Peirse became AOC. when Sir Charles Portal became Chief of the Air Staff.

During this period London was being blitzed to a degree that newspapers were describing the German attacks as 'Terror Bombing' therefore it wasn't surprising when Portal tried to get our so called 'Precision' bombing policy changed to that of carpet bombing as a reprisal technique. Also it will be recalled that by the Rules of Warfare agreed by a Washington Conference on the limitations of Armament (1922), aerial bombardment for the purpose of terrorising civilians, destroying private property or injuring non combatants is prohibited! What a ludicrous state of affairs. The Germans however had no such scruples for on the night of November 14-15th 1940 their aircraft bombed Coventry. Righteously indignant the British public demanded city for city retaliation and the Government concurred. Within 24 hours the order had gone to Bomber Command that in future they would simply aim at the centre of any town they attacked. However, at this time Bomber Command attack techniques were disastrous failures due to poor navigation standards, poor bombing ability and poor equipment compounded with poor leadership. Lord Cherwell's examination observed that fewer than one aircraft in three had bombed within five miles of the designated targets and mostly in open country.

Lancasters and Halifaxes alike were now able to carry upwards of 8,000 lb of bombs on an average mission, which was more than twice the amount the Fortresses and Liberators could lift



Things had to change and in February 1942 Sir Arthur Harris became AOC Bomber Command, recalled from Washington where he headed the RAF delegation, to replace Peirse due to his complete failure of bombing policy. He (Peirse) went to India and continued his service with equal lack of distinction.

Harris had a formidable task to undertake, but his basic belief was that a bomber force of sufficient size could make the enemy capitulate by systematic destruction of large centres of population. Gradually under his leadership Bomber Command efficiency and striking power became a formidable military machine but Harris was limited in his action by the Target Priority listing given to him by the Casablanca conference. He observed these directives but still clung to his original idea that a plan drawn up, in early 1944, known as 'Thunderclap' based on the theory that one massive 24 hour coup de grâce on Berlin, or

some other city or cities, could conclude the war overnight.

Lancasters and Halifaxes alike were now able to carry upwards of 8,000 lb of bombs on an average mission, which was more than twice the amount the Fortresses and Liberators could lift. All in all Bomber Command had now become the most powerful and efficient force of its kind the world had ever seen.

'Thunderclap' did come up for consideration at this stage but there was considerable argument and confusion over which city should be used to jolt both Nazi leaders and the German people into a frame of mind in which they might make an organised surrender, as against months or even years of 'underground' resistance to a forced peace.

Berlin, Chemnitz, Leipzig and Dresden were among the cities discussed – all of them rapidly becoming congested with hundreds of thousands of Germans fleeing before the Russian advance, and all of them important links in the German communications network in the east of the country. Harris favoured wiping Berlin off the face of the Reich and simultaneously knocking out several other cities for good measure.

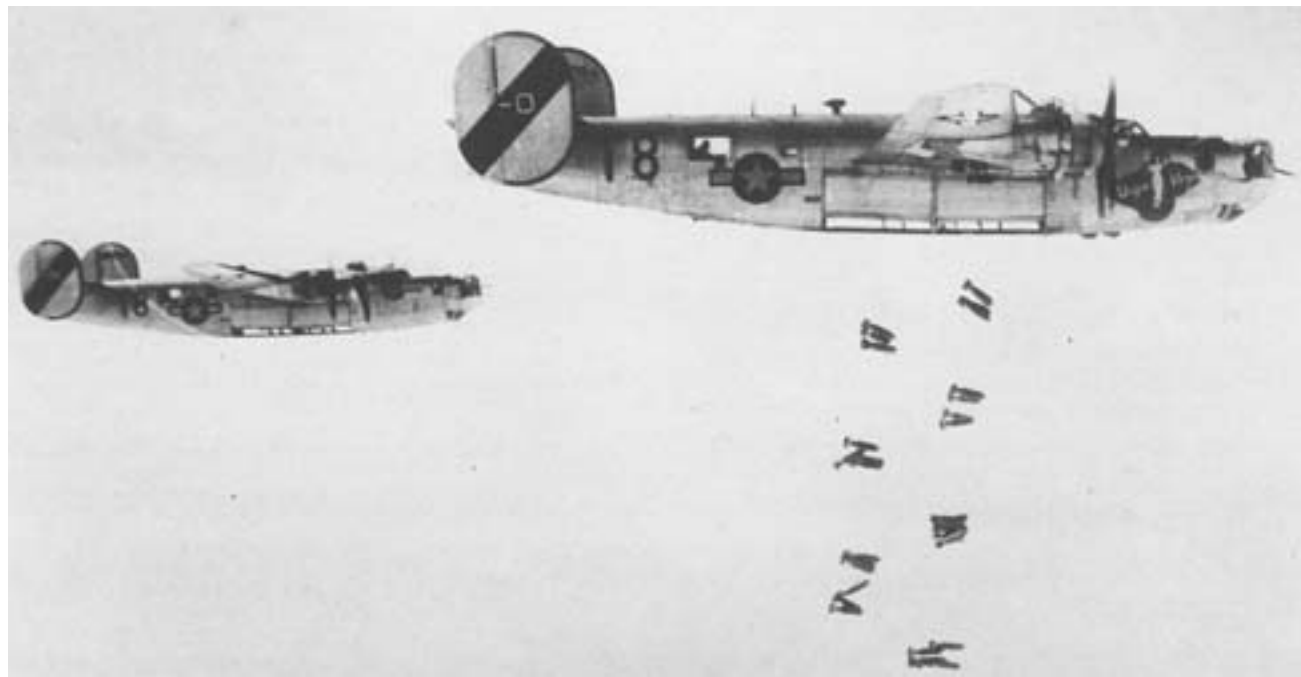
Portal, the Chief of Air Staff, Bottomley his Deputy, Sir Archibald Sinclair, the Secretary of State for Air, and Spaatz the American Air Commander were all involved in two, three, four and five handed discussions on the matter, which became even more frantically confused because Yalta was looming. Churchill wanted to be able to tell Stalin something positive, at the conference of the Grand Alliance, which the Russians were convening at Yalta, about how Western bombing policy would immediately help the advancing Eastern Allies.

On 26th January, Portal (who had been at Churchill's side at Yalta) came out against a really massive attack being made on Berlin, on the grounds that it was too big to be knocked out completely and that the casualties to crews would be unwarrantably heavy. He wanted the highest priority for the continuing oil campaign, plus watered down but moderately heavy attacks on Berlin and other cities Harris had mentioned, or any others considered suitable.

Sinclair, on the same day, addressed a memo to the Prime Minister in which he also favoured the stepping up of the attacks on oil, with the bombing of cities a lesser priority, to be taken up at random when the weather was unsuitable for the oil offensive. Perversely, he kept his foot in the door on 'Thunderclap' without in any way endorsing it, by saying that this was still 'under consideration'.

...and on 27th January Bottomley formally directed Harris to make 'one big attack on Berlin and related attacks on Dresden, Leipzig and Chemnitz...and related cities'

Churchill was far from pleased by the apparent vagueness being shown in the matter and demanded to know within twenty four hours whether Berlin and any other large cities in East Germany were going to be major targets in the near future. This brought matters to a head, and on 27th January Bottomley formally directed Harris to make 'one big attack on Berlin and related attacks on Dresden, Leipzig and Chemnitz...and related cities'.



The Yanks were now tasting blood too often for them to be brought to heel...

Churchill was at once informed of this and a tentative date was pencilled in (weather permitting) of 4th February when the moon would be on the wane. Again, however, there was a certain amount of confusion over priorities, and when Spaatz was called in on the plan, he was also told that oil was still top priority, with some form of 'Thunderclap' second priority.

Characteristically, Europe's wayward weather now proceeded to blow the politicians' plans about a bit. February opened with excellent day bombing conditions and atrocious nights. So it came about that, within hours of the opening of the Yalta conference, the 8th AAF was able to institute an impressive series of fighter escorted heavy bomber raids on Berlin, Leipzig, Magdeburg and Chemnitz, whilst Bomber Command's range was restricted to important but less dramatic attacks on oil, transport, shipping and rocket sites around the north sea coasts. Only a number of day flying Mosquitos were able to

keep the flag flying for Churchill (as he pursued his arguments with Stalin) in attacks on Eastern front targets.

Indeed it was not until the night of 13/14th February that the skies opened up for a major raid in the east, and by this time Dresden was the only 'unmarked' city open to Harris from the list prepared by Bottomley.

As he prepared to press the button for an all out blitz on Dresden, the AOC must have known that even this raid would be too little and too late in relation to the promise of 'Thunderclap'. British and American bombing policies had been thrown out of step by the weather at a vital time. The Yanks were now tasting blood too often for them to be brought to heel, as it were, for a combined raid by more than 4,000 bombers. Harris's belief – inherited from Douhet via Trenchard – that one massive blow from the air, delivered at the right point, could instantly finish war, would never be put to the test in Europe. Only the atom bombing of Japan in due course would seem to bear out the validity of his theory.

The bombing of Dresden that night was nevertheless an act of deliberate fury, aimed at shortening the war. The Germans considered the rococo city safe because of its beauty, and had made it an important communications centre for the Russian front. To Harris it was important also as the largest Reich city still intact. He gave it 'stick' as never before, with firestorms, devastation and death the agony of its fate.

The world was stunned by the magnitude of Bomber Command's attack on Dresden, more so as the city had proved to be undefended...

The world was stunned by the magnitude of Bomber Command's attack on Dresden, more so as the city had

proved to be undefended. Even the atom bombs, shortly to fall on the Japanese, would not equal the devastation nor surpass the death toll achieved in this one 'conventional' raid. But equally Harris and his aircrews felt no guilt over Dresden, as the Americans would apparently feel guilt over Hiroshima and Nagasaki.

The millions who had died in the concentration camps or who had been enslaved by their German conquerors would have raised instant and heartfelt Hosannas to the night's work of Bomber Command and its Old Testament-style leader had they known of it.

The Nazis had Sown the Wind (in Harris's phrase) when they were all powerful. Now they were reaping the Whirlwind. After Dresden the point was reached where all-too-few worthwhile targets remained in the RAF's retributive force. But the Command which had suffered so long and with grievous casualties went on hitting. They had somehow endured the longest continuous battle of the war; they had suffered fears, hardships and slaughter on a scale never before endured by any force of their size. Those who remained considered themselves bloody lucky to be alive at all. Over the years Bomber Command had embraced the sweet flower of a generation of natural leaders. Most had died terrible deaths slamming their young bodies against the Nazi Fortress of Europe. Precision came to Bomber Command all too late, but it allowed the last volunteers to pick off targets in the Spring of 1945 relishing each strike as a blow for a lost friend.

The Nazis had Sown the Wind (in Harris's phrase) when they were all powerful. Now they were reaping the Whirlwind

Those – and this is the view of the official history – who claim that Bomber Command's contribution to the war was less than decisive are factually in error.

That was how it was...

BOMBER COMMAND

Just as the policy and tactics of the bombing war gradually evolved, so did Bomber Command itself. The mighty force available at the end of the war grew from the brave but fragile squadrons that had raided Wilhelmshaven in September 1939. This Chapter will examine Bomber Command at a precise moment during these years – 13/14th February 1945, the day of the Dresden raid.

Bomber Command's front line was a great chain of nearly sixty operational airfields stretching through eastern England from Darlington to Cambridge. About one third of these had been the RAF's pre-war stations with extensive facilities and comfortable accommodation. Postings to these 'Gin Palaces' were much sought after by aircrews. The less fortunate had to make do with the more spartan Nissen huts of the temporary airfields built since the beginning of the war. Sir Arthur Harris at his headquarters near High Wycombe was fifty miles from his nearest bomber station, Gransden Lodge, and over two hundred miles from the Canadian station at Middle-St-George in County Durham. Between Bomber Command headquarters and the operational squadrons were three intermediate levels of Command – Group, Base and Stations; although all major decisions were made by Harris. Rarely has a military commander had such a powerful and flexible force under his own personal control.

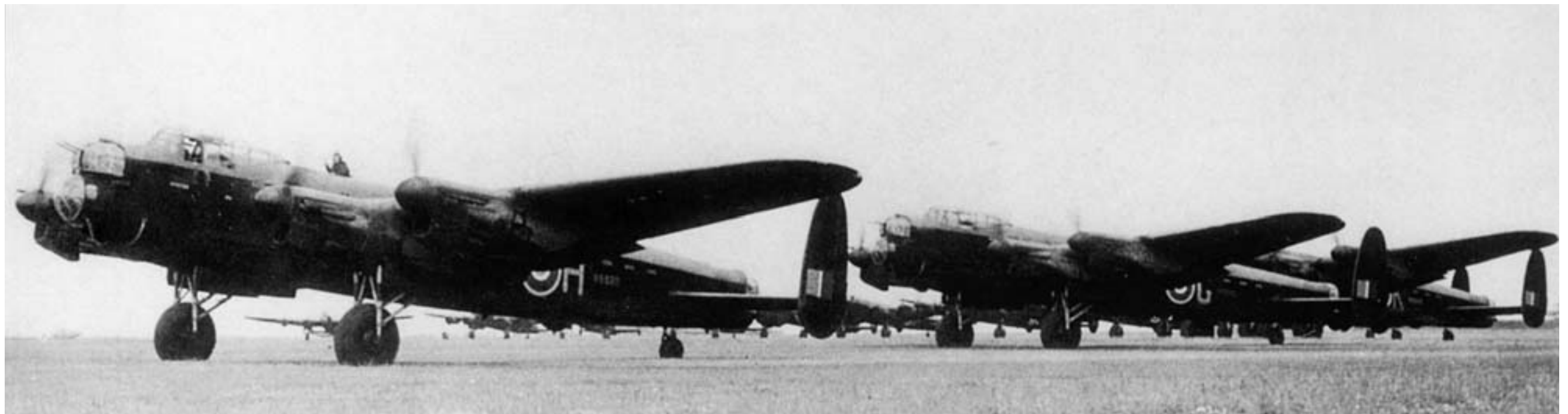
The Group was a long established organisation containing an average of a dozen squadrons ideally all equipped with the same type of aircraft. In February 1945 Bomber Command contained seven operational groups, three training groups and a signals group. The Base was a recent innovation as the Groups had grown in size, this small extra link had been inserted into the chain of command. The Base was commanded by an Air Commodore and was housed on an operational airfield. It controlled the airfield and usually two more. These became unofficially a 'clutch'. The setting up of the Base system was just about complete at this time. The final link in the chain joining the Commander in Chief to his Squadrons was the

The Squadron, led by a Wing Commander, was the basic operational unit. The average bomber station contained either a three flight squadron of thirty bombers...

Station – the permanent organisation on a bomber airfield, commanded by a Group Captain, that provided facilities for the Squadron that operated from there.

The Squadron, led by a Wing Commander, was the basic operational unit. The average bomber station contained either a three flight squadron of thirty bombers or two double-flight squadrons with forty bombers in all.

The seven operational groups were situated in three distinct areas; Yorkshire, Lincolnshire and East Anglia. Together in Yorkshire were two Groups which between them operated all of Bomber Command's remaining Halifax Squadrons. 6 Group, with six airfields in the Vale of York and one just over the border in Durham, was a unique Group in that it was Canadian. Its thirteen Squadrons were all RCAF; its Commander was a Canadian officer and most of the running costs of the Group were met by Canada. In spite of this, 6 Group was fully integrated operationally into Bomber Command.



A close neighbour of the Canadians was 4 Group, based in south and east Yorkshire with nine RAF squadrons, and the Australian 466 Squadron at Leconfield. This was a pre-war Group, the original night bombing Group whose Whitleys had flown to Germany dropping leaflets on the very first nights of the war. Now it was equipped throughout with Halifax aircraft. 4 Group was never one of the glamorous groups with a specialist role of elite Squadrons. It had been tucked away in the north of England since 1939, plodding away at the bombing war, usually operating inferior aircraft and taking higher-than-average losses. It was the workhorse of Bomber Command.

The Group Commander was Air Vice-Marshal Roderick Carr, a New Zealander with a sound reputation.

Coming south, the next bomber area was in Lincolnshire with two large all-Lancaster groups. In the north of the county was 1 Group under Air Vice-Marshal EAB Rice, a South African badly crippled from a first world war leg wound. Rice was a friend and admirer of Sir Arthur Harris. His philosophy and that of his Group was to dispatch the heaviest possible bomb-load as often as possible to Germany.

A Lancaster from No. 617 Squadron.



Next came 5 Group, whose airfields were on the low hills of mid Lincolnshire. If any part of Bomber Command can have said to have had 'glamour' then 5 Group, possibly with the Pathfinders, had this quality

1 Group contained twelve squadrons of which three merit special mention. 101 Squadron at Ludford Magna was the Squadron whose aircraft were fitted with the 'Airborne cigar' (or ABC) radar jamming equipment and its eight man Lancasters were sent on every long raid. For this reason 101 Squadron often operated when their own Group was resting and claimed to have taken part in more bombing raids than any other Bomber Command squadron. 460 Squadron at Binbrook was the senior of the four Australian squadrons in Bomber Command, and 300 (Masovian) was the only Polish squadron in the Command.

Next came 5 Group, whose airfields were on the low hills of mid Lincolnshire. If any part of Bomber Command can have said to have had 'glamour' then 5 Group, possibly with the Pathfinders, had this quality. 5 Group was the first to be equipped with the Lancaster. It had raised and now maintained 617 Squadron of 'dam-busting' fame and, during the course of the war, its airmen were awarded more than half of Bomber Command's VC's. In 1945 it was the largest of the Groups. 5 Group had been commanded by Harris earlier in the war and other commanders felt that he still favoured his old Group. This is possibly so but the reason may be as much that the present commander, Air Vice-Marshal The Hon. Ralph Cochrane, had more to offer than many of his contemporaries. Cochrane was an English officer with a naval background; he had flown



airships with the RNAS in WW1. He was a reserved, austere man who was always trying to improve bomber tactics in general and bombing accuracy in particular. It is certain that both Cochrane and 5 Group made an immense contribution to the bombing war and morale in its squadrons was high. The two Lincolnshire groups could carry a greater tonnage of bombs than the other groups combined.

Situated south of the Fens were the remaining groups, all completely different: 3 Group, 8 Pathfinder Group and 100 (Bomber Support) Group.

3 Group with its airfields around Ely was Lancaster equipped except for 138 and 161 (Special Duty) Squadrons stationed at Tempsford. These two Squadrons flew Resistance agents and supplies as far afield as Norway, Poland and Yugoslavia, sometimes landing in Russia or North Africa after a long flight. They spent so much time over enemy territory that their tour of operations ended at 250 hours if it came before the normal thirty completed trips. 3 Group's commander was a Yorkshireman, Air Vice-Marshal R Harrison. He was older than the other group commanders and was typical of the senior RAF officer who had been promoted steadily since the first war. He was a quiet man, a bachelor and a keen fisherman. He was a respected commander but his influence on the bombing war was confined to running his own Group.

In complete contrast to the quiet Harrison was his close neighbour Air Vice-Marshal DCT Bennett of 8 (Pathfinder) Group, one of the most interesting of the bomber commanders. Donald Bennett, from New South Wales, had served in the RAAF and the RAF from the 1930 to 1935. He then joined Imperial Airways where among other things, he piloted the small flying boat 'Mercury' in the 'Mayo' composite

where a large seaplane took off with a smaller one carried pick-a-back on its upper wing surface. The smaller plane, 'Mercury', could in this manner carry a far greater fuel load than if it had taken off under its own power. Once released from 'Maia' its mother, 'Mercury' had a tremendous range. In 1938 Bennett broke existing records of 4,000 miles by flying this small machine for forty-two hours to cover 6,000 miles with only a wireless operator as a companion. In 1940 he helped to establish the Atlantic Ferry by which American built aircraft were flown to England. In September 1941, he returned to the RAF where he was given the rank of Wing Commander of a Halifax squadron in 4 group. In 1942 he was shot down while attempting to bomb 'Tirpitz' in Norway but he escaped via Sweden.

When the Pathfinder force was formed in late 1942 Harris personally selected Bennett as its commander, resisting pressure to accept a more senior regular officer. When Pathfinder force became 8 Group, Bennett was promoted to Air Vice-Marshal at the age of only thirty two having risen from Wing Commander in just over a year.

Bennett's rapid promotion was not surprising. He was a brilliant navigator and his ability as a pilot, engineer and wireless operator was probably equal to that of any man in his group. Bennett's relations with some of his contemporaries were not good. He believed that not only Pathfinder methods, but all navigation and routing recommendations also should be accepted by others without question. He called those group commanders who opposed his views 'the unruly Barons of Bomber Command'. In turn they found it difficult to work with this brash young officer who had been appointed by Harris to the most interesting job in Bomber Command.

The last Bomber Command group to be formed was 100 (Bomber Support) Group stationed in Norfolk

Such clashes of personality are not unusual in time of war and there is no evidence that the relationships ever became petty or spiteful. Bennett and Cochrane were often in conflict over tactics. On the other hand Carr, Bennett's old commander in 4 Group, thought Bennett 'a brilliant man who I always backed'. Few were neutral where Bennett was concerned but of one thing there was no doubt – he had the complete and absolute confidence of the crews. They may have found him intolerant and hard to please but, because of his ability as an aviator and his powers of leadership, they followed him without question.

The last Bomber Command group to be formed was 100 (Bomber Support) Group stationed in Norfolk. The successes of the German night fighters in 1943 had led to the creation of a number of units whose task it was to support the bombers in various ways. In November of that year these units had been collected into a new group whose sole object was to help the bombing force. Its Commander was Air Commodore (later Air Vice-Marshal) EB Addison, an expert in signals and radio-countermeasures. 100 Group was to do great things in the last year of the war. It was equipped with 'Serrate' Mosquito squadrons, low level intruder Mosquitoes and Fortress aircraft for Radar jamming.

This then is Bomber Command on the eve of the attack on Dresden, seven Groups, nearly eighty squadrons and about 1,000 aircraft. Morale was high and there was no shortage of



crews. By this time there were hardly any pre-war Regulars still flying with Bomber squadrons – and as Bennett was heard to remark 'The Gentlemen have had their turn, now it is up to the Players'.

It might also be recalled that at this time any 'Player' over the age of twenty two was considered to be 'Getting On'.

ORDER OF BATTLE

RAF Bomber Command
13/14 February 1945

No.1 Group

(Air Vice-Marshal EAB Rice H.Q. Bawtry Hall)

SQUADRON	STATION	AIRCRAFT
12 Squadron	Wickenby	Lancaster
100 “	Elmsham Wolds	“
101 “	Ludford Magna	“
103 “	Elmsham Wolds	“
150 “	Hemswell	“
153 “	Scampton	“
166 “	Kirmington	“
170 “	Hemswell	“
550 “	North Killingholme	“
576 “	Fiskerton	“
625 “	Kelstern	“
626 “	Wickenby	“
300 (Polish)	Faldingworth	“
460 (RAAF)	Binbrook	“

No. 3 Group

(Air Vice-Marshal R Harrison)
H.Q. Exning, Newmarket

SQUADRON	STATION	AIRCRAFT
15 Squadron	Mildenhall	Lancaster
75 “	Mepal	“
90 “	Tuddenham	“
115 “	Witchford	“
138 “	Tuddenham	“
149 “	Methwold	“
186 “	Stradishall	“
195 “	Wratting Common	“
218 “	Chedburgh	“
514 “	Waterbeach	“
622 “	Mildenhall	“

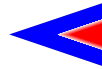


No. 4 Group
(Air Vice-Marshal CR Carr)
H.Q. Heslington Hall, York

SQUADRON	STATION	AIRCRAFT
10 Squadron	Melbourne	Halifax
51 “	Leconfield	“
466 “	Driffield	“
76 “	Holme	“
77 “	Full Sutton	“
78 “	Brighton	“
102 “	Pocklington	“
158 “	Lissett	“
640 “	Leconfield	“
346 “	Elvington	“
347 “	Elvington	“

No. 5 Group
(Air Vice-Marshal The Hon. Ralph Cochrane)
H.Q. Morton Hall, Swinderby

SQUADRON	STATION	AIRCRAFT
9 Squadron	Bardney	Lancaster
44 “	Spilsby	“
49 “	Fulbeck	“
50 “	Skellingthorpe	“
57 “	East Kirkby	“
61 “	Skellingthorpe	“
106 “	Metherringham	“
189 “	Bardney	“
207 “	Spilsby	“
227 “	Strubby	“
617 “	Woodhall Spa	“
619 “	Strubby	“
630 “	East Kirkby	“
83 “	Coningsby	“
97 “	Coningsby	“
627 “	Woodhall Spa	Mosquito
463 RAAF Squadron	Waddington	Lancaster
467 ”	”	”

**No. 6 Group****(Canadian)****(Air Vice-Marshal CM McEwen)****H.Q. Allerton Park Castle, Knaresborough)**

SQUADRON	STATION	AIRCRAFT
408 (Goose) Squadron	Linton-on-Ouse	Halifax
415 (Swordfish) “	East Moor	“
419 (Moose) “	Middleton St. George	“
420 (Snowy Owl) “	Tholthorpe	“
424 (Tiger) “	Skipton-on-Swale	Lancaster
425 (Alouette) “	Tholthorpe	Halifax
426 (Thunderbird)	Linton-on-Ouse	“
427 (Lion) “	Leeming	Lancaster
428 (Ghost) “	Middleton St. George	“
429 (Bison) “	Leeming	“
431 (Iroquois) “	Croft	“
432 (Leaside) “	East Moor	Halifax
433 (Porcupine) “	Skipton-on-Swale	Lancaster
434 (Bluenose) “	Croft	“

No. 8 Group (Pathfinder)**(Air Vice-Marshal DCT Bennett)****H.Q. Allerton Park Castle, Knaresborough**

SQUADRON	STATION	AIRCRAFT
7 Squadron	Oakington	Lancaster
35 “	Gravelly	“
105 “	Bourne	Mosquito
109 “	Little Staughton	“
128 “	Wyton	“
139 “	Upwood	“
142 “	Gransden Lodge	Lancaster
156 “	Upwood	Lancaster
162 “	Bourne	Mosquito
163 “	Wyton	“
405 RCAF Squadron	Gransden Lodge	Lancaster
571 “	Oakington	Mosquito
582 “	Little Staughton	Lancaster
608 “	Downham Market	Mosquito
635 “	Downham Market	Lancaster
692 “	Gravelly	Mosquito



No. 100 Group (Bomber Support)
(Air Vice-Marshal EB Addison)

H.Q. Bylaugh Hall, East Dereham

SQUADRON	STATION	AIRCRAFT
23 Squadron	Little Snoring	Mosquito
85 “	Swannington	“
141 “	West Raynham	“
157 “	Swannington	“
169 “	Great Massingham	“
171 “	North Creake	Halifax
192 “	Foulsham	“
199 “	North Creake	“
214 “	Oulton	Halifax/Stirling
223 “	Oulton	Fortress 111
239 “	West Raynham	Mosquito
462 “RAAF Squadron	Foulsham	Halifax
515 “	Little Snoring	Mosquito



Sir Robert Saundby

**AIR MARSHAL SIR
ROBERT SAUNDBY**

**Deputy A.O.C-in-C. Bomber
Command**
**K.C.B., K.B.E., M.C., D.F.C.,
A.F.C.**

When asked to comment on the attack on Dresden, my first reaction was that I had been too closely concerned and I was not in any way responsible for the decision to make a full-scale air attack on Dresden. Nor was my Commander-in-Chief, Sir Arthur Harris. Our part was to carry out,

to the best of our ability, the instructions we received from the Air Ministry. And, in this case, the Air Ministry was merely passing on instructions received from those responsible for the higher direction of the war.

The story is a highly dramatic and complex one, which still holds an element of mystery. I am still not satisfied that I fully understand why it happened. That the bombing of Dresden was a great tragedy, no one can deny. It was one of those terrible things that sometimes happen in wartime, brought about by an unfortunate combination of circumstances. Those

The advocates of nuclear disarmament seem to believe that if they could achieve their aim, war would become tolerable and decent. They would do well to ponder the fate of Dresden, where 135,000 people died as a result of an air attack with conventional weapons

who approved it were neither wicked nor cruel, though it may well be that they were too remote from the harsh realities of war to understand fully the appalling destructive power of air bombardment in the spring of 1945.

The advocates of nuclear disarmament seem to believe that if they could achieve their aim, war would become tolerable and decent. They would do well to ponder the fate of Dresden, where 135,000 people died as a result of an air attack with conventional weapons. On the night of March 9/10 1945, an air attack on Tokyo by American heavy bombers using incendiaries and high explosive bombs, caused the death of 83,793 people. The atom bomb dropped on Hiroshima killed 71,379 people.

Nuclear weapons are of course, far more powerful nowadays, but it is a mistake to suppose that, if they were abolished, great cities could not be reduced to dust and ashes, and frightful massacres brought about by aircraft using conventional weapons. And the removal of the fear of nuclear retaliation – which makes modern full-scale war amount to mutual annihilation – might once again make resort to war attractive to an aggressor.

It is not so much this or the other means of making war that is immoral or inhuman. What is immoral is war itself. Once full-scale war has broken out it can never be humanised or civilised, and if one side attempts to do so it would be most likely to be defeated. So long as we resort to war to settle differences between nations, so long we will have to endure the horrors, barbarities and excesses that war brings with it. That to me is the lesson of Dresden.

Nuclear power has at last brought us within sight of the end of full-scale war. It is now too violent to be a practical means of

solving anything. No war aim, no conceivable gain that war could bring, would be worth a straw when balanced against the fearful destruction and loss of life that would be suffered by both sides.



There has never been the slightest hope of abolishing war by agreement or disarmament, or for reasons of morality and humanity. If it disappears it will be because it has become so appallingly destructive that it can no longer serve any useful purpose. Let us hope that the horrors of Dresden, Tokyo, Hiroshima and Hamburg, may drive home to the whole human race the futility, savagery, and utter uselessness of modern war.

We must not make the fatal mistake, however, of believing that war can be avoided by unilateral disarmament, by resort to pacifism, or by striving for an unattainable neutrality. It is the balance of nuclear power that will keep the peace until mankind, as some day it must, comes to its senses.

IRA C. EAKER, LT. GEN. U.S.A.F. (RET.)



Ira C Eaker

Our Fortresses and Liberators had been designed for day bombing. They flew in close formation for support, and the bombardiers could find and hit vital targets...

It may not be inappropriate that I undertake to comment on the attack on Dresden since I was the first U.S. Army Air Corps bomber commander

in Europe in the last war, and later commanded the Eighth Air Force in England from October 1942 until January 1944. In these capacities I worked closely with the principal British and

U.S. commanders, who directed and carried out the bombing raids on German targets, including Dresden. I well remember the target directives and bombing policies.

The bombing policy, like all major military decisions, was agreed by the heads of Allied Governments – President Roosevelt, Prime Minister Churchill, and Marshal Stalin – upon the advice of their military Chiefs of Staffs. When I first arrived in England in 1942 to command our bomber groups and to organise, in close co-operation with British Bomber Command, for the combined air offensive, all directives from the heads of state and Combined Chiefs of Staff were channelled through Air Chief Marshal Portal, Chief of Air Staff of the Royal Air Force. It was fully understood and agreed by all hands that the British night bombing effort, approved and then in progress, was thereafter to be supplemented by United States daylight bombing against important enemy munitions targets, submarine pens, airplane and tank factories, and, later, petroleum production and transportation. This was confirmed at the Casablanca conference.

This combined United States – British bombing offensive made necessary for the Germans greatly to augment their defences, to stand watch around the clock. This effort kept thousands of workers from the munitions labour force and greatly reduced the number of divisions which the Germans could send to the Eastern Front. At one time more than half a million Germans were involved day and night defending themselves against our air offensive.

Our Fortresses and Liberators had been designed for day bombing. They flew in close formation for support, and the bombardiers could find and hit vital targets like munitions factories. However, the weather often obscured targets. Radar



was then developed and employed for target identification through cloud cover. This method never produced the accuracy of visual bombing, and it is understandable why the Germans charged us with indiscriminate area bombing.

Also, vital enemy targets were located in and near centres of population. It was clear to us all that many civilians would be killed or rendered homeless when such targets were attacked. We never permitted this factor to spare a vital target. I did not believe then, and do not believe now, that a factory turning out 'planes, bombs, tanks, submarines or guns should be spared to prevent hazard to enemy civil populations, particularly civilians working in those plants turning out munitions later to be hurled at our gallant soldiers, sailors and airmen. A skilled worker in a German munitions factory was contributing to our casualties just as certain as enemies in uniform. It was our directive and duty to bring the war to successful conclusion as quickly as possible.

The enemy would be defeated when he had lost the will to fight; our bombing was directed toward that end.

I find it difficult to understand Englishmen or Americans who weep about enemy civilians who were killed but who have not shed a tear for our gallant crews lost in combat...

The heads of the Allied governments, their Chiefs of Staff, and the senior commanders in the field were not fiends or barbarians who relished the taking of human lives. I knew these men well. I admired and respected their habits, characters and their complete dedication to their military assignments, their countries and their peoples. I find it difficult

to understand Englishmen or Americans who weep about enemy civilians who were killed but who have not shed a tear for our gallant crews lost in combat with a cruel enemy. It is well to remember at this very time, V-1s and V-2s were falling on England, killing civilian men, women and children indiscriminately, as they were designed and launched to do. It might be well to remember Buchenwald and Coventry, too.

Worries exist about whether Dresden was a proper military target. The same argument, strangely enough, is popular now. Our Air Leaders today advocate a 'counterforce' air strategy. All military airmen generally believe that our weapons should be designed and produced in sufficient quantities to destroy





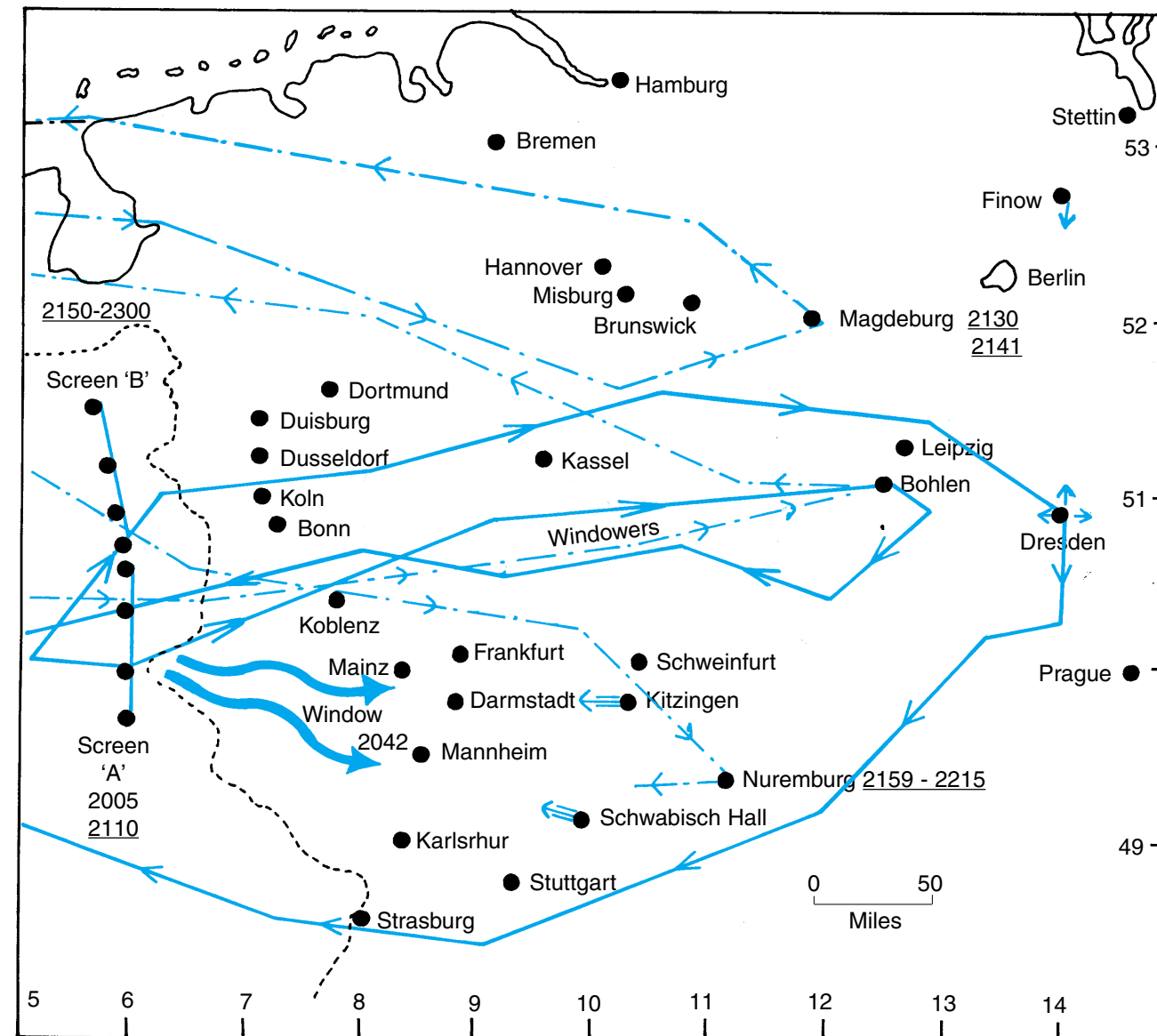
112

the enemy's warmaking potential, not his cities.

Nevertheless, some people advocate that we need only sufficient nuclear weapons to destroy the enemy's great centres of population. By a strange coincidence, those who now lead in condemning the bombing of civilians in the last war appear to be the 'fail safe' crowd who would now give us only enough weapons in the future for the destruction of enemy cities.

I deeply regret that British and American bombers killed 135,000 people in the attack on Dresden, but I remember who started the last war and I regret even more the loss of more than 5,000,000 Allied lives in the necessary effort to completely defeat and utterly destroy Nazism.

FIRST PHASE

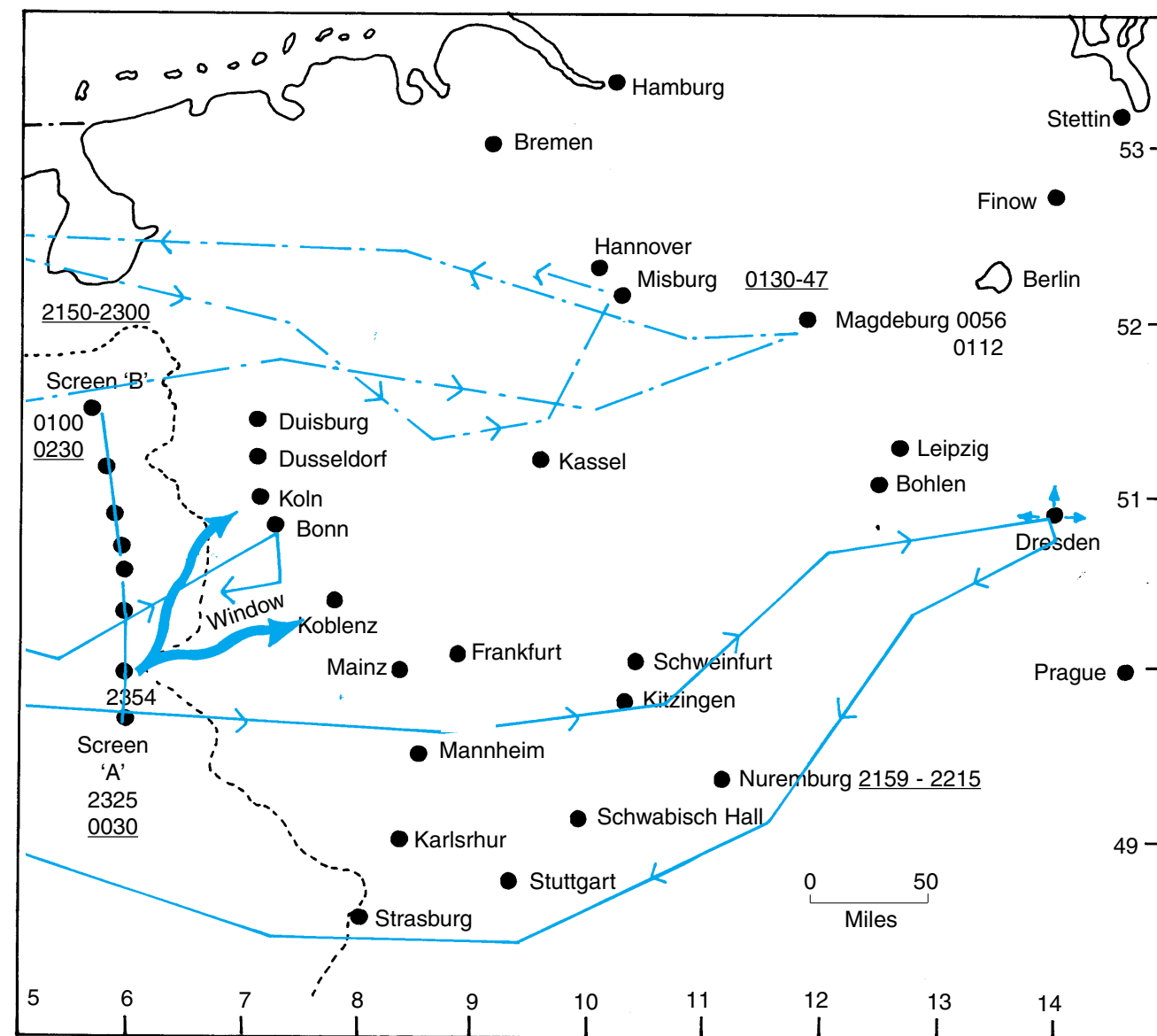


COMBINED BOMBER COMMAND OPERATIONS NIGHT 13/14th Feb.1945

The map does not portray the route of the Low Level Intruders over the airfields at Dortmund, Kassel and Gutersloh. Neither does it portray the High Level Intruders operating in the South. These aircraft gave greater credibility to the Window Feint Force.



SECOND PHASE



COMBINED BOMBER COMMAND OPERATIONS NIGHT 13/14th Feb.1945

The Bonn Feint and the Window Feint Force breaking through the Mandrel Screen gave the impression that the target was well North, and covered the more Southerly route of the Main Force.

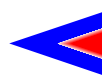
SECRET

FROM HQ NO. 1 GROUP 131515A
TO 12, 13, 14, 15, BASES AND ALL OPS STATIONS.
INFO 71 BASE AND HQBC.

SECRET QQX BT

- A. FORM B SERIAL NO. 1649. TASK NO. 1762.
- B. 13TH FEBRUARY 1945
- C. SEE CURRENT INTELLIGENCE SIGNAL. A TOTAL OF 500 LANCASTERS PLUS PFF WILL BE ATTACKING THIS TARGET.
- D. TO DESTROY BUILT UP AREA AND ASSOCIATED INDUSTRIES AND RAIL FACILITIES.
- E. NIGHT 13/14 FEBRUARY 1945
- F.

12BASE	53 A/C
13 BASE	71 A/C
14 BASE	66 A/C
15 BASE	<u>63 A/C</u>
TOTAL	<u>253 A/C</u>
- G. “CHEVIN” AIMING POINT “CHEVIN” – ‘A’
- H.1 AND H.2 NIL
- J. RESULT OF THE RAID WITH THE AID OF PILOTS REPORTS PHOTOGRAPHS AND H2S PHOTOGRAPHS. ALL AIRCRAFT TO CARRY PHOTO-FLASHES, AND AS MANY AS POSSIBLE TO CARRY H2S CAMERAS.
- K. AND L
- (A) BASES – (B) READING – (C) 50.00N/02.00E – (D) 49.45N/09.05E –
 - (E) 49.55N/09.05E – (F) 50.50N/12.00E – TARGET – (G) 50.55/13.55E
 - (H) 50.30N/12.40E – (I) 49.15N/11.30E – (J) 48.30N/09.20E – (K) 48.30N/07.10E –
 - (L) 49.00N/05.00E – (M) ORFORDNESS – (A) BASES.
- M.1. “H” HOUR WILL BE 01.30 HOURS.



116

<u>M.2. (A) 1ST WAVE</u>		
12 BASE	11	A/C
13 BASE	13	A/C
14 BASE	5	A/C
15 BASE	<u>11</u>	<u>A/C</u>
	<u>40</u>	<u>A/C</u>
<u>2ND WAVE</u>		
12 BASE	14	A/C
13 BASE	15	A/C
14 BASE	7	A/C
15 BASE	<u>14</u>	<u>A/C</u>
	<u>50</u>	<u>A/C</u>
<u>3RD WAVE</u>		
12 BASE	15	A/C
13 BASE	19	A/C
14 BASE	9	A/C
15 BASE	15	A/C
<u>4TH WAVE</u>		
12 BASE	14	A/C
13 BASE	15	A/C
14 BASE	7	A/C
15 BASE	<u>14</u>	<u>A/C</u>
	<u>50</u>	<u>A/C</u>
<u>5TH WAVE</u>		
12 BASE	9	A/C
13 BASE	9	A/C
14 BASE	3	A/C
15 BASE	<u>9</u>	<u>A/C</u>
	<u>30</u>	<u>A/C</u>

<u>TIME ON TARGET “H” TO “H” PLUS 3</u>	
PLUS 30 LANCS OF 3 GROUP AND 37 LANCS OF 6 GROUP	
<u>T.O.T “H” PLUS 3 TO “H” PLUS 6</u>	
PLUS 40 LANCS OF 3 GROUP	
<u>T.O.T “H” PLUS 6 TO “H” PLUS 9</u>	
PLUS 30 LANCS OF 3 GROUP	
<u>T.O.T “H” PLUS 9 TO “H” PLUS 12</u>	
PLUS 40 LANCS OF 3 GROUP	
<u>T.O.T “H” PLUS 12 TO “H” PLUS 15</u>	
PLUS 30 LANCS OF 3 GROUP AND 30 LANCS OF 6 GROUP	
LANCS OF 6 GROUP	



(B) SUPPORTERS T.O.T “H” MINUS 6 / MINUTES

14 BASE – 16 A/C OF 12 SQUADRON PLUS 4 A/C OF 626 SQUADRON.

(C) 15 A.B.C. AIRCRAFT OF 101 SQUADRON ARE TO BE SPREAD EVENLY THROUGHOUT THE WHOLE ATTACK

N.1. MINIMUM PETROL LOAD FOR ALL AIRCRAFT TO BE 2154 GALLONS.

N.2. BOMB LOADS (MAIN FORCE)

(A) 50% OF MAIN FORCE AIRCRAFT ARE TO CARRY FOR PREFERENCE

(1) 1 X 4,000LB H.C.
10 X 500 X 4LB I.B. CLUSTERS
2 X 60 X 4LB I.B. CLUSTERS

OR (2) 1 X 4,000LB H.C.
PLUS A PROPORTION OF 500 AND 750LB CLUSTERS
2 X 60 X 4LB I.B.

OR (3) 1 X 4,000LB H.C.
7 X 150 X 4LB I.B.

(B) 50% OF AIRCRAFT ARE TO CARRY FOR PREFERENCE

(1) 1 X 2,000LB H.C.
14 X 500 X 4LB I.B. CLUSTERS

OR (2) 1 X 2,000LB H.C.
PLUS A PROPORTION OF 750 AND 500LB CLUSTERS

OR (3) 1 X 2,000LB H.C.
11 X 150 X 4LB I.B.

(C) IN ALL CASES 10% I.B’S TO BE “X” TYPE

SUPPORTERS TO CARRY AN H.E. LOAD

1 X 4,000LB H.C.
9 X 500LB M.C. OR G.P. FUSED TO 0.25 SECONDS

N.3. DISTRIBUTOR SETTINGS

CLUSTER LOADS = 0.1 SECONDS
S.B.C. LOADS = 0.2 SECONDS
H.E. LOADS = 0.25 SECONDS

N.4. SECURITY

SIGNALS AND RADAR SILENCE (INCLUDING ABC AND H2S) IS TO BE MAINTAINED AS FAR AS 06.00E ON THE OUTWARD JOURNEY.

N.5. NAVIGATION LIGHTS

ARE TO BE BURNED AS FAR AS 06.00E ON THE OUTWARD JOURNEY.

N.6. SUPPORTERS

SUPPORTERS MUST MAKE EVERY ENDEAVOUR TO BOMB AT "H" MINUS 6 1/2 MINUTES. THEY ARE TO BOMB BETWEEN 18/20,000 FT USING BEST NAVIGATIONAL AIDS AVAILABLE, SINCE NO MARKERS SHOULD BE VISIBLE AT THIS TIME. ABOVE ALL THEY ARE TO BOMB EXACTLY AT "H" MINUS 6 1/2 MINUTES.

N.6. WINDOW

(A) 50% OF AIRCRAFT TO CARRY AND DROP "M" TYPE WINDOW (ONE THIRD OF THIS NUMBER "MB") AS FOLLOWS

START RATE "D" = 49.52N/06.00E

START RATE "G" = 51.00N/13.19E

START RATE "D" = 50.48N/13.35E

STOP FINALLY = 49.55N/04.00E

CORRECTION

ALL AFTER START RATE "D"

STOP FINALLY = 49.55N/04.00E

A TOTAL OF 550 BUNDLES PER AIRCRAFT

(B) 50% OF AIRCRAFT ARE TO CARRY ORDINARY TYPE WINDOW AS FOLLOWS

START RATE "D" = 49.52N/06.00E

START RATE "G" = 51.00N/13.19E

START RATE "D" = 50.48N/13.35E

STOP FINALLY = 49.55N/04.00E

A TOTAL OF 590 BUNDLES PER AIRCRAFT

(C) ALL AIRCRAFT ARE TO CARRY AN ADDITIONAL 24 BUNDLES OF ORDINARY TYPE WINDOW FOR USE IF ENGAGED BY HEAVY PREDICTED FLAK.



N.7. THE IMPORTANCE OF ACCURATE TIMING IS TO BE PARTICULARLY STRESSED AND AIRCRAFT ARE NOT TO SET COURSE FROM THE RENDEZVOUS POSITION 06.00E BEFORE THEIR CONCENTRATION TIME. FREQUENT TIME CHECKS ARE TO BE MADE BEFORE REACHING THIS POINT AND PARTICULARLY AT READING AND POSITION 02.00E.

N.8. WIND BROADCASTING

8 AIRCRAFT FROM EACH BASE ARE TO BE DETAILED TO ACT AS WINDFINDERS. THESE AIRCRAFT ARE TO TRANSMIT TO THIS H.Q. WIND VELOCITIES FOUND. FURTHER INSTRUCTIONS WILL BE PASSED BY TELEPHONE BY THE DUTY NAVIGATION OFFICER.

N.9. OTHER GROUPS

3 GROUP – “CHEVIN” = 01.30 HOURS – 170 LANCS

6 GROUP – “CHEVIN” = 01.30 HOURS – 67 LANCS

ROUTES AS FOR NO.1 GROUP

5 GROUP – “CHEVIN” = 22.15 HOURS – 200 LANCS

ROUTE – BASES – READING – 50.00N/02.00E – 50.00N/05.00E – 51.00N/06.00E –

51.10N/08.00E – 51.43N/10.20E – 51.35N/12.40E – TARGET

50.55N/13.55E – 50.25N/13.55E – 50.30N/13.10E – 49.55N/11.50E

48.25N/09.00E – 48.30N/07.10E – 49.00N/05.00E – ORFORDNESS – BASES

4 GROUP – GQ1514A – 22.00 HOURS – 200 HALIFAX

6 GROUP – GQ1514A – 22.00 HOURS – 115 HALIFAX

8 GROUP WHITEBAIT MOSQUITOS

N.10. METHOD

(A) THE METHOD FOR TONIGHT WILL BE CONTROLLED NEWHAVEN WITH EMERGENCY WANGANUI.

(B) PFF AIRCRAFT WILL OPEN THE ATTACK WITH LONG STICKS OF ILLUMINATING FLARES AT “H” MINUS 6. THE AIMING POINT WILL THEN BE MARKED WITH LARGE SALVOES OF MIXED RED AND GREEN T.I’S AND WILL BE KEPT MARKED WITH RED T.I’S. IF AIMING POINT IS NOT MARKED VISUALLY THE TARGET AREA WILL BE MARKED WITH GREEN T.I’S IN THE EARLY PART OF THE ATTACK.

(C) IF GROUND MARKING IS OBSCURED BY CLOUD THE RELEASE POINT WILL BE FMARKED WITH SKY MARKING FLARES RED/GREEN STARS IGNITING AT 15,000FT.

(D) A MASTER BOMBER WILL GIVE AIMING INSTRUCTIONS TO THE MAIN FORCE WHO ARE TO LISTEN OUT FROM "H" MINUS 15 MINUTES
 MASTER BOMBER "KINGCOLE"
 DEPUTY MASTER "KINGCOLE TWO"
 MAINFORCE "STRONGMAN"
 FREQUENCIES (1) VHF BOMBER COMMON
 (2) 6440 KC/S
 (3) 5865 KC/S

(E) MAINFORCE ARE TO AIM THEIR BOMBS IN THE FOLLOWING ORDER OF PREFERENCE.

(A) MASTER BOMBERS INSTRUCTIONS.

(B) CENTRE OF MIXED RED AND GREEN T.I'S.

(C) CENTRE OF RED T.I'S.

(D) CENTRE OF GREEN T.I'S.

(E) CENTRE OF SKYMARKING FLARES RED/GREEN STARS ON THE EXACT HEADING OF 069 DEGREES TRUE/073 DEGREES MAGNETIC.

N.11. INTRUDERS

IN THE EVENT OF INTRUDER ACTIVITY AIRCRAFT ARE TO FLY WEST FOR TEN MINUTES AND THEN SOUTHWEST UNTIL EITHER RECALLED OR DIVERTED.

TACTICS

(A) RENDEZVOUS AT READING AT 8/10,000 FT AND CONTINUE AT THIS HEIGHT AS FAR AS 01.30 DEGREES EAST ON TRACK

(B) THEN CLIMB TO BE AT 12/14,000 FT BY 03.00E ON TRACK

(C) MAINTAIN THIS HEIGHT TO 06.00E ON TRACK

(D) THEN CLIMB TO BOMBING HEIGHT 16/20,000 FT BY 09.05E

(E) MAINTAIN THIS HEIGHT FOR BOMBING AND AS FAR AS 05.00E ON THE RETURN JOURNEY

(F) THEN LOSE HEIGHT KEEPING ABOVE CLOUD SO AS TO CROSS CONTINENTAL COAST OUT AT 6/10,000 FT

(G) MAINTAIN THIS HEIGHT TO THE ENGLISH COAST THEN LOSE HEIGHT GRADUALLY TO BASE AREAS

O. ACKNOWLEDGE

P. 131515A

SECRET
APPENDIX 46

To F.540 of No. 1 Group
For February 1945

No. 1 Group summary of Operations, Night 13/14 February 1945

Target Dresden

Detailed	265	Lancasters (Including one 5 Group Photographic Aircraft)
Took-off	261	“
Successful “A”	244	“
Successful “B”	1	“
Abortive NOET	10	“
Missing	4	“
Outstanding	2	“

Successful “A” Time on Target 0123 to 0152 hours, 14,000 to 20,000 ft.

Weather on route was clear until approximately three degrees East, where a front was passed with cloud tops at 16,000 feet. From this point until twelve degrees East there were large areas of broken cloud with tops of from 12 to 18,000 feet. Here the cloud dispersed entirely and conditions were again clear when the target was reached, although there was a thick bank of cloud with tops to 8,000 feet just to the East.

Crews report that the result of 5 Group’s attack were visible twenty minutes flying time from the target, and supporting aircraft bombing before the main attack commenced, reported that the fires by 5 Group were still burning well and that the

main concentration was situated in the area South of the River Elbe between the marshalling yards and our aiming point with a few smaller fires burning to the North. The marking commenced punctually with illuminating flares which were reported as being hardly necessary as the built up area was clearly visible in the light of the fires. Green T.I’s were dropped and at the commencement the Master Bomber’s instructions were to overshoot these markers by two seconds. Later the Master Bomber instructed crews to bomb the Red T.I’s which had been dropped in the centre of the fires. Towards the end of the attack the fires had reached such intensity that it became difficult to distinguish markers, and the Controller’s final instructions which were given from 01.42 hrs onwards, were to bomb the centre of the fires. By the end of the attack the whole built up area to the South of the river was a mass of fires with another smaller area to the North. There are only a few reports of incendiaries being dropped short. Among several explosions a particularly impressive one at 01.37 hrs is reported. All reports indicate a most successful attack and some crews compare it favourably with the one on Nuremburg on the night of 2nd/3rd January. The results of the attack were clearly visible for over 100 miles on the return journey.

Ground defences were very weak with only a small amount of heavy flak and no searchlights. One aircraft sustained damage from heavy flak in the target area and three other aircraft which strayed off track on return sustained damage from the heavy flak, one at Ausburg, one at Nuremburg and a third at Stuttgart. There was little evidence of enemy night fighter activity and only three of our aircraft were engaged in combat, one with a single-engined aircraft in the target area which did not return fire, one with a JU88 near Nordlingen on return and



122

the third with an ME 410 SW of Stuttgart. In each of the two latter our aircraft claimed strikes on the enemy aircraft, which returned fire. No damage was sustained by our aircraft. In combat with the JU.88 the pilot momentarily lost control of our aircraft and gave orders to abandon. Before he could gain control the Mid Upper Gunner had baled out.

The 244 aircraft claiming to have attacked the primary target dropped: –

73 x 4,000lb H.C.	460 x No. 14 Clusters
69 x 4,000lb Minel 2	61 x No. 14 “X” type Clusters
100 x 2,000lb H.C.	12 x No. 15 Clusters
46 x 500lb M.C.	1502 x 150 x 4lb Incendiaries (including 28,200 x 4lb “X” type)
62 x 500lb G.P.	244 x 60 x 4lb Incendiaries

In addition the four missing aircraft carried: –

1 x 4,000lb H.C.	2 x 4,000lb M2
1 x 4,000lb H.C.	22 x No. 14 Clusters
2 x No. 14 “X” type clusters	14 x 150 x 4lb Incendiaries (including 267 x 4 “X” type)

Making a total of: –

74 x 4,000lb H.C.	571 x 140 Clusters
71 x 4,000lb M2	63 x No. 14 “X” type Clusters
101 x 2,000lb H.C.	12 x No. 15 Clusters
46 x 500lb M.C.	1527 x 150 x 4lb Incendiaries (including 28,467 x 4lb incends)
62 x 500lb G.P.	250 x 60 x 4lb

Successful “B”

One aircraft with engine trouble attacked TRABEN TRABACH Northeast of TRIER, dropping :– 1 x 2,000lb H.C., 11 x 150 x 4lb incendiaries including 165 x 4 “X” Type.

Missing

- | | |
|-------------|---|
| 1. 103/“O” | P/O Rimmington (3) 5 th Wave |
| 2. 101/“J” | F/O Davis (9) A.B.C. |
| 3. 626/“D2” | F/O Driver (8) 1 st Wave |
| 4. 576/“O2” | F/O Young (8) 4 th Wave |

Nothing was heard from these aircraft after take-off.

Aborted Not over Enemy Territory

- | | |
|--|---|
| 1. 625/“B” Engine Trouble. | 2. 625/“K” Rear Turret U.S. |
| 3. 626/“H2” Engine Trouble. | 4. 166/“R2” Flight Instruments U/S. |
| 5. 550/“C2” Rear Gunner ill. | 6. 626/“W2” Pilot ill |
| 7. 150/“S” Engine Trouble. | 8. 550/“B2” Collided with No. 9 shortly after take-off. |
| 9. 300/“W” Collided with No. 8 shortly after take-off. | |
| 10. 576/“C” A.S.I. U/S. | |

Outstanding

- | |
|--|
| 1. 100/“B” Landed at Juvincourt. These a/c 2 x 2,000lb H.C.
25 x No. 14 Clusters. |
| 2. 576/“X2 Landed at Juvincourt. These a/c 3 x No. 14 “X”
type Clusters. |

SECRET

FORM 540 OPERATIONS RECORD BOOK

H.Q. No.3 Group

Exning 13/14 February 1945.

Target Dresden

Detailed:– 168 Sorties:– Cancelled:– 6. Abortive:– 7.
Missing:– 1.

The attack was carried out in the direct support of the Russian offensive and seemed to have been highly successful. The weather in the target area was clear. Although the T.I.'s appeared scattered at first, the Master Bomber soon got the bombing concentrated, and when the attack was finished, the town appeared to be well and truly ablaze, and smoke was rising to considerable heights. There were no searchlights and Flak was slight. Crews were enthusiastic regarding the results. This was the first night on which Dresden had been attacked in force by Bomber Command. It was attacked two hours earlier by other Groups, the fires from which were visible when our crews arrived.

The low losses are due probably to the tactics used and the excellent support given by the Bomber Support Group.

SECRET

FORM 540 OPERATIONS RECORD BOOK

H.Q. No.4 Group

Heslington Hall
13/14 February 1945

Attack on Target "A"

Bohlen

23 aircraft of 10 Squadron Melbourne, 15 aircraft of 51 Squadron Snaith, 23 aircraft of 76 Squadron Holme, 21 aircraft of 77 Squadron Full Sutton, 23 aircraft of 78 Squadron Brighton, 17 aircraft of 102 Squadron Pocklington, 22 aircraft of 158 Squadron Lissett, 14 aircraft of 346 Squadron Elvington, 12 aircraft of 347 Squadron Elvington, 15 aircraft of 466 Squadron Driffield, 12 aircraft of 578 Squadron Burn, and 14 aircraft of 640 Squadron Leconfield were detailed.

196 aircraft attacked the primary target, 12 aircraft were abortive, not over enemy territory, 2 aircraft abortive over enemy territory.

Casualties:– 1 aircraft of 77 Squadron is missing.

Results:– Owing to 10/10 cloud over the target, there is little evidence on which to base an assessment of this attack but it seems to have been scattered. A few breaks in the cloud were found outside the target and three photographs showing ground detail were plotted. One seven miles north east, and two fourteen and a quarter miles south west. The Master

Bomber ordered crews to bomb T.I.' Green and to ignore the "Reds", none having been dropped by PFF.

There was some confusion due either to the presence of decoy markers or to scattered PFF markers, or even both. Decoy fires also appear to have been lighted. Where possible the Master Bomber's instructions were followed, though a number of crews saw little but a glow in the cloud. Ground defences were moderate in the target area but more intense in Mersberg and Zeitz. There was slight fighter activity at the target.

SECRET **FORM 540** **OPERATIONS RECORD BOOK**

H.Q. No.5 Group

Morton Hall

Night of 13/14 February 1945

Target Dresden

248 Lancasters and 9 Mosquitos were detailed, 2 were cancelled, 246 Lancasters and 9 Mosquitos took off. 8 returned early, 244 were successful. 1 failed, 1 outstanding and 1 missing.

Casualties:— 463 Squadron – F/O Fernley-Stott.

Results:— There was 9–10/10ths medium cloud in three layers, at approximately 3 – 5,000ft, 6 – 8,000, and 15–16,000ft. Visibility was good between layers. The Controller appeared satisfied with the position and concentration of the markers and bombing was carried out on the glow of Red T.I.'s. No results were observed owing to cloud conditions, but the general impression was that the attack went according to plan. Meagre Flak was experienced over the target, a few bursts of heavy Flak, no light. One or two fighters were seen in the target area. One Lancaster bombed Cologne, owing to engine failure on the outward journey.

SECRET
FORM 540
OPERATIONS RECORD BOOK

H.Q. No.6 Group

Allerton Hall
13/14 February 1945

Operations

Below is a summary of aircraft detailed for, and results of an attack on Dresden.

Squadron	A/C	No	Successful		Abort	Outstanding
		Detailed	"A"	"B"	NOET	
419	Lancaster	15	15			
424	Lancaster	7	7			
428	Lancaster	9	9			
431	Lancaster	14	13		1	
433	Lancaster	7	7			
434	Lancaster	15	15			
Totals		67	66		1	

Weather was clear to 3/10ths patchy cloud with tops 4–5,000ft. Visibility was good though there was some haze and smoke from the previous attack. Markers were well concentrated and target land marks were seen clearly by the light of the flares and fires from the previous raid. The Master bomber was clearly heard. He instructed crews to bomb the centre of the markers and later the centre of the fires. Several large explosions were seen including an orange one and two

huge red ones. Smoke plumes rose to 15,000ft. Late arrivals reported the target to be a sea of fire with the glow visible for 160 miles. Fires from the previous raid were seen 60 miles away on the route in. This was considered to have been an excellent attack. Slight heavy flak in loose barrage form was encountered, but there were no searchlights. Two aircraft were shot down in the target area, one homeward, and one outward. A few enemy fighters were seen and there were two combats on the homeward route but no claims. 220.2 tons of high explosive were dropped.

Operations

Below is a summary of aircraft detailed for, and results of an attack on Bohlen.

Squadron	A/C	No	Successful		Abort	Outstanding
		Detailed	"A"	"B"	NOET	
408	Halifax	16	15			1
415	Halifax	15	15			
420	Halifax	14	14			
425	Halifax	14	14			
426	Halifax	14	12			2
427	Halifax	14	14			
429	Halifax	14	13	1		
432	Halifax	14	13			1
Totals		115	110	1		4

There was 10/10ths strato-cumulus cloud, possibly in two layers at 4–5,000ft and 8–10,000ft, horizontal visibility was fair to good. No illuminating flares or sky markers were reported. T.I.'s red, which were probably dummies, were widely scattered, and as soon as the Master Bomber instructed crews to bomb near the edge of the glow of the Green T.I.'s, dummy greens appeared. Few results were seen but one big dull orange explosion lit up the target for five minutes. The glow of large fires was seen up to 90 miles away on the return, but crews consider the attack to have been scattered. Slight to moderate heavy flak was encountered. A few fighter flares were seen from 09.00E into the target on track. Several fighters were sighted but no combats were reported.

All our aircraft were diverted to American Bases on return. 253 tons of high explosive were dropped.

SECRET **FORM 540 OPERATIONS RECORD** **BOOK**

No.8 (P.F.F.) Group

Huntingdon

Night of 13/14 February 1945

Targets

Dresden, Magdeburg, Bonn, Dortmund, Misburg, Nuremburg & Synthetic Oil Plant Bohlen. Period 21.41/06.51 hours.

Attack on Dresden

In accordance contained in Form B.505, 61 Lancasters took off. 59 attacked the primary target; 1 was abortive and 1 was missing. On approach to the target large fires were visible from the previous attack, and despite illuminating flares the smoke from these fires made it impossible to identify the aiming point with certainty. The Master Bomber therefore instructed the Blind Markers to drop their Green T.I.'s and after assessing these, ordered the Main Force to overshoot by 2 seconds. Later bombing was directed on to Red T.I.'s: and finally the centre of the fires. Bombing was very well concentrated with some tendency to overshoot the area covered by the first attack. A large fire area was left burning, visible for many miles on the return journey and all crews were enthusiastic at the results achieved. Pathfinder Force Provisional Analysis of Operations No.226 attached.

18.29/02/26 Hours.

Attack on Braunkohle-Benzin AG Bohlen

In accordance with instructions contained in Form "B" No. 506, 8 Mosquitos and 34 Lancasters took off; 7 Mosquitos and 21 Lancasters attacked the Primary target; 1 Mosquito and 13 Lancasters were abortive. Owing to cloud conditions the Master Bomber instructed the Illuminator who had not dropped, to retain their flares, and told the Main Force to bomb first the rear edge of the glow of Green T.I.'s and later its centre. The T.I.'s appear to have been somewhat dispersed over the marked area. However, a large explosion was seen at 22.06 hrs. Several crews reported seeing Red markers, but no Red markers were dropped. These are believed to have been dummies, and the Master Bomber instructed crews to ignore them.

Defences:– Slight to moderate heavy flak, barrage and predicted.

Pathfinder Force Provisional Analysis of Operations No. 227 attached.

19.49/00.17 Hours.

Attack on Magdeburg (First attack)

In accordance with instructions contained in Form "B" No. 506, 62 Mosquitos took off. 61 attacked the primary target and 1 was abortive. The attack opened at 21.30hrs with T.I. Yellow and flares Red/Green Stars dropped by 7 of the H2S aircraft. The T.I.'s were generally well grouped, with close bunches of sky markers above them, and although the T.I.'s quickly disappeared into cloud, they, or their glow, were bombed by all crews. Bomb bursts were seen within the area of the glow on the cloud and bombing is thought to have been fairly well concentrated.

Defences:– Negligible heavy flak – jet aircraft seen on homeward route.

23.16/03.44 Hours.

Attack on Magdeburg (Second attack)

In accordance with instructions contained in Form "B" No. 506, 9 Mosquitos took off and attacked the primary target. All three Marker aircraft dropped markers and bombed on H2S. The T.I.'s were not seen by the following aircraft, five of which bombed successfully on Loran. Several bomb bursts were seen close together.

Defences:– Slight heavy flak, predicted and accurate for height.

23.30/03.44 Hours.

Attack on Misburg (Experimental attack)

In accordance with instructions contained in Form "B" No. 506, 8 Mosquitos took off; 7 attacked the primary target and 1 was abortive. 4 aircraft successfully bombed by means of their precision device and the remaining 3 aircraft carrying precision device attacked by means of navigational aids.

Defences:– Nil

22.31/02.22 Hours

Attack on Bonn (Spoof attack)

In accordance with instructions contained in Form "B" No. 506, 16 Mosquitos attacked the primary target. All OBOE aircraft successfully dropped T.I.'s Red on their precision device. These markers, together with T.I. Greens dropped by other aircraft, quickly disappeared into cloud and although some crews bombed the glow, most attacked by means of



navigational aids. Some bomb bursts were seen in the marked area, but cloud precluded any further assessment.

Defences:– Nil
19.20/23.11 Hours.

Attack on Dortmund (Spoof attack)

In accordance with instructions contained in Form “B” No. 506, 6 Mosquitos took off; 5 aircraft attacked the primary target and 1 was abortive. 2 aircraft attacked by means of their precision device, and 3 having failure of their precision device attacked by means of their navigational aids.

Defences:– Negligible
20.03/00.43 Hours.

Attack on Nuremburg (Experimental attack)

In accordance with instructions contained in Form “B” No. 506, 8 Mosquitos took off; 7 attacked the primary target and 1 was abortive. 3 aircraft bombed by means of their precision device, and 4 aircraft, having failure of precision device attacked by means of their navigational aids.

Defences:– Few ineffective searchlights.

SECRET
FORM 540
OPERATIONS RECORD BOOK

No.83 Squadron P.F.F.

Coningsby
13 February 1945

Orders for operations came through early and the Squadron detailed fourteen crews. Squadron briefing was held at 14.45hrs the target being Dresden. Take off was soon after five o'clock into a lovely sunny evening. The following crews took part:–

Primary Blind Marker	Flare Force 1
F/L Duncan W 50	W/C Twiggs B 32
F/L Norbury J 53	F/O Phillips M 34
F/O Cassidy T 24	Flare Force 3
F/O Inniss D 46	F/O Dodson Y 17
Flare Force 2	F/O Brown Q 21
F/L Siddle S501/2	<i>Emergency Wave</i>
F/O McNeil G 15	F/L Pereira U 29
F/O Shand L 22	F/L Edwards A 38
	F/L Cartwright R 31

On the circuit return W/Cdr Twiggs had a narrow escape from collision having his tail damaged by another aircraft.

Note F/L Siddle will also act as LINK 2.

SECRET **FORM 540** **OPERATIONS RECORD BOOK**

No.97 (Straits Settlements) Squadron

Coningsby
13 February 1945

ATTACK ON DRESDEN

Rain during the morning prevented early flying but Operations were laid on to attack Dresden a very important rail centre for the supply of German armies at the Russian Front. Take off for the sixteen crews detailed was at 18.15hrs with "H" Hour at 22.15hrs. Although the route outward went through the Ruhr North of Cologne, no one was troubled by the defences. Marking at the target was both quick and accurate by all the Primary Blind Markers, Flare Forces and Mosquitos, although a thin layer of stratus cloud existed over the target. Main force was called in to bomb and it was done very well to judge by the Controller's remarks. No photographs were obtainable. All crews returned safely to Base. Other Groups detailed to attack the same target two hours later reported first seeing the fires 150 miles away. Their photographs showed considerable destruction wrought by the previous attack.

Lancaster 111 "R" PB156 F/L F P Taylor

Time Up 18.20 Time Down 02.52

Load 5 x R/P Flares Green/Red
5 x 1,000 M.C. (Delay)
2 x 1,000lb T.I. Green

Half cover 7/10ths layer cloud with stratus at 15,000ft. Target identification on H2S. Through a slight break in cloud a Green T.I. was seen to drop about 22.02¹/₂hrs. Flares gave good illumination and were well concentrated. Controller assessed some Green T.I.'s 100 yards South of M/P. Controller seemed well pleased with attack. Fires seen burning when we were over 90 miles on the way home.

Lancaster 111 "O" PB408 F/O J W Greening

Time Up 18.15 Time Down 03.02

Load 5 x R/P Flares Green/Red
5 x 1,000 M.C. (Delay)
2 x 1,000lb T.I. Green

9/10ths strato-cu. Target located on H2S. Dropped our Green T.I.'s and bombs as briefed, but distributor arm did not move when bomb teat was pressed until tapped, causing a five secs. Delay in actual release. Early in the attack, about "H" 17, Controller said no more flares needed: Probably did not need F.F.3 Red T.I. assessed as being within 200yds. Main Force told to bomb glow from Reds as planned.

Lancaster 111 "H" PB700 F/L B J Hines

Time Up 18.14 Time Down 03.12

Load 5 x R/P Flares Green/Red
5 x 1,000 M.C. (Delay)
2 x 1,000lb T.I. Green

8-9/10ths cloud. Target located on H2S. Went through the target dropping load as briefed, as P.B.M. Turned to port ready to line myself up for emergency, as I was unable to see T.I.'s for quite a while. On the second run over the target, glow of Reds could be seen through gaps in cloud, also slight

ground detail. Controller instructed Main Force to bomb Red T.I.'s as planned. After the first five minutes he said bombing was getting a bit wild. At "H"-6 Controller ordered no more Flares.

Lancaster 111 "B" PB157 F/O W P Ryan

Time Up 18.11 Time Down 03.23

Load 12 x C.P. No.1

5 x R/P Flares Green/Red

9/10ths thin cloud. Target identified on H2S. Dropped flares as briefed. Green T.I. seen cascading at "H"-11. Glow from T.I.'s and faint detail seen.

Lancaster 111 "J" PB410 W/C R Baker

Time Up 18.17 Time Down 03.13

Load 12 x C.P. No.1

5 x R/P Flares Green/Red

Medium cloud approx. 1 mile East of target. Target covered by 10/10ths strato cu. Tops 5,000ft. Identification by H2S (Mk3) Glow of one or Two Green T.I.'s throughout. Our flares first to go down and so there were no flares released before time. Starboard outer engine lost power and after showing signs of catching fire was feathered near Base on return.

Lancaster 111 "S" PB376 F/O T W Noon

Time Up 18.24 Time Down 03.18

Load 12 x C.P. No.1

5 x R/P Flares Green/Red

8-9/10ths cloud, slight breaks. Target identified on H2S. Dropped flares blind as briefed. Green T.I. a little early. One Red T.I. cascaded at about 8,000ft, before P.B.M. went down.

Controller told LINK 1 to tell Main Force to come below medium cloud at 15,000ft and bomb Red T.I. glow according to plan. One stick of bombs apparently went wide.

Lancaster 111 "P" PB422 F/O F M Negus

Time Up 18.20 Time Down 02.54

Load 12 x C.P. No.1

5 x R/P Flares Green/Red

9-10/10ths cloud, thin layer of medium above. Target identified on H2S. Dropped flares as ordered. One Green T.I. seen cascading at 22.05¹/2hrs.

Lancaster 111 "F" PB473 F/L N McConnell

Time Up 18.18 Time Down 03.35

Load 14 x C.P. No. 3

10/10ths cloud approx. 6,000ft Controller ordered no more flare at 22.08hrs precisely, as we were running up to release. Jettisoned flares at position 48.30N 08.05E at 00.22hrs. At 15,000ft aircraft started to ice up. As LINK 1 we passed the following messages:- 22.08 'No more flares' to Flare Force. 22.11 'Attack Red T.I. as planned to Main Force. 22.13 'Come below cloud'. 22.19 'Attack red glow'. 22.20 'Complete bombing and return to Base'. 22.23 'Return to Base'. 22.28 'Target Attacked'.

Lancaster 1 "L" PB811 F/L R B Sexton

Time Up 18.19 Time Down 03.22

Load 14 x C.P. No.3

9/10ths thin cloud below, 10/10ths above. Target located on Green T.I.'s which were seen quite clearly through the cloud and were very concentrated. Red T.I.'s not seen until after



leaving target; assessment of 100 yards East of M/P was heard at 22.06hrs. Controller ordered Main Force to bomb concentration of Reds as planned! C.P. No. 3 hung up, and was brought back to Base.

Lancaster 111 "M" PB895 F/O A E May

Time Up 18.19 Time Down 03.22

Load 14 x C.P. No.3

9/10ths thin cloud below 10/10ths above. Target identified by Green T.I., and flares. As our last flares dropped at 22.08¹/₂hrs, Controller said 'No more flares' Mosquitos had dropped and assessed their Red T.I.

Lancaster 111 "Q" PB521 P/O A M Dow

Time Up 18.21 Time Down 03.29

Load 12 x C.P. No.33
2 x 1,000 M.C. (delay)

7/10ths cloud, tops 6,000ft. Target identified by Green T.I., Red T.I. and flares. We were about to make blind flare run when Controller said he wanted no more flares – about "H"–5. We were CHECK 3, and he called on three occasions for information about Red and Green T.I., Replied they were visible from our height. Meanwhile we continued our run to drop bombs, but they did not go owing to faulty manipulation. Controller said marking was good; bombing improved as it went on.

Lancaster 111 "T" ND589 Lt P J H Addison

Time Up 18.10 Time Down 03.19

Load 12 x C.P. No.33
2 x 1,000 M.C. (delay)

9/10ths cloud at approx. 5,000ft. Target located on H2S (Mk3) Controller ordered no more flares at 22.09. Bombs released on box. Good Picture. Good Red glow also seen. Fires observed for 30 mins after leaving target.

Lancaster 111 "D" PB706 F/O K G Robertson

Time Up 18.30 Time Down 03.03

Load 5 x R/P Flares Green/Red
6 x 1,000 M.C. (delay)
1 x 500 M.C.

9–10/10ths thin cloud. Target located on H2S. Dropped bombs blind as briefed. Markers seemed very concentrated and could be seen quite plainly through the cloud.

Lancaster 111 "C" PA973 F/O J D Cottman

Time Up 18.31 Time Down 03.39

Load 5 x R/P Flares Green/Red
6 x 1,000 M.C. (delay)
1 x 500 M.C.

Layer of cloud at 15,000ft. Strato-cu at 2,000ft 8/10. Identification of target on H2S. We arrived and were preparing our run to drop flares when we realised that ground marking was being carried out. At 22.09hrs 'No more flares', and at 22.12 Main Force were called in to bomb below cloud. Good spread of fires seen inside bend of river. Rear Gunner reported at 22.45 that the fires could still be seen.

Lancaster 111 "E" PB588 F/L C W Eaton

Time Up 18.29 Time Down 03.08

Load 5 x R/P Flares Green/Red

6 x 1,000 M.C. (delay)

1 x 500 M.C.

7/10ths cloud: thin. Target located by Red T.I. and river check on H2S. Red T.I. assessed as 200 yards North of M/P.

Controller appeared satisfied with marking. Order 'No more flares' came early in the attack. Main Force told to come below medium cloud (at 15,000ft) LINK 1 passed message 'Return to Base'. Many incendiaries seen in built up area and around river.

Lancaster 111 "G" ME623 F/O J Vallance

Time Up 18.13 Time Down 03.48

Load 6 x 1,000 M.C.

1 x 500 M.C. (delay)

10/10ths thin cloud. Target located visually. LORAN equipment U/S; unable to locate ourselves on H2S. No response on Ruhr Gee Chain. We did locate ourselves but were forty miles North East of target. Saw flares and T.I.'s on Dresden and returned to attack. Dropped load on Red glow beneath the cloud. After leaving the target and passing over layer cloud it was seen that the target was well alight.

SECRET FORM 540 OPERATIONS RECORD BOOK

No.627 Squadron RAF



Woodhall Spa
13 February 1945

8 aircraft were detailed and took off on operations against Dresden. Primary Blind Markers and flares were on time and accurate. The illumination was excellent. The Marker Leader was the first to identify and his T.I.'s were assessed by Marker 2 as one hundred yards east. Backing up was ordered and was completed quickly and accurately, the resulting concentration being some three hundred and fifty to four hundred yards east to west and centred approximately one hundred yards south east of the M.P. The remaining Mosquito was too late to attack. Main force appeared accurate. Fires took a good hold and several explosions were observed.

APPENDIX "G"

to F540 of No.627 Squadron for 13 February 1945

No.627 Squadron Summary of Operations
Night of 13/14 February 1945

Target Dresden

Woodhall Spa

Mosquito "W" DZ631 F/L W W Topper Marker Leader
F/O V W Davies

Time Up 19.57 Time Down 01.53

Load 1 x 1,000lb Red T.I. returned to Base not required.
Primary Greens fell on time and also flares marking the M.P.
immediately visible. A/C dropped T.I. which was assessed by
MARKER 2 at 100 yards east. This was passed to the
Controller who requested backing up by all Markers. This was
well carried out – the resulting concentration was 400 yards
east to west across the M.P. Markers were visible through
cloud. The MARKERS were called off and the Main Force told
to bomb the Red T.I.'s. MARKERS were ordered home and
the MARKER LEADER stayed to watch the bombing which
was very good. There was a large explosion in the S.E. of the
target followed by an electric blue flash of 3 seconds duration.

Mosquito "F" DZ599 F/O J Walker Marker 2
W/O K R Oatley

Time Up 20.00 Time Down 01.42

Target as above. Load 1 x 1,000lb Red T.I. Identification
visually by flares which were on time. Marker Leader
marked first, T.I. assessed as 150 yards east of M.P. This
A/C backed up next. T.I. falling on S.E. corner of target.
Concentration was very good.

Mosquito "P" KB416 F/L Armstrong Marker 3
(RAAF 416199)
F/O E G Patterson

Time Up 19.56 Time Down 01.37

Target as above. Load 1 x 1,000lb Red T.I. Primary Blind
Markers and flares on time and accurate. A/C fourth was
fourth in and backed up accurately.

Mosquito "Q" DZ650 F/O J W Buckley Marker 4
(RNZAF)
F/L J C Crosbie

Time Up 19.56 Time Down 01.44

Target as above. Load 1 x 1,000lb Red T.I. and 1 Wanganui
Flare. A/C overshot the target and was approximately 10
minutes late by which time marking had been completed.

Mosquito "H" DZ606 F/O J O Rolland Marker 5
F/O J Holling

Time Up 19.55 Time Down 01.34

Target as above. Load 2 x 1,000lb Red T.I.'s. Arrived north of
target 2 Green T.I.'s were seen on each side of the river. Flares
were on time and right over the target centre. Approximately
10 seconds after flares went down Marker Leader "Tally
Ho'd". Marker 2 assessed 150 yards east. A/C backed up.

Mosquito "G" DZ611 F/L J W L Alford Marker 6
(RAAF)
F/S J Murphy

Time Up 20.05 Time Down 01.36

Target as above. Load 2 x 1,000lb Red T.I.'s. Primary Blind Markers and flares were on time and accurate. Our T.I.'s fell approximately 100 yards north east of M.P.

Mosquito "J" KB345 F/O A McClelland Marker 7
(RAAF)
P/O M A Phillips
(RAAF)

Time Up 20.01 Time Down 01.46

Target as above. Primary Blind Markers and flares were accurate and on time. A/C was third in backing up. T.I.'s falling in concentration.

SECRET

APPENDIX 150 OF FORM 541

OPERATIONS RECORD BOOK

No.625 Squadron RAF

Kelstern

13 February 1945

Operations

23 aircraft took off to attack this virgin target Dresden. Two aircraft "K" and "B" were abortive. Weather on route was poor, aircraft climbing over the tops of frontal cloud. Over the target 3/10ths Alto-Stratus kept the aircraft below 19,000ft. The fires at the target were visible 100 miles before our aircraft got there, due to the bombing of the previous attack two hours earlier. Large sticks of flares, mixed Red and Green T.I.'s clearly identified the target. The Master Bomber's instructions were very good and the town was seen burning profusely. Defences were negligible. All our aircraft returned safely to Base.

Weather

Continuous rain with moderate visibility during the morning. Fair to good visibility in the afternoon.

SECRET

FORM 540 APPENDIX "H"

OPERATIONS RECORD BOOK

No.635 Squadron RAF

Downham Market
13 February 1945

5 A/C detailed to attack Bohlen (3 Blind Illuminators, 1 Visual Centre aircraft and 1 Supporter. One A/C withheld its all marker load ("X" F/O Ed Harper) Bombs dropped by other aircraft 1 x 4,000lb H.C., 4 x 2,000lb H.C., 4 x 500lb Mk64, 10 x CP No.3 White, 1 CP No.1 R/G stars, 4 x 250 T.I. Green between 21.57.48 and 22.03.24 hours from 17,600/18,000ft. Weather 10/10ths st.cu. tops 4/6,000ft. Visibility poor. On approach to target no T.I.'s visible. One A/C observed and bombed on H2S. Slight flak.

"C" F/O Lewis
"L" F/L R W Toothill
"X" F/O E D Harper
"J" J D F Cowden
"E" F/L D B Jarvis

11 A/C were detailed to attack Dresden. (Master Bomber, Deputy Master Bomber, 2 Blind Illuminators, 3 Blind Markers, 2 Blind Spare Markers and 2 Visual Center-ers) All attacked Primary. Bombs dropped:- 4 x 4,000 H.C. 17 x 1,000 M59, 31 x 500 M64, 26 x CP No.3 White Flares, 1 x CP No. R/G Stars, 8 x 250 T.I. Green, between 01.2354 and 01.45.30hrs from 7/8,000ft. Weather clear. Vis. Good. Smoke from earlier attack obscured the A/P despite flares dropped at 01.20hrs. Master

Bomber therefore called to Blind Markers to drop their T.I.'s Green at 01.26.30hrs. First T.I. Green went down at 01.28.30hrs and appeared to fall about 1,000 yards South West of where the A/P was judged to be. Master Bomber instructed Main Force to overshoot this Green by 2 seconds. Deputy Master Bomber observed a Red T.I. burning on the South Bank of the river and Master Bomber instructed Main Force from 01.33 to 01.35hrs to bomb on this. Later instructions from the Master Bomber were to "Bomb centre of fires". None of the 'Visuals' dropped their mixed T.I.'s. Main Force bombing appeared to be well concentrated and the centre of the town should be completely gutted. It is felt that the marshalling yards and the South East area of the town escaped major damage. Slight heavy flak and some fighter activity.

"M" F/O R S Bishop
"F" F/O W H Jackson
"N" S/L E A O Mange
"B" W/C H P Connolly
"A" F/O K A Beattie
"K" F/L Boyde
"Z" F/O C L Ottaway
"U" S/L C P C DeWesselow
"T" W/C H J F LeGood
"Y" F/L P E Cawthorne
"S" F/L G C Hitchcock

SECRET
FORM 541 APPENDIX "H"
OPERATIONS RECORD BOOK

No.635 Squadron RAF

Downham Market
13 February 1945

Lancaster 111 NE 180 "U" S/L DeWesselow

Time Up 22.02 Time Down 06.51

Dresden

Master Bomber. On arrival target was well ablaze and fires made it impossible to identify the Aiming Point. 01.20hrs called on Blind Illuminators for flares and at 01.26.30 and 01.27.30hrs called on Blind Markers for T.I.'s. First Green T.I. at 01.28.30hrs fell about 1,000 yards South West of estimated position of Aiming Point. 01.29hrs Main Force were instructed to overshoot Green T.I.'s by two seconds. In the next minute one Green T.I. fell slightly North West and another 1,200 yards South East of estimated Aiming Point. At 01.32.54hrs Deputy Master Bomber reported Red T.I. on South Bend of riverbank. At 01.33, 01.34 and 01.35hrs Main Force instructed to bomb centre of fires. Centre of town gutted but thought Marshalling Yards South East of the town escaped damage.

Lancaster 111 PB287 "T" W/C H J F LeGood

Time Up 21.05 Time Down 06.48

Dresden

Deputy Master Bomber. On run up fires and smoke observed. Aiming Point Green T.I.'s at 01.26.30 and 01.28hrs were quickly bombed out. Bombed centre of fires. 01.30.30hrs Red T.I. seen 01.30.35hrs and Master Bomber informed. Smoke up to 13,000ft when leaving the target.

SECRET
OPERATIONS RECORD BOOK

No.100 (Bomber Support) Group

Bylaugh Hall
14 February 1945

100 Group Activity

Mandrel Patrol

12 Halifaxes took off	9 Completed Patrol	Nil Missing
8 Stirlings took off	8 Completed Patrol	Nil Missing

Window Patrol

11 Halifaxes took off	9 Completed Patrol	Nil Missing
11 Liberators took off	11 Completed Patrol	Nil Missing

Jostle & Piperack

8 Fortresses took off	7 Completed Patrol	Nil Missing
1 Mosquito took off	1 Completed Patrol	Nil Missing

Special Investigation Patrol

2 Mosquitos took off	2 Completed Patrol
5 Halifaxes took off	3 Completed Patrol

High Level Intruders

63 Mosquitos took off 56 Completed Patrol
Claims:– 2 Me. 110's destroyed by Bomber Support
Development Squadron
F/L Howard and F/O Clay
21 Chases.

Low Level Intruders

3 Mosquitos took off 3 Completed Patrol

Fighter Command Intruders

3 out of 5 Mosquitos completed low level intruder patrols of the followiing airfields:– Dortmund and Werle, Kassel/Rotherweston, Guttersloh.

2 Mosquitos returned early due to weather.

Weather:–	Bohlen 8–10ths cloud at target, tops about 8,000ft
Dresden	1st attack 9–10/10ths medium cloud in 3 layers at approx. 3–5,000ft, 6–8,000ft and 15–16,000ft. Visibility good between layers
Dresden	2nd attack clear to 3/10ths patchy cloud tops 4–5,000ft. Visibility good with some haze and smoke from previous attack
Magdeburg	1st and 2nd attack 10/10ths St.Cu. tops about 10,000ft
Bonn	10/10ths layered St.Cu tops 20,000ft
Dortmund	10/10ths St.Cu. tops 20,000ft
Misburg	6–10/10ths low St.Cu. tops 10,000ft
Nuremburg	4–10ths St.Cu. tops 15,000ft Visibility good

Enemy Raid Reaction

The Bomber Support problem was to deploy the available Bomber Support Force to the best advantage to cover two distinct phases, separated by about three hours. The time gap was too long to allow the same forces to be used with each phase. It was, therefore, not possible to cover completely each phase. The solution of the problem was aided by Bomber Command's appreciation of the weather in the approach area; and Bomber Support plan was based on this operation.

1st Phase

Bomber Command timed the approach of the 5 Group force over the Ruhr when it was considered the enemy fighters in that area could not take off. At this time however, it was thought possible that fighters in the Southern approach area could fly, so it was consequently decided to attempt to confuse these southern fighters while 4 and 6 Group Main Force crossed the Front Line in the Luxembourg area. The first Mandrel screen was placed opposite the area during the approach across France and the first Window force broke away from the Main Force in a South Easterly direction as the latter crossed the Front Line. The Window force fanned out to cover a frontage of about 35 miles covering the Frankfurt/Mannheim area. This had the effect of drawing off all the fighters airborne in the Southern area whilst the Main Force passed the danger area further North.

The weather appreciation proved correct and the 5 Group force crossed the dangerous Ruhr without being molested.

Meanwhile the Mandrel screen moved up to a more Northerly position to cover the Ruhr to confuse any fighters in that area that might later have become airborne as a result of the weather improving further North. The screen then ceased jamming before a second screen took up position.

2nd Phase

In this phase it was anticipated that the Ruhr would be clear, consequently a second Window force was used to the North of the approach line of the 1 Group Main Force breaking away from the latter as it crossed the Front Line and proceeded towards Bonn. The second Mandrel screen was used to cover the approach of the Main Force and was moved up North to cover the Ruhr and add plausibility to the Bonn feint.

Operation

The night's operation will undoubtedly be recorded as one of the major successes over the enemy night fighter defences, for accurate appreciation of the weather, the intricate routing of the Bomber Forces and the record Bomber Support effort so entangled the enemy controllers that none of the main raids were seriously opposed by the night fighters and, with two possible exceptions all the Fighter Gruppen airborne were diverted against the Window feint raids and were landed when the enemy controllers realised that they had been misled and that their position for intercepting the Main Force was hopeless.



1st Phase

No plots on the Forces were broadcast until the Formations were East of the Mandrel screen and plotting on the 5 Group raid commenced North of Aachen and continued intensively over the Ruhr area. From that position through to the target and along the route home as far as Stuttgart the Force was continuously tracked but not with the same intensity as in the early stages. It was, however, the plotting of the Window feint force which proved the undoing of the enemy night fighter defences. Plotting of this Force started soon after emerging from the Mandrel screen and continued with growing intensity through to an area just West of Frankfurt/Mannheim. The Force continually being reported as strong four-engined formations and the area covered by the plots fitted most accurately with the planned routes of the aircraft. For some 80 miles East of the Battle Front this feint force held all the plotting and in consequence the Bohlen raiders escaped unnoticed during this time. The full degree to which the enemy controllers were deceived by this raid was shown by the deployment of the night fighters. As stated above, the aim of the feint was to draw off all the fighters that could fly from the Southern areas and it succeeded in copy book fashion. Immediately following the first plot on the Window force, aircraft of 11 NG.6 were sent to Karlsruhe and then to Beacon Dachs. This Gruppe was immediately followed by IV NJG.6 from Kitzingen who, instead of being held over a Beacon, were vectored direct into the approaching Window aircraft. A little later a third Gruppe were ordered well into the Window track (Beacon Kaus) and another unidentified unit was assembled over Beacon Otto. Thus it appears that all the night fighters airborne in the Frankfurt/Stuttgart area were all employed against the Window force while the Main raid proceeded on its

course unmolested, although fairly well tracked from North of Koblenz, to the target and along the route home as far as 20 miles West of the Battle Front.

After the Window aircraft had commenced their return flight, instructions were passed to the fighters to proceed to Beacon Otto and a mention of Intruders over Beacon Nachtigal made it appear that the controllers contemplated a long stern chase after the bombers who at that time were approaching Erfurt but they quickly appreciated the hopelessness of the situation and landing orders followed immediately. This ended all the known night fighter activity against these two strong raids of very deep penetration. The Special Ruhr defence (Geschwader Units of NJG.1) broadcast plots on the returning bombers from two Beacons in the Ruhr but no night fighter instructions were given and so far there is no evidence that the aircraft of this Geschwader actually flew.

2nd Phase

The second Phase also went according to plan for while the Window feint force in the Koblenz/Cologne area was being reported as a strong bomber formation, the 560 aircraft en route to Dresden were being reported as 8 four engined aircraft. It was not until this force was some 100 miles East of the Battle Front that its strength was appreciated and then back tracking on it gave a few plots North East of Luxembourg and West of Mannheim. From the South of Frankfurt regular tracking operated and continued along the route and as far home as Strasbourg, but at no time with the same intensity as the raids in the First phase. The plan position of the plots broadcast indicated that the bomber force was considerably strung out both as regards front and depth. No organised fighter defence was made up by the

enemy but a few aircraft from the Finow area were given plots in the target area and these being given in a somewhat desultory manner combined with the lack of fighter instructions, indicated that it was a half hearted effort.

Intruders

The intruder plan for the night appeared to have been successful for in the first phase the concentration of those aircraft in the Southern area undoubtedly impressed enemy controllers with the reality of the Window feint attack and strengthened the impression that the Target was well South. Some 20 chases on aircraft which were most probably hostile resulted and 2 Me.110's were destroyed. It is of interest to note that the initial contacts on these two aircraft were achieved by Serrate Mk.IV (a 100 Group produced homer on SN2).

COUNTERMEASURES

Special Mandrel

On Stand By

20.05–21.10/21.50–23.00/23.35–00.30/01.00–02.30hrs

32 to 34.5 Mc/s covered 20.50–21.10hrs

34.5 Mc/s covered 21.50 23.00hrs and 23.35–00.30hrs

34.2 to 34.7 Mc/s covered 01.00–02.30hrs

Airborne Mandrel – 100 Group

There were two Mandrel screens in operation, the first being composed of 9 aircraft of 171 Squadron, which were in position between 50.38N 05.40E and 49.44N 05.43E from 20.05 to 21.10hrs At 21.10hrs these aircraft moved into new position between 51.32N 05.30E and 50.51N 05.34E and remained in these positions until 22.50hrs.

Jammers were operating from 20.05 to 21.10hrs and from 21.50 to 23.00hrs. In addition to the above 9 aircraft one of 171 Squadron jammed from 21.50 to 23.00hrs, being late, due to late take off.

The second Mandrel screen was comprised of one aircraft of 171 Squadron and 8 of 199 Squadron. The position of these aircraft were the same as for the aircraft of the first screen between 50.38N 05.40E and 49.44N 05.43E from 23.35 to 00.30hrs, and between 51.32N 05.30E and 50.51N 05.34E from approximately 01.00 to 02.30hrs.

Jammers were operated from 23.35 to 00.30hrs and from 01.00 to 02.30hrs.

Window Feint Force

The northern Window Feint Force comprising of 9 aircraft of 223 Squadron and 1 aircraft of 462 Squadron released Window at the rates detailed from 05.30E on track from 49.50N 04.00E to position "A" approx. 49.52N 05.50E (00.40hrs at this point) thence position "B" approx. 50.24N 06.33E and to position "C" between 50.55N 06.46E and 50.22N 07.08E and from "C" to 06.30E on track towards position "D" 50.10N 05.00E.

The southern Window Feint Force comprised of 2 aircraft of 192 Squadron, 2 of 223 Squadron and 6 of 462 Squadron. Window was released from 05.30E on track (from 50.00N 04.00E) to position "A" 50.00N 06.00E (20.52hrs) thence position "B" between 49.58N 08.10E and 49.25N 07.59E thence on track towards position "C" 49.25N 07.48E.

Incendiaries were dropped on Kaiserlauten by aircraft of 192 and 462 Squadrons between 21.15 and 21.27hrs.

AIRBORNE RADIO COUNTERMEASURES 100 GROUP

Aircraft of 192, 214 and 223 Squadrons supported the Main Forces which attacked Dresden and Bohlen and aircraft of the Window Feint Force also employed Radio Countermeasures. Full details are as follows:—

- A Dresden (1st attack) 2 aircraft of 214 Squadron operated Jostle on VHF and H.F. also Carpet and Piperack on several frequencies. 1 Mosquito aircraft of 192 Squadron operated Piperack from 21.45 until 22.28hrs.
- B Dresden (2nd attack) 3 aircraft of 214 Squadron operated Jostle on VHF and H.F. (3390, 3487 and 4485Mc/S) and Carpet on several frequencies. Also Piperack.
- C Bohlen 2 aircraft of 214 Squadron operated VHF Jostle, Carpet and Piperack.
- D Window Force (Northern) Aircraft of 223 Squadron operated VHF and H.F. Jostle, Carpet between 495 and 590 Kc/s and Piperack.
- E Window Force (Southern) Aircraft of 223 Squadron operated VHF Jostle, Carpet between 455 and 575 Kc/s and Piperack.

Night Fighter Support

1st Phase

Plan

Patrol (a) 24 Mk.X. a/c to patrol given Beacons which might be used by hostile a/c as assembly points. Patrols to commence at various times between 21.00 and 22.00hrs.

Patrol (b) 4 A.S.H. aircraft to patrol Dresden and 4 A.S.H. aircraft to patrol Bohlen. Aircraft to escort bombers on their 1st leg home. Patrols to commence at 21.40hrs.

Patrol (c) 1 Mk.1V and 1 Mk.X aircraft to patrol; given Beacons. Patrol to commence at 20.35hrs.

Patrol (d) 3 A.S.H a/c to patrol Dortmund area. Patrols to commence at 21.13hrs.

Patrol (e) 13 A.S.H. aircraft to patrol airfields. Patrol to commence at 21.58hrs.

53 aircraft took off. 2 Me.110's were claimed destroyed (F/L Howard and F/O Clay)

2nd Phase

Patrol (f) 4 A.S.H. a/c to escort bombers to target area and back as far as possible Patrol to commence at 01.20hrs.

Patrol (g) 7 Mk.X. a/c to patrol given Beacons. Patrol to commence at various times between 00.20 and 02.10hrs.

12 aircraft took off.

Claims:— Nil

1st Phase (Operation)Patrol (a) *Beacons*

24 a/c took off, 21 completed their patrols, 2 returned early and 1 landed at Brussels, cause unknown at present and no report received. 4 A.I. contacts were obtained leading to chases but later lost, and one fleeting visual on 2 a/c believed to be hostile fighters.

Patrol (b) *Target Areas 7 Escort Bombers*

8 a/c took off and completed their patrols. 1 a/c got three backward A.I. warnings at the same time which lead to a dog fight which eventually was broken off. 10 minutes after breaking off this dog fight three more backward contacts were obtained in the same place, but these were lost.

Patrol (c) *Beacons*

2 a/c took off and completed their patrols. One A.I. contact was obtained leading to a chase but the target a/c drew away and was lost.

Patrol (d) *Dortmund*

3 a/c took off, 2 completed their patrols. One Monica contact was obtained and was lost.

Patrol (e) *Airfields*

13 a/c took off, 11 completed their patrols. 4 A.S.H. contacts were obtained all leading to chases. On one a fleeting visual was obtained on an unidentified a/c.

Night Fighter Support

F/L Howard and F/O Clay flew a very successful patrol. At 20.24hrs an A.I. contact was obtained leading to a chase, visual contact, and a combat in which an Me.110 was destroyed. Almost at once another contact was obtained leading to a chase on which a visual was obtained which was attacked and destroyed. Yet another contact was obtained leading to a chase of 25 minutes which this time, unfortunately, could not be overhauled. 2 Freshmen patrols were completed uneventfully.

2nd Phase (Operation)Patrol (f) *Escort Bombers*

4 aircraft took off and completed patrol. One a/c got several contacts at once and selected one, gave chase. At the same time three backward contacts were obtained, these were ignored for a short time but as they rapidly overhauled him, chase had to be abandoned.

Patrol (g) *Beacons*

7 a/c took off, 5 completed patrols. One suspicious A.I. contact was obtained and lost.

APPRECIATION

1st Phase

A preliminary analysis of the first phase of the night's activity shows that the long range night fighter operation was carefully planned and executed and that the object to confuse the enemy Controllers that their target was situated in the South was completely successful. Enemy night fighters from the Kitzingen/Ober Olm and Schwabish Hall area reacted as anticipated and the number of chases, about twenty in all, indicates that our fighters were in the right place at the right time. There were many instances of enemy Controllers broadcasting plots on our Intruder aircraft; one in particular, at 22.02hrs, reported a Mosquito over the Beacon Natchtigal – proof positive that our pilots had actually reached their patrol position. It is most encouraging that the preliminary contacts on the Me.110's destroyed by an aircraft of Bomber Support Development Unit were obtained by means of Serrate Mk.1V particularly as this equipment was invented, designed and manufactured in the Group itself. There is little evidence of enemy night fighters flying apart from the ones mentioned and consequently our Intruders operating over a wider field had no opportunity of destroying aircraft but their presence was a continual source of annoyance to the Raid Reporting Organisation.

2nd Phase

As will be seen in The Group Preliminary Narrative practically no night fighters opposed the second raid on Dresden; the only ones believed to have operated came from Finow and this was a belated and feeble effort. They were given no fighter instructions but merely plots on bombers in the target area.

Note:–

Since writing the above, confirmation has been received from Bomber Groups that hardly any night fighters were seen and practically no combats took place.

192 SQUADRON SPECIAL DUTY PATROL

- A. 1 Mosquito a/c carried out a Big Ben signals investigation patrol. No significant signals were intercepted.
- B. Mosquito “J” completed a combined W/T, R/T Piperack patrol (Dresden 1st attack) recordings were made of W/T on 41.1 Mc/s and R/T on 40.3 and 38.2 Mc/s.
- C. One Mosquito completed a patrol in conjunction with the attack on Bohlen and searched for evidence of Wurzburg transmissions in the band 400–450 Mc/s. There were no Wurzburg type signals intercepted below 450 Mc/s.
- D. One Halifax accompanied the Main Force to Bohlen, and searched the band of 30–70 Mc/s for evidence of enemy long range plotting signals. A preliminary examination of the results of the flight shows that no unusual enemy signals were intercepted.
- E. Halifax “T” (Bohlen) completed a Fidget investigation flight. Recordings were made of enemy M.F. beacon transmissions and 80 Wing Jamming Signals on the same frequency. A complete analysis of the results will be carried out at H.Q. No.100 Group and H.Q. No.80 Wing.
- F. One Halifax (Bohlen) investigated the 65–110 Mc/s band for A.I. signals. No signals of this type were intercepted.



MOST SECRET
SWANNINGTON 21 FEBRUARY

Interception/Tactics

Night of 13/14 February 1945

Target	Group	Target A/C	Target Sorties	000ft attacked	Missing	Height	T.O.T.
First Phase							
Bohlen	4, 6, 8		368	334	1 (.3%)	14-24 ¹ / ₂	21.54-22.12
	4	Halifax	211	188	1	15-19	21.54-22.12
	6	Halifax	115	108	-	14-20	21.57-22.11
	8	Lancaster	34	21	-	14-18	21.54-22.06
	8	Mosquito	8	7	-	18-24 ¹ / ₂	21.56-22.02
Dresden	5		254	244	1 (.4%)	1-16	22.03-22.28
1st Raid		Lancaster	245	235	1	10-16	22.03-22.28
		Mosquito	9	9	-	800ft	22.05-22.08
Magdeburg		Mosquito	62	61	-	11-26	21.30-21.41
1st Raid							
Nuremburg		Mosquito	8	7	-	33	21.59-22.15
Dortmund		Mosquito	6	5	-	28-33	21.01-21.06
Second Phase							
Dresden	1,3,6,8		551	524	4 (.7%)	7-21	01.21-01.55
	1	Lancaster	261	248	2	14 ¹ / ₂ -20	01.23-01.52
	3	Lancaster	162	151	1	15-21	01.25-01.55
	6	Lancaster	67	65	-	17-19	01.27-01.45
	8	Lancaster	61	60	1	7-19	01.21-01.45
Bonn Feint	8	Mosquito	16	16	-	18-22	00.14-00.24

Target	Group	A/C	Sorties	Target attacked	Target Missing	000ft Height	T.O.T.
Magdeburg	8	Mosquito	9	9	–	25–2	00.56–01.12
<i>2nd Raid</i>							
Misburg		Mosquito	8	7	–	27–3	01.30–01.47
Other Activity.							
Mosquito, Halifax, Stirling, Liberator, Fortress							
Bomber Support		100	117	107			
Signals		100	7	5			
Patrols							
Met. Recce		8	1				
Total			1,407	1,310	6 (.4%)		

Bohlen, Dresden (1st) Mandrel Screen

10 Halifax, 20.05 21.17hrs, 50.38N 05.40E–49.44N 05.43E, moving at 21.10hrs to 51.32N 05.30E–50.38E, jamming 21.50–23.00hrs.

Window

8 Halifax and 12 Liberators, made a feint against Mainz/Manneim area, 20.43–21.44hrs mean positions 50.00N 06.00E to points from 49.58N 08.10E to 49.25N 07.59E, thence to 49.25N 07.48E.

Intruders

High Level 56 Mosquitos; claimed 2 Me.110's destroyed North of Frankfurt, 19 other chases unsuccessful owing to interference.

Low Level 3 Mosquitos

Fighter Command Intruders. 21 Mosquitos High Level and 3 Mosquitos Low Level.

Jostle and Piperack, 7 Fortress and 1 Mosquito.

Security

Radar and Signals Silence to 06.00E.

Dresden (2nd) Mandrel Screen.

2 Halifax and 8 Stirlings positions as for 1st Screen. Jamming 23.50–00.30hrs and 01.00–02.30hrs.

Window

9 Liberators and 1 Halifax made a feint against Koln/Koblenz area 00.01–0.35hrs mean position 49.52N 05.50E–50.24N 06.33E jamming out to 50.50N 06.50E, 50.40N 06.56E and 50.27N 07.05E thence to 50.10N 05.00E ABC Lancasters were in the Main Force.

Weather

Bohlen and Dresden (1st)

9–10/10ths Sc. Tops 9,000ft some medium cloud at 15,000ft. Wind at 18,000ft 260/70mph. Route from French Coast 10/10ths cloud rising to 15,000ft in the frontal belt.

02.00–04.00E lowering eastward Icing in frontal belt. Return similar with little cloud west of 05.00E.

Dresden (2nd)

3–7/10ths variable drifting patches, tops 6,000ft. Wind at 20,000ft 265/85mph. Route clear to 04.00E then frontal belt with cloud to 17,000ft with rime and static breaking East of 09.00E to 3–6/10ths, tops 6,000ft.



Other Targets

Magdeburg

1st 9–10/10ths, tops 10–12,000ft.

2nd 10/10ths, Ci. tops 26,000ft.

Bonn

10/10ths Alt St. tops 12–15,000ft.

Dortmund

9–10/10ths St Cu tops 10/12,000ft and a St Cu layer tops 22,000ft.

Nuremburg

3–6/10ths tops 10–15,000ft.

Hannover

10/10ths tops 10,000ft.

Enemy Airfields

Mainly Fit, but rain and thick cloud in the Frontal Belt.

Enemy Fighter Reaction

Bohlen and Window feint 20.22–20.46hrs. 3JD control active 20.22hrs. 3JD plotted a/c SW of Vogelsang and W of Koblenz flying East. 20.31hrs 3JD plotted a/c NE of Limburg flying East. 20.45hrs 11 NJG 6 sent to a position between Karsruhr and Heilbronn. 20.53hrs 11 NJG 6 to Beacon Dachs (N of Mannheim). 20.55hrs 1V NJG 6 to Beacon Otto (Near Hannau). 21.02hrs 11 NJG 6 to Dachs at top speed. 21.05hrs 1V NJG 6 to a point 10 miles W of Mainz. 21.08 large formation plotted over a broad front W of a line Koblenz/Bingen. 21.08–22.13hrs Bohlen force plotted to the target area. 21.15hrs 11 NJG 6 told the Main Force was

probably flying East along the Latitude of Frankfurt.

Further plots on the Window feint 21.24–21.29hrs NJG

6 a/c to Beacon Otto. 21.35hrs 1V NJG 6 sent to the Kassel area but did not do so and at 21.37hrs were told to land at Kitzingen, as were 11 NJG 6 at Schwabish Hall. 2

recce a/c of 11 NJG 6 stayed up near Nuremburg till 02.45hrs. 22.04hrs plotting on the Bohlen raid between Jenna and NE Leipzig 22.13–22.29hrs plots on the homeward route and a route WNW to Kassel area.

Dresden 1st

20.26–20.28hrs 3JD gave plots in the Cologne area on a/c flying NE 21.02–22.31hrs plots as far N of Leipzig followed by a gap till 22.32hrs when bombers were reported leaving the target. 22.38–23.10hrs. 1JD plotted the return past Chemnitz to near Nuremburg. 23.15–00.25hrs heavy plotting from E of Nuremburg to Strasburg.

Dresden 2nd

00.22–00.57hrs Jafue Middle Rhine gave plots W of Koblenz on a/c flying East. 00.25hrs plot on eight four engined a/c 40 miles W of Mainz. 00.25–03.37hrs plotting on the Dresden route assessed at 00.52hrs at 300 a/c. 01.10 01.20hrs. Probably 1 NJG 6 made a second sortie and were given plots S of Weimar. 01.11hrs NJG 6 told the main attack was on Magdeburg. 01.23hrs all reported a/c flying towards Dresden. 01.48hrs NJG 10 given the target. 01.49–02.20hrs Jafue Middle Rhine gave plots between Chemnitz and Schweinfurt. 02.05–02.16hrs NJG 10 to land at Finow.



Attacks and Combats

Bohlen

Outward and at the target there were no combats. Homeward leaving Bohlen 22.00hrs 1 a/c attacked by unidentified a/c and 1 combat with a single engined enemy aircraft east of Bonn. 23.35hrs 1 twin engined aircraft attacked, and over Belgium 00.35hrs 1 unidentified aircraft was fired on.

Dresden 1st

Outward east of Dusseldorf 21.03 and 21.10hrs 2 combats south of Magdeburg 21.45 and 21.50hrs one attacked by twin engined a/c and 1 combat with a suspect jet a/c. 8 a/c reported seeing 4 jet a/c between 10.00E and the target but none attacked. A few twin engined a/c were seen near Leipzig and at the target. 22.09–22.19hrs 10 single engine and twin engined a/c were reported but there was no fire. Homeward no incidents.

Dresden 2nd

Outward approaching and crossing the Rhine 00.33 00.59hrs 3 attacks and 1 combat. South of Schweinfurt 01.03hrs 1 attack and on the next leg there was 1 combat with a JU.88 at 01.12hrs. Target area 01.34hrs 1 combat with a single engine a/c and 01.42hrs 1 twin engined a/c attacked. Homeward SE of Nuremburg 02.38–02.45hrs 2 U.88's attacked. S of Stuttgart 03.13hrs 1 combat with a JU.88 and W of Strasbourg 04.13hrs 1 combat with a twin engined enemy a/c.

Ground Defence

Bohlen 9–10/10ths

A few searchlights attempted to find cloud gaps. Heavy Flak was moderate at first, mainly predictor control unseen, and decreased during the attack. Guns from Zietz were in action. Few a/c were damaged.

Route:– Heavy Flak slight from Koblenz and Fulda.

Dresden 1st. 9–10/10

Markers at 800ft No Flak, No searchlights and Heavy Flak was negligible. 3 a/c were damaged.

Route:– Heavy Flak slight from Cologne when crossing the Rhine and Heavy Flak negligible N of Bittefeld.

Dresden 2nd. 3–7/10ths

No searchlights. Heavy Flak negligible. Barrage mainly below average bombing height.

Route:– Little opposition but a few a/c were engaged at Darmstadt, Zeitz, Chemnitz, Brux and Augsburg.



BAe/Boeing GR. Mk 7 Harrier, as deployed by the UK and USA (AV-8B Harrier II). Royal Air Force Harriers now regularly deploy aboard Royal Navy carriers in support of UN missions.



THE
**Supremacy
of
Air Power**

The following article was published in the April 1930 edition of Royal Air Force Quarterly. It provides an interesting insight into contemporary thought of the day. It is also prophetic in observing the part that Air Power would play in future conflict.

Dear Editor

DYou have asked me to contribute to your new Quarterly. First, may I congratulate you on its appearance, for not only was such a publication badly needed, but to me it shows that freedom of speech – or, shall I say, some freedom – is to become part and parcel of the Royal Air Force policy. You and your Service are in many ways to be envied; you have youth on your side, and that enthusiasm which is known to youth alone; also, you have three dimensions to move in; but even a greater asset than this is that you have no traditions, and, like Henry Ford, I trust that you have no intention of founding any. The future lies before you stretching vastly over the horizon, and air power is not yet twenty-seven years old; well can you let the past take care of itself. For the work you carried out so gallantly twelve years ago was nothing more than the play of the nursery.

We live in an extraordinary age, an age of wonders. A few weeks ago I picked up a copy of *The Daily Telegraph*, and as my eyes ran down its columns I noticed a headline, “New York to London in Six Hours”: a miracle twenty years ago, and today a possibility. The proposal was to build an aeroplane to carry passengers and a crew of 100. It was to cost £1,000,000; be propelled by twelve 1,000 horse power motors miles above the earth at a speed of 500 miles an hour.

In this same paper, the next day, I looked for further information on this wonderful machine, but found none; in place, a headline which caught my eye: “Strange Cult of Caruso.” Here I learnt that the embalmed body of the great singer is exhumed every three years and re-dressed by his sorrowing friends. “At present,” we are told, “he is wearing a frock-coat, and Tito Schipa says he looks well in it.”

Indeed, this age is an extraordinary one, a compound of the lowest barbarism and of the highest science. Of all those emotions which brutalize and make war, and all those exalted thoughts which, so I hope, will end way by debrutalization. When once we can breakfast in London, lunch in New York, and be back home again for supper, and all in twenty-four hours, it seems to me that life will become far too brief and exciting to wait for three years for the re-opening of any man’s grave in Naples or elsewhere, or to worry whether its occupant’s frock-coat is still of the latest cut.



What has all this got to do with you? Everything, for you are the heralds of a new means of movement, a means, so it seems to me, which is destined to change civilization, and with it the nature of war. And now to descend to my base of operations – mother earth.

Should armies remain more or less as they are, that is to say, infantry forces, with all the other arms harnessed to the infantry idea, then your military conquest will be an easy one, too easy even to make it exciting. Do not, however, be deluded by such possibilities, for change is inevitable. One reason for this is that no nation is again going to accept the infantry casualties of the last war. Another is that no air target could be more admirable than a long infantry column, with its impediments, its serfdom to road and railway, and its many semi-static headquarters. Yet another reason, and the most potent, slow-moving infantry can no longer protect the civil will.

Frankly, my concern for your future does not lie in this direction, it is to be discovered nearer home, for it is hinged on your own irrational, though obviously self-interested, actions. You struggle to take over the policing of uncivilized areas and the defence of coastal fortresses, when a child can see that you make the most indifferent of constables, and to restrict your mobility of sitting in Aden is almost a practical joke. But, after all, perhaps these are but back doors and badly-fastened windows leading into that great and ancient military mansion which one day you will claim as your inheritance.

It is, however, almost inconceivable that the soldier will for long continue to go on marching in this age of car and char-a-banc. Already has the writing appeared on the wall, and it reads, *Why walk?* Increasingly is infantry recruiting becoming more difficult, because we are ceasing to be a walking race. Industrialism means mechanization of military forces, whether soldiers or civilians want it or not. If armies are to continue to exist, then mechanization is as vital to them as today it is vital to you. Where you were thirty years ago we are today; then you were in balloons – the top of the winds; we are still on our feet – the plaything of roads and railways. If the army does not mechanize you will become the army, and the army will be swallowed by the police force, a force destined to walk until the crack of doom, an uncomfortable and unprogressive force, yet a highly necessary one.

Assuming that the army will be mechanized, and that it cultivates a mechanical spirit which has little to do with polo and hunting, and assuming that you have advanced in your search for plunder, no further than the kitchen and the offices of the military mansion, what influence is military mechanization going to have on you? Here is something much more entrancing than the straits of Bab-el-Mandib, the Kurram Valley, or the ruins round Mosul.

Before examining the influence of a mechanized army on your future, I think it is wise to consider mechanization from a general point of view. What is going to be its strategical influence?

Have we any foundation to work upon? Yes, the mechanization of the Navy some seventy years ago. I do not suggest that identical changes are going to take place, because nations live on the land and not in the sea, but I do suggest that, as navies



are the creations of industrialism, and that mechanized armies must also draw their strength from industrial power, there is a common link in the evolution of both.

To begin with, I will compare warfare at sea when warships relied on sail-power with warfare at sea as it is today.

First, what do we see? We see that the size of a nation has little to do with sea-power. Holland, Denmark and Portugal were once mighty naval powers, and even single cities, like Venice and Genoa, controlled formidable fleets. Warfare at sea was prevalent, and only two or three centuries ago incessant, for then piracy abounded. Nearly every type of sailing ship was a potential warship, consequently the power to indulge in naval warfare was the common property of maritime nations, great or small. Then came the steamship, and the whole of naval warfare changes. Special types of ships, and ships which are no use for commercial purposes are built, and only wealthy industrial nations can afford to build them. The influence on piracy, naval small wars, is most marked, so marked that today piracy is almost unknown. In sailing-ship days pirates could thrive; in steamship days they cannot. The influence of the steamship on great naval wars was equally remarkable, so remarkable that today only three or four of the greater industrial nations can contemplate naval warfare. The steamship has, in fact, very largely restricted war at sea; this has been its most important, yet least appreciated, influence.

To turn now to mechanized warfare on land. In this sphere of conflict is not there every likelihood of the petrol engine influencing the frequency of war as the steam engine influenced war at sea? Small wars will surely disappear. Small nations will not be able to indulge in war, for only the greater industrial nations will be able to afford it. The strength of armies will no longer be reckoned in terms of manpower but in machine-power; conscription of a nation's manhood will no longer be a measure of strength. Will not, therefore, land warfare become less prevalent? To answer this question we must examine the tactical side of mechanization.

Mechanized battles will depend on the nature of the enemy and the nature of the ground. Will the armies of today find any place in the future? We know that large tracts of country will always exist over which the mechanized armies will have the greatest difficulty in moving freely. Will not infantry still find a tactical playground here? I do not think so if we can imagine what a mechanized battle will look like. It will consist of a series of rapid manoeuvres, of feints, advances and retirements, followed by sudden and annihilating blows. Such battles will in one respect resemble actions at sea; they will be short and sharp, and not prolonged operations. A few hours may see the complete destruction of a large mechanized army, or its withdrawal to some land port, where it will risk blockade.

In such a war what use are infantry even if they occupy anti-tank positions? Should they become an annoyance their line of supply will be cut, and they will be besieged in their natural strongholds by tanks and aircraft. They will only be an encumbrance, and the little good they can do will be so outbalanced by the perpetual anxiety of supplying them that they will seldom be worth their pay.

Cut away the usefulness of infantry, and conscription has little reason to exist. The nation in arms, the creation of the Napoleonic wars, will become a thing of the past, and will give way to comparatively small long-service armies. The answer, therefore, is that



wars are likely to become less prevalent, petrol-power causing the same restrictions in land warfare as steam-power already has done in sea warfare. Further than this, possible theatres of war will shrink in size only such areas as are suitable for mechanized warfare becoming prospective battlefields. A country like Switzerland will practically be immune from war; even today few nations wish to fight in such a land, yet if Switzerland were to become pugnacious a few mechanized forces, by occupying its railways, could starve her out.

Mechanized warfare means fighting on the plains, therefore it is inconceivable that nations which possess great open stretches of country are not going to fortify them against mechanized attack. To maintain a superior mechanized army is not enough. Surprise is so likely, and battles may be so decisive, that no risk can be run.

Before we, as a nation, took to steam-power, our sailing ships could seek refuge in any sheltered cove. After it, defended harbours and coaling stations had to be constructed in every sea, so that our warships would possess bases of action to operate from, and harbours of refuge to refit it. In modified form, will not somewhat similar changes take place on land? Will not a nation more strongly than ever defend its frontiers, and will not these defences cover areas rather than occupy positions and block communications? Myself, I think they will resemble a broad net of works drawn out along the frontier, each knot representing an anti-tank fort or strong point.

It may seem that the cost of such a defensive system will be prohibitive, but I do not think that this necessarily follows, for a small concrete work with a gun in it is practically invulnerable to tank attack. Further, any stream, even at comparatively little cost, could be converted into an obstacle. Granted that such networks of defences are possible, then their influence on future tactics may be extraordinary.

To fight in one's own country has always been a much simpler operation than fighting in the enemy's. For instance, in the Civil War in America, though the Federals were vastly superior in numbers and equipment to the Confederates, the fact that they had to invade the South, and so constantly operate in an enemy's country, nearly cancelled out all these advantages.

Granted these fortifications, the picture now changes. Remember that on account of cost no nation is likely to have an enormous number of machines, consequently decisive battles will be avoided as they are at sea unless one side has a manifest advantage. Now if both sides be approximately equal, obviously the side which can make full use of its anti-tank defences as pivots of manoeuvre and shields against attack will possess an asset of almost incalculable value. Even if one side is considerably weaker than the other, when this side is able to fight within its own frontier, that is, within its defensive zone, the stronger side is not likely to attack it in a hurry, but to proceed methodically towards its objectives.

We see here a return to a new form of static or semi-static warfare, forgotten by enhanced mobility. Whilst in the past field armies frequently had to halt until their line of advance was cleared of a castle or a fortress, in the future, quite possibly, mechanized armies will have to halt until a whole area is cleared of anti-tank defences. The conclusion is, therefore, a dual one. Either the



invader will advance with extreme caution, or he will attempt to entice his adversary to abandon his fortified zone and enter his enemy's. In both cases there is likely to be a prolonged delay, and it is this delay which will bring to the fore the enormous offensive power of aircraft.

There is nothing new in this swing of the tactical pendulum. Mobile warfare always begets static warfare, and static warfare stimulates man's mind towards reinstating mobility. Thus Napoleon marched all over Europe; then by degrees bullet-power became so great that for three years during the World War we never marched at all. Static warfare begat the tank, and there can be little doubt that the tank will beget a new static war. Therefore, failing some unknown invention, it appears to me that this new static period will be solved by the mobility of the aeroplane, which can surmount all land defences.

If this is a correct judgment, then we may expect to see the following type of military organization. Whole countries, or their frontal zones, will be protected by anti-tank defences and fortifications. Within these fortified zones tank forces will be concentrated. The zone will be the castle of the past, and the tank forces their sally parties. Neither side will attempt to rush its enemy's castles, each will, so to speak, "sap" towards the other, will push forward slowly, and sallies will be made to frustrate this "sapping."

The true offensive arm will be aircraft. Their landing grounds and rear services will be within the fortifications. From these aircraft will be "fired" over the frontier against the enemy's vital points. It will no longer be a question of whether civilians can be attacked or not, for the land stalemate will justify any and all means of attack until civilized nations realize the folly of war, or a new static counter-agent is invented. In any case, when the civil will becomes a recognised objective, wars will still further be restricted. Thus we see, step by step, from flint axe to super-aeroplane, that every great tactical invention, instead of enhancing the god of war, undermines his temple.

Turning now from the speculative to the actual, are there any portents and signs which would lead us to suppose that the supremacy of the air is predestined? I think there are.

First and foremost, the third dimension to a large extent includes the second. Aircraft will, as far as we can see, be always influenced by gravity, but because they are all but influenced by water and land they have the power of rendering warfare far more simple.

Secondly, their great ally is the ether, they, born of the air, must court this still more attenuated element, for the ether is their true mistress, and once they have won her we shall see the birth of some strange children. The control of the ether is by wireless wave, an etheric vibration, the heart throbs of this great sorceress of future war. Today a wireless message can be sent from an aeroplane to a General many miles away. He compares the message with his map, dictates his orders, and sends them on by wireless to his troops. All this is a dual, there is no speculation about it, and the fact to note is the following importance of air power, and not the celerity of imparting information.

Now turn to information. The weak point is that it is far too slow. Let us, therefore, carry the system one step further, and make



not an altogether impracticable suggestion. Suppose the pilot had what I will call an automatic pointer, where he moves from place to place on his map, according to where he sees the enemy on the ground, and by a few Morse dots and dashes reports their strength and probable intention. Suppose that this pointer automatically sets in operation a similar pointer working over a similar map in the General's office, the General will at once see what the pilot or observer sees, then he can issue his orders almost instantaneously by another pointer to the pointers of his Subordinate Commanders. There will be much looking at maps but very little writing. The fact to note is the enormous importance of the pilot: he has become almost, if not quite, as important as the General, for should he make a mistake the General will repeat it; consequently, unless General and pilot see eye to eye, strategically and tactically, there are likely to be some terrible blunders. Surely, then, it would be better to fuse army and air force into one, so that a common education may be established. The weak point is two brains and not one brain.

Still there is another development you should examine. We know we can set in movement machines, coastal motor-boats and even battleships by wireless power. We know that throughout the history of war there has been a constant tendency to eliminate danger. Surely on many occasions it would be wise to use manless weapons as projectiles! For instance, we want to bomb a great city strongly protected by anti-aircraft defences, and we do not want to send two or three hundred brave men to certain death, besides, being human, they may prefer to live and not make quite certain of the city. So instead we send out 200 bombers, escorted by ten controlling machines. The bombers are unmanned and carry no bombs, for they are in themselves winged projectives, true aerial torpedoes. They are controlled by the ten machines, each of which is manned, and each of which by wireless directs the flight of twenty manless flying mines. As the city is neared and the air defence guns begin to fire, the ten controlling machines stand off and manoeuvre their projectiles towards their goal. Some are shot down, and as they strike the ground they disintegrate with terrific detonations; others move on, then dip, rush to earth and explode.

Expensive in aircraft you say? Certainly, but very cheap in human life. After all, an 18-inch torpedo costs, I believe, as much as a large aeroplane, and if the Navy can afford such weapons why should not the Air Force? And when the Air Force does afford them, perhaps the Navy will find that theirs are no longer required.

Should such a form of war be evolved? – and I see no logical reason why it should not – then turning back to that speculative, though probable static, war which is likely to follow fully mechanized warfare, I also see no reason to doubt in the future supremacy of air power.

Your future is not immediate; you cannot, like Minerva, spring full-armed from the head of Jove. Nevertheless, my opinion is that when once war on land is rendered really mobile, that is when armies become mechanized, a static period will follow, and that out of this period you will emerge and simplify war by annihilating it altogether.

Yours, etc.,

J.F.C. Fuller

The inter-war years are covered in the same depth through to the early war years – especially in the RAF’s ‘pilot only policy’ of the time. Once war started in earnest, the failure of bomber crews to find and attack their targets led directly to marked improvements in air navigation techniques and a change from the O-brevet to the now-familiar N. The controversy over whether the new brevet should be single or double-winged is discussed with the CAS of the time, Air Chief Marshal Sir Charles Portal, suggesting that the public did not understand the significance of the single wing. Again, this rhymes with the recent debate on the WSO concept.

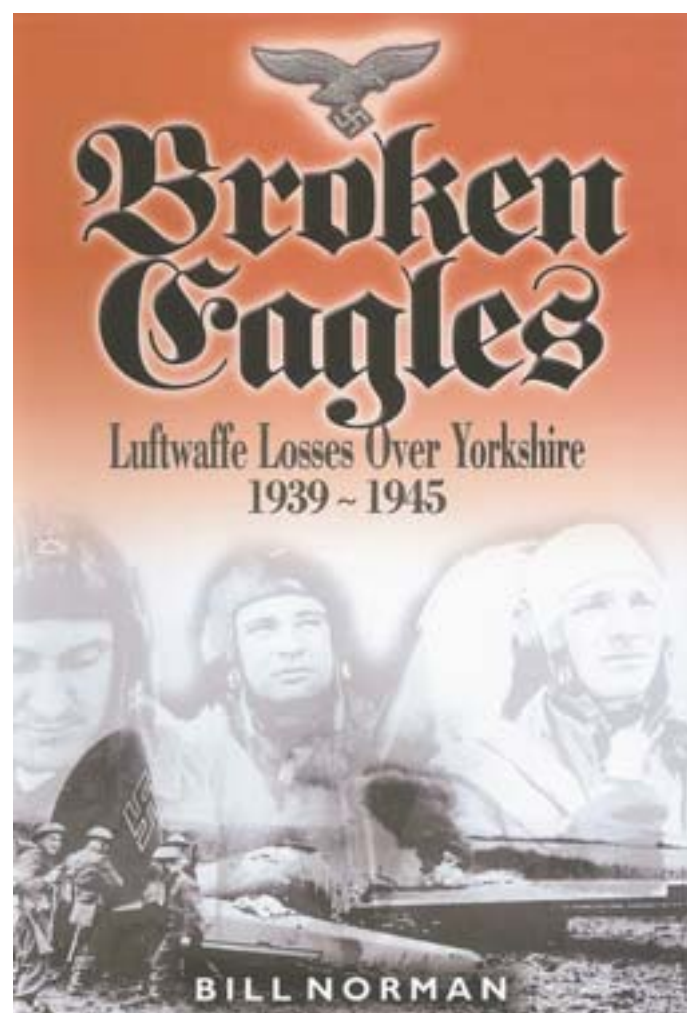
book reviews

Wing Commander C G Jefford MBE, BA, RAF (Ret'd)

Reviewer Gp Capt P.W. Gray

The title of this book, or more accurately its sub-title, describes exactly what it covers. The second edition updates the records of Squadron inventories and movements over the last thirteen years. With a plethora of similar books on the market, one could be forgiven for querying why this one stands out or why it should be updated. The simple answer to both questions is that it is the best available. The research is meticulous and the attention to detail beyond reproach. It therefore serves as a standard reference work for everyone from the casual reader through to the most assiduous of professional historians.

ISBN 0 85052 796 1; £19.95

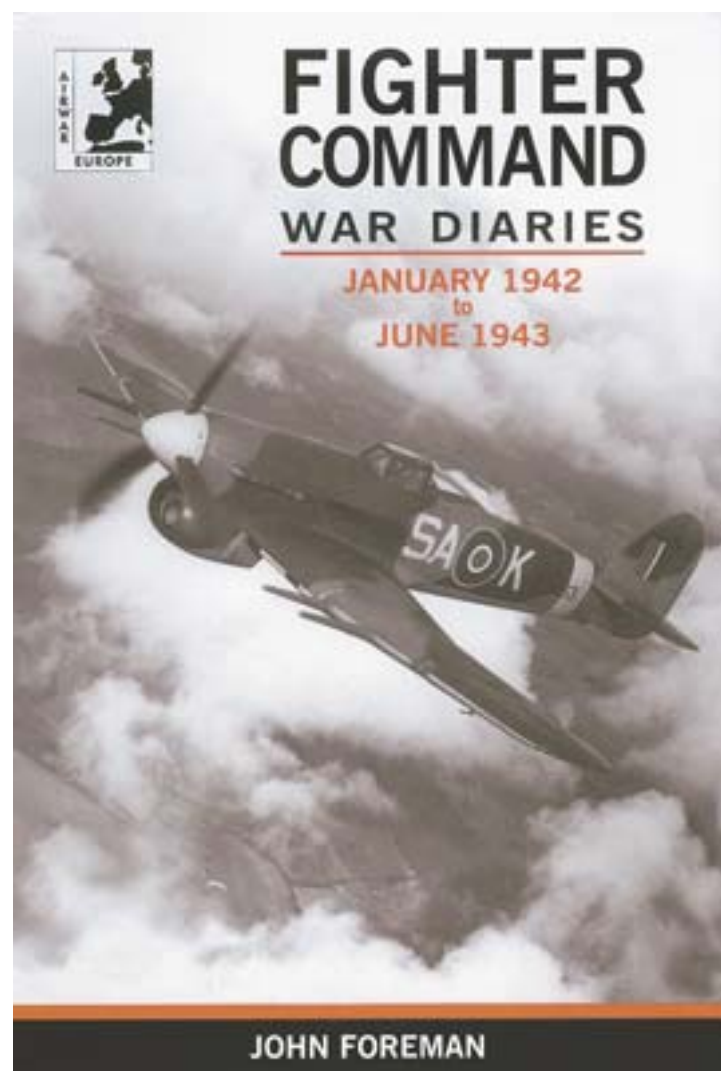


Broken Eagles will appeal not only to aviation enthusiasts and military historians but to those who now live below the Yorkshire skies where these battles were fought out to the death.

FIGHTER COMMAND - WAR DIARIES JANUARY 1942 TO JUNE 1943

John Foreman

ISBN 1 871187 39 7; £24.95



The third volume in this continuing series shows Fighter Command in its darkest hour. The introduction of the Focke Wulf 190 in the autumn of 1941 had come as a terrible shock to Fighter Command pilots. The Spitfire V, which had enjoyed parity if not outright supremacy over the Messerschmitt Bf109F was, at a stroke, completely outclassed. Professor Kurt Tank's new design was faster and more heavily armed than the Spitfire and the British losses soon became almost unsupportable. In mid-1942 the new Spitfire IXb began to enter service, but painfully slowly. Thus the majority of Fighter Command single-seat fighter pilots were obliged to carry on with the older version. The older Hurricane was still being used, but its usefulness as a pure fighter had gone. Instead, it was increasingly being used as a fighter-bomber, with bombs and later, rockets. But for this wonderful workhorse, *'the writing was on the wall'*. The new Typhoon, fast, heavily armed, was a purpose built assault aircraft and would supplant its older stable mate.

The year of 1942 was, perhaps, a time to match the sheer valour demonstrated during 1940. Dogged determination and courage saw them through into 1943 and, as the newer fighters arrived, so the carnage over France, Belgium and Holland began to diminish. 1942 was also the beginning of the great alliance between the British and the Americans, for the US 8th Army Air Force began to arrive later in the year. At first a trickle, but mounting into a veritable torrent, the combined forces were eventually to sweep the Germans from the skies.

The beginnings of this partnership were seen in 1943.

BRITISH AIR SERVICE MEMORIAL - ST OMER

The airfield of St Omer lies just 21 miles to the south of Calais. During the Battle of Britain it was the base for the Bf109s of Jagdgeschwader 51 operating over England in support of the Luftwaffe's attacks. However, the association with the Royal Air Force is much older. In October 1914, the Royal Flying Corps arrived at St Omer after months spent moving from airfield to airfield as the Western Front settled into stalemate. The town racecourse provided a base for several squadrons while a local chateau housed the Royal Flying Corps Headquarters. For the remainder of the war, the site was a major airfield and repair depot, such that Sholto Douglas, later Marshal of the Royal Air Force The Lord Douglas, was moved to call it the ***"Spiritual home of the Flying Corps"***.

A number of flying squadrons were first formed here, including Nos 9 and 16 Squadrons, while more than 50 other squadrons operated from the airfield at one time or another. At the formation of the Royal Air Force, on 1 April 1918, over 4,000 personnel were based at St Omer out of nearly 50,000 officers and airmen serving in France and Belgium. More than 8,000 casualties were suffered on the Western Front by the Royal Naval Air Service, Royal Flying Corps, Royal Air Force and air forces from the British Empire, including Major Mick Mannock VC, who was shot down on 26 July 1918 while on offensive patrol from St Omer. He has no known grave and is commemorated together with more than 1,000 missing airmen at Arras.

Today, there is still an airfield at St Omer, although a little distance from the old racecourse. Sadly, there is no sign that this was once the largest operational station on the Western Front, where the Royal Air Force was forged and first proved itself. In fact, other than the Memorial to the Missing at Arras, there is no physical monument anywhere in France or Belgium to the many thousands of Air Service personnel who served on the Western Front. The fleeting nature of the air war, allied to the short existence of the Royal Flying Corps and the Royal Naval Air Service, may provide some explanation for the omission, but visiting St Omer last year, I was struck by the absence of any indication that the airfield had once been a major airfield and depot, as well as the site of Trenchard's Headquarters.

To make good this oversight, it is proposed to erect a memorial at St Omer to those members of the British Air Services who served on the Western Front during the First World War. The French Authorities have indicated their support in principle and the attached artist's impression indicates how the completed memorial will appear when unveiled in 2003, the 85th anniversary of the Royal Air Force and the 100th anniversary of the Wright Brothers' first flight.

An Appeal Fund has now been set up to raise the £15-20,000 cost of the memorial and its long-term maintenance. Anyone wishing to contribute to the Fund is kindly asked to forward donations to:

Gordon Atkin
 'St Omer Appeal'
 12 Springwater Avenue
 Ramsbottom
 Bury BL0 9RH

Cheques and postal orders should be made payable to **Cross & Cockade St Omer Appeal Fund**. Receipts will be provided for all donations.



*Artist's Impression – Proposed Air Services'
 Memorial St Omer*



ROYAL AIR FORCE HISTORICAL SOCIETY

Registered Charity No 299029

ELECTRONIC WARFARE

A seminar to be held at the Royal Air Force Museum,
Hendon on Wednesday, 10th April 2002

The proliferation of radio/radar-based communications and detection, navigation and bombing aids from 1939 onwards gave rise to an entirely new form of warfare based on the exploitation of the electronic spectrum while attempting to deny the enemy the same advantage. This seminar will trace the evolution of 'EW' within the RAF during WWII and much of the Cold War. To attend please:

1. complete and return the tear-off section below, along with
2. a **self-addressed stamped envelope** (for your Receipt/Booking Confirmation), and
3. a **cheque for £15** made out to the RAF Historical Society.

Travel: The nearest underground railway station is at Colindale which is about half-a-mile from the Museum.

Parking: Ample car parking space will be available.

Security: Please bring with you your Booking Acknowledgement/Receipt *and* your RAFHS Membership Card.

Catering: Morning coffee will be available before the seminar and there will be a finger buffet at lunch time.

Capacity: It is not anticipated that there will be any need to place a limit on attendance. It will, however, be necessary to confirm the catering arrangements by **2nd April** after which it is regretted that it will not be possible to make refunds in the event of a member being obliged to withdraw.

Timing: The Seminar will begin at 1030hrs. Coffee will be available from 0930hrs.

PLEASE RETURN THE SECTION BELOW

To: Gp Capt K J Dearman, 1 Park Close, Middleton Stoney, Oxon, OX25 4AS.

Name..... Date Address

(BLOCK CAPITALS THROUGHOUT PLEASE)

I shall be attending the Seminar and enclose a cheque for **£15** and an **SAE.ST. CLEMENT DANES, STRAND, LONDON**

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14 May & 15 May 2002

Speakers from the United Kingdom,
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CENTRAL CHURCH OF THE ROYAL AIR FORCE

This beautiful Wren church, which is also the Royal Air Force Central Church, has a world-wide following and is open daily from 08.30 am – 4.30 pm. There is Choral Eucharist or Matins every Sunday at 11.00 am, sung by the famous choir. Civilians and all members of the Armed Forces are welcome to visit the church and attend the Services.