

THE ROYAL AIR FORCE

AIR POWER

Review

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Royal Air Force AIR POWER Review

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Foreword from CAS

**Air Chief Marshal Sir Peter Squire
KCB DFC AFC ADC FRAeS RAF**



I am delighted to provide this foreword to the Air Power Review. This is the eighth edition of the Review and the publication continues to go from strength to strength, providing an important forum for air power debate and generating interest in air power matters wherever it is read.

During my tour as Commander in Chief Strike Command, I was directly involved with the generation of air power and, during our operations in the Balkans, the Middle East and East Timor, its application in some of the most demanding of circumstances. But while these examples represent the output end of air power and clearly demonstrate the capabilities of modern aircraft and their weapon systems, it is important to remember the many other factors that are required to ensure that air power is effective. People are a vital part of the equation because without the right number of personnel, correctly trained, motivated and directed, the best equipment in the world would be useless. In turn, doctrine is an important part of the people process, shaping our thought processes and helping to ensure that our limited assets, both equipment and personnel, are used efficiently and effectively. And, just as our equipment continues to develop and improve in capability, and the circumstances in which we are asked to operate differ in geography, climate and political context, then so our doctrine must be dynamic in order to retain its relevance.

The Air Power Review has established itself not only as a first class and respected publication but also as a vital part of the doctrine development process; stimulating thought, debate and I suspect even argument. I also hope it has been entertaining – I have very much enjoyed the articles in previous editions and I thank those who have contributed their work. Which brings me to my final point: doctrine belongs to us all and we all have a part to play in ensuring its continued development. So, enjoy this latest edition of the Review but do join the debate – the more that contribute the healthier it is, not just for the Air Power Review but more importantly for air power in general.

Peter Squire



INTRODUCTION BY DIRECTOR OF DEFENCE STUDIES (RAF)

On 15 March 2000, Air Chief Marshal Sir Richard Johns launched the Royal Air Force Strategic Plan at the RAF College Cranwell. The cornerstone of the Plan is the Royal Air Force Vision which envisages, *inter alia*, an Air Force that is both trained and equipped to generate air power; it must also be modern and flexible while remaining proud of its heritage. The Strategic Plan goes on to charge the Director of Defence Studies (and the Air Warfare Centre) with carrying out conceptual work on the use of air power in future conflicts and leading in the development of air power thinking and doctrine within the military and academic communities. The Air Power Review provides an excellent long-term vehicle for fulfilling each of these objectives.

The first article ensures that we are up to date with important changes in the Alliance; it has been provided by General Gregory S Martin, Commander US Air Forces in Europe and Commander Allied Air Forces Central Europe. He outlines the new NATO structure and discusses the implications for Air Command and Control. An important element is the ongoing work aimed at developing a deployable Joint Force Air Component Command with manpower taken from within existing NATO personnel.

In the second article, I have sought to stimulate debate on the use of air power in future conflicts – albeit only within a ten-year timeframe – other work on the evolution of warfare extends out to 30 years. Part of the debate centres on the likely defence missions ten years hence; it also touches on the extension of air power into the realms of space. For nations such as the United States, this has already occurred and can be taken as a given. Our USAF equivalent journal, for example, has already been re-titled as the *Aerospace Power Journal*. The extent to which the UK follows suit in the utilisation of space will depend on a number of factors not least of which will be funding. Nevertheless, we cannot afford to ignore developments in the military and civil exploitation of space, or in the conceptual thinking that underpins its use.

The next article has been submitted by Wing Commander Colin Reeves; it covers the topical and important question of recovering downed aircrew. The author covers the historical background of rescuing aircrew including US experiences in Vietnam where the USAF lost one crewman and two aircraft for every 9.2 rescues. Wing Commander Reeves then goes on to discuss the associated dilemma as to the balance of risk likely to be faced by the rescuers compared to those on the ground. This debate is extended into the difficult area as to the degree of financial investment expected of a government once the capability has been demonstrated and public (and press) expectations raised.

The fourth article is by Duncan Bell and covers the use of air power for strategic coercion. Mr Bell bases his essay on the US experiences in Vietnam, in particular the two major operations – Rolling Thunder and Linebacker. He then goes on to give a brief summary of the strategic use of air power and the competing theories of coercion. Mr Bell then applies the theory to the two Vietnam campaigns. Finally, he highlights the importance of developing a sound and cohesive doctrine and applying this, where appropriate, to the conflict as it progresses – having taken into account the vital lessons of history on the way.



Dr Grant Hammond, conversely, warns us of the perils of identifying the wrong 'lessons' from a conflict. Many of these 'lessons' may have been based on misconceptions in the first place. An ideal example of this is the perception that the Gulf and Kosovo conflicts were wars dominated by precision weaponry. The CNN footage of cruise missiles and cockpit videos leave us with an indelible impression of the exclusivity of these weapons. The reality was that only some 5% of weapons delivered in the Gulf were precision guided and 35% in the Kosovo air operation. Although this article originally appeared in the USAF Air Power Journal (Fall 1998), it makes salutary reading in the wake of another major campaign.

The sixth article has been submitted by Wing Commander 'Moose' Poole and covers the use of information warfare as part of the so-called 'revolution in military affairs'. This article has been based, in part, on an essay Wing Commander Poole submitted as part of his MA in Defence Studies programme during his Staff College course. The article is particularly useful in that it gives a UK perspective on a subject that frequently raises images of anorak-clad hackers, but seldom receives the due level of analysis. Wing Commander Poole takes the whole debate further with, to choose a small example, the real concerns over the proliferation of computer scientists in Islamic or Hindu countries mirroring the numbers of chemical specialists that were trained in Western Universities in a previous generation. Notwithstanding the inevitable tendency for information operations to be subject to extensive caveats and codewords, it is vital that all military planners include information warfare in their deliberations at all levels of warfare and this article goes a long way in stimulating a very necessary debate.

The need to understand and appreciate our military heritage is ably catered for in the penultimate article submitted by Wing Commander Philip Greville. His title – The Forgotten Aviators – highlights the lack of recognition of the role played by air power in the Korean conflict. Wing Commander Greville covers the full range of aviation activity encompassing the Fleet Air Arm and the Army Air Corps as well as the Royal Air Force.

In the final article, Group Captain Mike Harwood has taken the longstanding principles of war as the basis for a thought-provoking review of the strategic factors likely to influence those involved in the direction, command and control of military power. His article serves to highlight the importance of everyone involved in the delivery of air power taking ownership of, and with it the responsibility for, the vital process of conceptual thinking. Only by doing so will we be able to accept the challenges set before us in the Royal Air Force Vision and Strategic Plan.



CONTRIBUTIONS TO ROYAL AIR FORCE AIR POWER REVIEW

The Royal Air Force Air Power Review is published under the auspices of Director of Defence Studies (RAF) and has the sponsorship of 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.

Quality contributions from both service and civilian authors are sought which will contribute to the 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.

Articles should be original and preferably not previously published, although this will not exclude publication in the Air Power Review if the material is considered to be of sufficient merit. The length of articles may vary from as little as 2,000 to an absolute maximum of 10,000 words. Each author will receive a payment of £200 when the article is published. Assistance and research for photographic, illustrative and diagrammatic information can be provided, but design format and graphic presentation of material on page will be at the discretion of the Editor. Lengthy articles so considered may be published in multiple parts. Bibliographic and other references should be included as end notes to articles. Contributions from serving military personnel should be in accordance with DCI GEN 313 dated 26 November 1999 (Clearance Procedures for Dealing with the Media and Other Public Speaking and Writing). Contributions from serving Royal Air Force personnel must be approved by Publications Clearance Branch (Air), Ministry of Defence, 3-5 Great Scotland Yard, London, SW1A 2HW.

Submissions can be accepted as typed copy or in a variety of electronic IBM or Apple Macintosh based formats on 3.5 inch floppy disk. A numbered page print out of all text should be accompanied by illustrative, diagrammatic, photographic or other graphic material intended to illuminate the article. Please send your material to:

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NEW BEGINNINGS



The New NATO Structure
and its Implications for
Air Command and Control



The “Peace Divided”

Last year we celebrated the 50th anniversary of the North Atlantic Alliance; an era which saw the beginnings of NATO against the backdrop of the Berlin Airlift, the long tensions of the Cold War, and finally, the break up of the Soviet Union with the dramatic collapse of the Iron Curtain. For 50 years collective defence was the bedrock of our alliance and the clearly identifiable monolithic threat from the East put our daily operations and doctrine into sharp focus. This was a demanding, but in retrospect, a relatively predictable and stable state.

Paradoxically, the new strategic environment has brought with it extensive change and a dispersed, multifaceted threat; the anticipated “peace dividend” of widespread stability that so many had expected from the removal of the Iron Curtain is not readily apparent. The dawning of the new millennium finds the world amid increased turmoil and instability and therefore sees us as NATO partners with great responsibilities for international stabilisation.

NEW STRUCTURE

In response to our changing environment, just one year after the accession of Poland, the Czech Republic and Hungary, the North Atlantic Alliance in Europe moved from 3 to 2 regions on the 3rd of March this year – Region North and Region South, divided by the Alps. The number of NATO Headquarters fell from over 60 to just 20 as we created a leaner structure more focused on the changed threat and better able to rapidly respond to the more diverse responsibilities demanded of the Alliance today. This change has chiefly affected Northern Europe which was formed by the amalgamation of the old AFCENT and AFNORTHWEST to form the new AFNORTH. The regional air headquarters, HQ AIRNORTH, is located at Ramstein in southern Germany.

This article will look at how the new, leaner, more flexible structure of AIRNORTH will better cope with the great challenges that the new millennium will give us, in terms of a closer Air Command and Control (C2) relationship, an Air Policing Structure across the whole of the Northern Region, and enhanced flexibility and deployability.



CLOSER COMMAND AND CONTROL

The Combined Air Operations Centres, CAOCs, (which total 5 in the new structure, together with one deployable CAOC) are the execution arm of COMAIRNORTH, the Regional Air Commander, and are responsible for the daily tasking, control and assessment of air missions from the flying bases across the region. One critical aspect of the new NATO structure is that CAOCs have, for the first time, become permanent detachments of HQ AIRNORTH. This direct link to the staffs directing them, both in peacetime and times of crisis, will ensure that the CAOCs are more focused as an execution system and ready to act rapidly. This offers us the opportunity to perfect a leading principle of airpower: centralised control, decentralised execution. HQ AIRNORTH will centrally control air power region-wide, whilst the CAOCs will execute in a decentralised manner in accordance with the operational objectives set.

An important step in developing flexible, focused and reactive CAOCs has been the standardisation of their manning and structure. By ensuring that all CAOCs, no matter what their peacetime responsibilities, are structured and manned to a NATO-wide common standard, we create a “plug and play” structure which allows individual CAOCs to seamlessly receive or provide augmentation or support from outside.

The dawning of the new millennium finds the world amid increased turmoil and instability...

Manning standardisation also allows for the CAOCs, their staffs and augmentees to train in depth to a NATO common standard. All CAOCs and CAOC personnel, from Reitan in Norway to Eskesihir in Turkey, will operate to the same CAOC operating guide. Common standards, structure, manning and training across NATO will mean CAOCs will be capable of rapidly expanding or augmenting other CAOCs, secure in the knowledge that they are intimately familiar with their common duties and tasks and are established to tactically command air assets wherever required.



AIR POLICING

The air policing picture across the Northern Region has changed greatly in recent years; firstly, with the accession of Poland and the Czech Republic and secondly with the amalgamation of the old AFCENT and AFNORTHWEST AORs in the new NATO structure. Nevertheless, we have successfully created a stable Recognised Air Picture (RAP) across the entire Region, with the promise of many more advances in capabilities imminent. Already we see Polish and Czech units under the tactical control of the multinationally manned CAOC 2 in Kalkar and CAOC 4 in Mestetten respectively, with secure horizontal and vertical communications connectivity.

Cross Border Air Policing has been extremely successful between Germany and the Benelux countries; the expansion of this process will continue, as we progress towards seamless, borderless region-wide

...we have successfully created a stable Recognised Air Picture (RAP) across the entire Region, with the promise of many more advances in capabilities imminent

interoperability for all our CAOCs and fighter aircraft. Key in the advancement of this goal will be the adoption of Region-wide common readiness states and the maximum possible standardisation of weapons loads.

This will enable us to utilise our assets with total flexibility as we police the skies across the whole of the Region, from Northern Norway to Southern Germany.



The core manpower for a JFACC would come from key staff within HQ AIRNORTH, augmented by trained external personnel...

ENHANCED FLEXIBILITY AND DEPLOYABILITY

Key within Northern Region Air C2 developments, is the extensive work being undertaken in the area of the Joint Forces Air Component Command (JFACC). The JFACC is the Air Component of the Combined Joint Task Force (CJTF), which would be set up and deployed wherever required to fulfil NATO duties. HQ AIRNORTH is the centre of expertise for the NATO JFACC concept and has been the spearhead of the development of NATO JFACC doctrine and procedures for higher approval. Currently, we are identifying and defining individual positions within the JFACC and are training individuals accordingly. The core manpower for a JFACC would come from key staff within HQ AIRNORTH, augmented by trained external personnel depending on the nature of the operation and the required size of the JFACC.



This powerful JFACC capability would deploy with an integral execution arm, an Air Operations Centre (AOC). The AOC would comprise elements of CAOC 2 at Kalkar together with the USAF 32nd Air Operations Group based in Ramstein as well as augmentees from other CAOCs and nations. Well equipped, trained, exercised and evaluated, the AIRNORTH JFACC represents a formidable Air C2 capability – light and lean, ready and able to deploy within hours to command air power worldwide.

NEW AIR FOR A NEW EUROPE

The first bold steps towards a leaner, more flexible structure have been taken. Poland and the Czech Republic are well on the way to being fully integrated into the new AIRNORTH structure, which encompasses the old AORs of the Northwest and Central Regions. As NATO in Europe adopts its new, 2-region structure it will be better equipped to face the changed threat of the new millennium. The closer, more pro-active relationship with our execution arms, the CAOCs, will ensure our readiness to act decisively in the future. The continued development of our air policing system will provide seamless, harmonised security throughout the whole Northern Region. The progression of the JFACC concept, together with the dedicated training and resourcing of a JFACC here at Ramstein, promises a formidable capability ready to command air power wherever and whenever required. There are doubtless many refinements yet to be made on this bold journey, but together with our new member nations, we have set the foundations for rapid and meaningful progress. Our new Air C2 structure will give us the opportunity to ensure that NATO seizes its chance to adopt its role as a peacemaker, a peacekeeper and a major international influence for stability.



Air Power or Aerospace Doctrine 2010?

Military doctrine is by definition historical

Professor Richard Overy¹

Professor Overy went on to postulate that doctrine tended to become an end in itself, rather than a means to an end. He graphically describes doctrine as tending “to solidify, like a slowly moving lava flow”². It could therefore be argued that, at best, doctrine is examined on an occasional basis to see if the latest minor conflict has washed up any earth shattering revelation that necessitates a review; otherwise events are shoehorned into the existing mantra. At worst, the body of doctrine becomes so old that it is rendered totally meaningless, worthy neither of being taught (the simple dictionary definition of doctrine) nor useful as a broad based source of reference. This state of affairs is by no means impossible to reach. Any lengthy period of stability could result in a force becoming stultified, both in terms of its equipment programme and its thinking. In such circumstances, redundant legacy equipment and doctrine become less and less relevant: complacency reigns.

Historical examples of this state of affairs abound. The Royal Air Force, in the inter-war years, owed its existence to the doctrine of the strategic bombing offensive. Under the charismatic leadership of ‘Boom’ Trenchard, air power was considered to be an exclusively offensive weapon; the best, indeed only, way to defend the United Kingdom was to attack the enemy on his airfields, in his factories and in the heart of his homeland. The development of fighter aircraft (and doctrine) was eschewed as being neither practical nor necessary. Even when the Spitfire, Hurricane and Radar (then RDF) appeared on the scene, their effective deployment was mired in dogma.³ This was in marked contrast to the flexible approach to doctrine adopted by the Luftwaffe.⁴

Professor Overy suggests that doctrine must therefore be the subject of almost perpetual review – it is not ‘inscribed in stone’ (successive authors of AP 3000 probably, however, have it inscribed on their hearts). It is incumbent on us all to play an active part in this review process; we must all apply constant and critical interrogation. This paper contributes to that debate. It is not, however, an attempt to predict the future, nor even to build a series of semi-convincing scenarios. Nor does the paper attempt to enter the debate on the existence, or otherwise, of the so-called Revolution in Military Affairs. Neither doctrine nor the ensuing debate should presume to tell



elected governments the way in which they should organise defence policy. Rather, the paper looks at how warfare **may** develop over the next decade, and how the armed forces of the United Kingdom may be called upon to react. For reasons of coherence, this section has been structured around the main Defence Missions outlined in the Strategic Defence Review.⁵ The paper then goes on to look at the main core capabilities of air power as evolve to match the potential changes in the challenge detailed in AP 3000, British Air Power Doctrine⁶ outlining how doctrine may have to of tomorrow. The possible doctrine that emerges does not, in a paper of this length, cover all possible eventualities or attempt to re-write AP 3000.

EVOLUTION OF WARFARE

One of the inherent requirements for the armed forces of any country is defence against strategic attack. SDR phrased this task as being in the NATO context.⁷ It is not unreasonable to assume that NATO will remain in existence until at least 2010, possibly (indeed probably) enlarged even further. Strategic attack was not in prospect in 1998 when the Review was published and there is little to suggest that it will be any more likely in 2010. As the realities of an open market continue to ravage the Russian economy, the chances of sufficient funds becoming available merely to maintain force levels let alone re-equip appear minimal. China may grow to become a peer competitor, but is unlikely to present a threat to NATO. Even apparent truisms such as this must be regularly reviewed. Recent press articles suggest that China is well advanced in its development of anti-stealth technology with long term implications for allied capabilities wherever they may be deployed.⁸ It will therefore be incumbent on any government to maintain a full cross section of the main military capabilities from which larger scale forces can be generated. Maintenance of the nuclear deterrent will continue to fall within this category.

Regional Conflict within NATO remains a distinct possibility with Article V action the most likely mechanism. Russian adventurism on a large scale has already been effectively dismissed. But border incursions, or more likely, spillover from ethnic conflict in almost any of the minor republics that border NATO cannot be ruled out; this is particularly pertinent on the borders of Turkey where conflict would take place on and over difficult terrain. The United Kingdom will almost certainly maintain a full range of capabilities to support NATO operations in anticipation of such a contingency. The most frequently required force package will increasingly consist of a relatively light, mobile force that could be deployed quickly. The fastest way of demonstrating offensive military capability will be by air and it is obviously through this medium that early entry forces will travel. This will have ramifications on the force structure of all three services as will be discussed in due course.

Regional conflict outside NATO is the most probable contingency of any great scale in which United Kingdom forces are likely to become embroiled. The Gulf is almost certain to remain central to national political and economic interests. And it is unlikely to have become more stable by 2010. By the same token, conflict in North Africa or the Near East could generate sufficient

heat for our vital national interests, or those of our allies, to be affected. These potential threats to stability would again require the early deployment of mobile, combat capable forces. As ever, the quickest 'bang for your bucks' would be through the immediate use of air power. For this to be effective, maximum use would have to be made of ISTAR

assets, appropriate support aircraft – all preferably coordinated with allies. With the growing importance of, and authority for,⁹ opposed humanitarian intervention, the future force structure will need to retain the capabilities necessary to fulfill a wide range of possible missions.

It is almost inconceivable to imagine that United Kingdom participation in *peace support and humanitarian operations* will have significantly diminished by 2010. Whilst it may sound somewhat cynical to suggest that we will not have found our way out of either Bosnia or Kosovo by then, the realities of the Balkans are that only a massive boost to the individual economies will assuage the bitterness of the recent decades. Black market economies run by mafia-style organisations do not inspire confidence or movement towards stability unless considerable IMF assistance is used to change the whole system; Russia is an unimpressive example. A combination of factors such as the proliferation of media interest, the increasing desire of the



The fastest way of demonstrating offensive military capability will be by air and it is obviously through this medium that early entry forces will travel



United Kingdom government to be a force for good in the world and a widening worldwide poverty gap will ensure that ‘small scale contingencies’¹⁰ will remain high on our agenda. SDR was predicated on our force structure supporting one full scale or two medium scale operations (one of which would be war fighting and not rouled – i.e. less than six months duration).¹¹ It may be that by 2010, the United Kingdom’s involvement in small scale contingencies will have a far greater impact on force structure with assets such as strategic lift, satellite communications equipment (and the necessary staff), electronic warfare systems and so forth forming the critical path. Remedying such shortfalls obviously will not be cost free. But the alternative course of action – opting out of participation in conflict resolution in a particular theatre – may not be reconcilable with UK foreign policy objectives.

Defence Diplomacy will remain an important means of achieving the Government’s foreign and security policy objectives. It includes, at present, an enhanced arms control programme, outreach, education and training. It may well be that air and space reconnaissance assets will be increasingly used in the first of these areas. Note, for example, that the USAF uses satellites and a modified Boeing 707 aircraft for atmospheric testing¹² in support of Open Skies monitoring. The definition of defence diplomacy as being conflict prevention, offered by Secretary of State, George Robertson, will remain as valid in 2010 as it was during the SDR process.

Support for wider British interests, along with maintenance of the *Security of our Overseas Territories*, will ensure that world wide deployability will remain integral to force structure planning. The impact of multiple operations – real or potential – will continue to stretch our forces.

Peacetime Security embraces a wide range of tasks from supporting strike-bound civilian fire services through counter-terrorism to activities such as counter narcotics operations. By 2010, this will almost certainly include defensive, and probably offensive, information operations.¹³ These extend far beyond the ‘bogeyman’ computer hacker threat that flares periodically in the popular press. Damage can be done to information storage systems, to the equipment itself and to the wider community at large. The scale of the potential damage to a nation’s financial system is so great that state sponsored information operations could easily lead to retaliatory action – either by force or in kind.¹⁴ Inter-departmental co-operation in this field will be vital. A further, and not inconsiderable, threat to peacetime security is the growing risk of asymmetric warfare.¹⁵ The theory of this is that Western (i.e. predominantly US) superiority in conventional weaponry, technology and assets leaves the third rate foe – who may well not be a state actor – with no means available to join the contest. The foe therefore exercises leverage through terrorist style

Peacetime Security embraces a wide range of tasks from supporting strike-bound civilian fire services through counter-terrorism to activities such as counter narcotics operations

attacks, possible on the homeland. These attacks could conceivably include the use of Weapons of Mass Destruction.¹⁶ Countering the manifold manifestations of such a threat is, of course, hugely difficult – assuming that it is possible at all. Increased emphasis again on ISTAR assets appears inevitable. Furthermore, the armed forces would need to retain the ability to cope with the aftermath of any attack from the wide spectrum of aggression available to asymmetric warrior.

AEROSPACE POWER

The 2010 definition of Aerospace power could be as follows:

The ability to achieve politically desired effects by the projection of military force in space or in the air, by or from a missile or platform operating above the surface of the earth. Air platforms are defined as any aircraft, helicopter or unmanned air vehicle. Space assets are differentiated from air platforms by being non-air breathing.

Military force includes all of the civilian elements such as contractor support that are required to sustain air or space operations. At present, the United Kingdom's equipment programme suggests that an extension of operations into space is still some way off; it is, however, a reality in the US.

The successful employment of aerospace power is predicated on two related, but distinct, theoretical loops. The first of these is based on the all-encompassing notion of effects based warfare – which by 2010 will be fundamental to our thinking at all military levels. This notion will have moved on from the concept of effects based warfare which holds, for example, that a power station can be closed down with a precise strike on the control room as effectively as if it were to be obliterated.

Historical concerns over the need to minimise friendly casualties, reduce the potential for collateral damage, avoid wanton damage to enemy property and even to guard against unnecessary enemy casualties are accentuating the dominance of effects based warfare. Prior to US involvement in Somalia, domestic audiences were relatively ambivalent to the possibility of casualties. Scenes depicting US servicemen's bodies being dragged through the streets of Mogadishu led to immediate presidential and domestic revulsion, followed by rapid withdrawal. This, combined with an apparent arcade game lack of reality in the presentation of air power, has resulted in a public expectation that all operations could be achieved with clinical precision.

Scenes depicting US servicemen's bodies being dragged through the streets of Mogadishu led to immediate presidential and domestic revulsion, followed by rapid withdrawal

The 2010 definition of Aerospace power could be as follows:

The ability to achieve politically desired effects by the projection of military force in space or in the air, by or from a missile or platform operating above the surface of the earth

This perception will be enhanced by the advent of further high technology weapons systems such as the Airborne Laser (ABL) which will be used to detect and shoot down ballistic missiles in their boost phase; the potential deployment of space based weapons systems will reinforce this trend. By 2010, much of the emotion surrounding the weaponisation of space will have receded. In 1999, General Joseph W Ashy, former commander in chief US Space Command, stated:

‘It’s politically sensitive, but it’s going to happen. Some people don’t want to hear this, and it sure isn’t in vogue... but – absolutely – we’re going to fight in space. We’re going to fight from space and we’re going to fight into space.’¹⁷

More detailed examples of the extent to which the ‘sanctuary’ of space will have been militarily utilised by 2010 are covered below as extensions to the core capabilities sections.

If we assume that total war is unlikely to re-emerge in the conventional arena (i.e. non nuclear exchange between peer competitors), it is improbable that decimation of enemy territory en bloc would be envisaged. In limited conflicts it is quite feasible that coalition partners will seek to have a truculent leader either coerced or replaced. Damage done in the process would almost certainly have to be made good by the attacker and the erstwhile target population would become tomorrow’s market, trading partner or ally. Notwithstanding the international legal or ethical considerations, it is therefore incumbent on those responsible for formulating the campaign to reach a suitable conclusion as quickly and as painlessly as possible. The only way that this can be achieved is by evaluating the required effect that the commander wishes to have on the target regime. An accurate assessment of the enemy’s weaknesses must therefore be made first. This may be the enemy’s centre of gravity in classic Clausewitzian terms. Equally it may be the seams between elements of his organisation – targeting these may result in paralysis of his structure or dismemberment of command and control. It is vital that this analysis is conducted with regard to the enemy’s own perceptions: the early days of Rolling Thunder were littered with examples of planning a campaign based on Western perceptions rather than those of the enemy. For example: planning to concentrate attacks on the North Vietnamese industrial base had minimal effect on the country as whole and on the people in particular;¹⁸ the North Vietnamese leadership did not ascribe the same degree of worth to its industry as the West would have done in similar circumstances.

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Having identified the effect wanted, the commander then has to analyse which target sets could be attacked, with the weapons available and within the Rules of Engagement, to produce this effect. The targets are in turn attacked and the effect assessed. It is critical that this analysis goes beyond mere counting the number tanks that have been 'plinked'. If the enemy has not reacted in the way that had been predicted, the commander and his staff must re-assess in that light and work a new way of achieving the desired effect. If the decision making cycle is to be kept to a minimum, the more that is known and understood about the target regime the better. Shifting rubble from side of a ruined car park to the other does not constitute attacking for effect – although this may be desirable, for example, for intra-alliance media consumption, or as part of information operations. As we may have a (single) centre of gravity at the strategic and operational levels, so this theory of attacking for effect is relevant at both levels. Indeed, it is also pertinent at the tactical level. But this is not new; in 1944, Liddell-Hart stated that 'the real target is the mind of the commander, not the bodies of his troops'.¹⁹

The second, and closely related, cycle with which we must be concerned is the classic Boyd OODA loop in which we Observe enemy movement, Orientate friendly forces, Decide on a course of action and then Act.²⁰ By 2010, the timescales within which we can complete this cycle will, hopefully, have contracted considerably. The ultimate ideal must be for friendly forces to get within the decision making cycle of the man with the machete! This cycle will always be dependent on the rules of engagement and any political constraints extant at the time.



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INFORMATION EXPLOITATION

Throughout history, a combatant without knowledge of the whereabouts of his foe (and ideally his intentions) is doomed, at best, to impotence and more likely to annihilation. From its inception, air power, and subsequently space assets, have provided the commander the opportunity of unique access to information. This gives the commander the scope to observe the enemy's physical and electronic dispositions. The enemy's intentions may, by 2010, be increasingly vulnerable to allied inspection. The greatest challenge facing the commander in 2010 will be the need to fuse the information obtained from a plethora of sensors and ensure that it is made available to a range of recipients from planning staff through to the weapon systems operator in the shortest possible timeframe. This may be the pilot of a Joint Strike Fighter, the ground based operator of an unmanned combat air vehicle (UCAV), a laser operator through to a soldier on the ground. This is, and will continue to be, a multi-faceted problem. At one end of the spectrum, the JSF pilot's information requirements will vary, possibly from second to second depending on the stage of the mission and the immediate threat situation. The means of transmitting information will need to be sufficiently robust to withstand enemy information operations; these could cover the full gamut from traditional electronic warfare through electro-magnetic pulse explosions (Radio Frequency Weapons) designed to damage electronic components to cyber attacks on software. The need to keep vital data bases secure will be mutually exclusive to the desire to have close allies operating as part of the system.²¹ Sharing classified, codeword bearing, material around within one nation has proved difficult enough without trying to obtain wider clearances for allies.²²

Space operations will play an increasing role in the provision of near real time information to commanders at all levels. Existing access, already impressive by 1999, will be further enhanced with the ability to deploy mini-satellites from the Common Aerospace Vehicle (CAV).²³ The well-understood concepts of protecting conventional intelligence gathering assets, and denying the enemy use of his vehicles will extend to space resulting in an inevitable militarisation²⁴ of the last frontier.

From its inception, air power, and subsequently space assets, have provided the commander the opportunity of unique access to information

CONTROL OF THE AIR AND SPACE

The need to protect ones own space assets, and if necessary attack those of the bad guy, will equally inevitably move the war in the air into space. The USAF already has an F15-borne anti-satellite system. Other potential systems include a co-orbital satellite equipped with an explosive warhead or anti-satellite mines.²⁵ For every offensive system deployed, a potential adversary whose finances permit this sort of warfare, would have to field a defensive mechanism. This level of Star Wars may be beyond

most nations. But the scope for information operations should not be underestimated – particularly against commercial satellites the performance information for which is readily available on the Internet.

Within control of the air is the denial of that medium to the enemy. This therefore includes some form of anti-ballistic missile (ABM) defence as well as the more conventional forms of ground based air defence. Mention has already been made of the ABL (used to detect and shoot down ballistic missiles in their boost phase). An integrated and layered ABM and conventional defence system would include the assets from each of the services deployed to a given theatre – or indeed in defence of the home nation.²⁶

Notwithstanding the costs of these systems, the USA is not alone in developing and deploying them; Israel has test fired the Arrow missile as part of its Citron Tree anti-tactical ballistic missile system.²⁷ Our own SDR declined to commit the UK to the expense: by 2010, we may need to have done more than ‘Monitor the risks posed by ballistic missiles’,²⁸ particularly if proliferation of ballistic missiles continues at the present rate. This is highly likely as it offers the would-be pariah with a relatively (certainly to the cost of the counter measures) cheap asymmetric threat to major powers. Control of the air also encompasses countering the burgeoning cruise missile threat.²⁹



STRATEGIC EFFECT OF AEROSPACE POWER

Air and space operations for strategic effect are aimed to identify and then destroy or disrupt the defined strategic centre of gravity (weakness, seam line or whatever) of the opponent. It need not be destructive: it could be economic, social or political. The aim is to undermine the opponent's will, ability and means to continue the fight. This is the use of air and space power at the highest level, with heavy emphasis on effect rather than destruction. By 2010, the availability of precision weapons, delivered by stealthy aircraft, or from space platforms will be such that desired psychological impact will be greater than had been possible – even though advocates of air power have long cherished this as a Holy Grail.³⁰

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JOINT FORCE EMPLOYMENT

As the first decade of the 21st Century progresses, budgetary constraints will ensure that the armed forces will have to continue to work closer than ever together. Union of the forces would be so anti-synergistic that contemplation of such a course should be left to the musings of academia (and in more formal circles elsewhere in London). The introduction of Joint Force 2000 and the Joint Helicopter Command, however, are almost certainly the way ahead for other capability areas. If such knowledgeable advocates of air power, and international affairs more generally, as Air Marshal Sir Timothy Garden can see an ever increasing role for a European defence identity, the chances are that by 2010, at least some of our support for air operations will be shared across key allies.³¹ Any return to a more isolationist posture by the US would only accelerate this movement. Key areas for increased co-operation include air-to air refueling;³² air transport (especially for the insertion of mobile combat troops); anti-submarine warfare operations; and anti-surface operations. Joint electronic warfare (and SEAD) would be more difficult, despite the crying need for an expansion in this area of capability. The security difficulties alluded to earlier in this paper again come into play. But suitable 'firewalls' in our, and US, systems should be able to cope with this problem. The USAF, partly to reduce their footprint overseas, and partly to reduce reliance on host nation support, has moved towards an Expeditionary Air Force concept.³³ This carries with it a sizeable bill in terms of tanker assets and strategic lift. There is also a price to be paid for long range weapons systems whether conventional (such as the B2) or space based.

The last twenty years have seen European air forces, in conjunction with American counterparts of all air arms, take major steps forward in their ability to produce complicated attack packages for use against a wide range of targets. Realistic training on courses such as the Tactical Leadership Programme and on Red Flag, combined with real experience of combat, must continue – especially as the increasing array of sensors, platforms and weapons systems will need to be blended together. The air interdiction role, SEAD and even possibly close air support may be carried out by space-borne weapons. The synergy of the coalescence of the many and varied platforms could well be lost if stringent efforts are made to ensure that they are exercised together, and with representative command and control decision making.

CONCLUSION

This paper has sought to stimulate debate as to what aerospace doctrine may look and sound like in 2010: it may or may not replace straight air power doctrine depending on how much we decide to expand our frontiers. We may choose not to invest in certain areas of technology. But the relevance of combined, or coalition, operations will remain such that our doctrine will need to encompass these areas so that we will at least be able to understand the full spectrum of capabilities and where our forces

fit into this. The paper is by no means a prediction of the future. Nor does it purport to be the first draft of the next strategic defence review, or of the fifth edition of AP 3000. That said, the span of new, or advanced, technologies that we will need to embrace will be so broad that serious decisions will be needed over what we will elect to do ourselves and what we must attempt to share with allies (formally or otherwise). Merely monitoring the progress of key weapons systems will only serve to exasperate key partners such as the US as the gap between their and our capability will inevitably broaden. This is the subject of some concern now;³⁴ 2010 may be too late to play catch up. By the same token, it is incumbent on all sides to close the gap and US reluctance to release codes and key equipments (especially in the communications area) does not help.

Some authors have sought to question, even denigrate, the future role of air power.³⁵ The counter argument is that the reach, ubiquity and flexibility inherent in air power and enhanced by a reasonably affordable use of space will continue to be invaluable to a commander of any cloth. By 2010, host nation support for forays abroad to counter evil will not be as forthcoming as it has been over the last decade. An expeditionary military capability in general and a deployable air force in particular, (along the lines being developed the USAF)³⁶ is absolutely dependent on the force possessing the right blend and quantity of air and space assets. The use of aerospace power for effect rather than destruction will serve to make it ever more the politician's weapon of first choice. But the fuel that makes the whole machine function is a living and relevant doctrine without which we will become fossilised in Professor Overy's lava flow.

NOTES

- 1 Richard Overy, *Doctrine Not Dogma: Lessons from the Past*, *RAF Air Power Journal*, Vol 3, No 1, page*.
- 2 Ibid, page*.
- 3 For a scathing review of this calamitous state of affairs the reader could do worse than look at A J P Taylors introduction to Len Deighton, *Fighter*, Pimlico, London, 1996, page xv. See also Alfred Price, *The Hardest Day*, Janes Publishing, London, 1979, page 41.
- 4 James S Corum, *The Luftwaffe: creating the operational air war 1918-1940*, University Press, Kansas, 1997, page 124 et seq.
- 5 *The Strategic Defence Review*, Cm3999, London, 1998, Chapter 3. (Henceforth cited as 'SDR')
- 6 *AP 3000, British Air Power Doctrine*, Third Edition, HMSO, London, 1999.
- 7 SDR, page 16.
- 8 Matthew Campbell, 'Chinese radar may trap stealth planes', *Sunday Times*, 28 November 1999, page 25.
- 9 Group Captain Bill Boothby, 'The Use of Force to Prevent a Humanitarian Disaster' *RAF Air Power Review*, Vol 2 No 4, page 68.
- 10 This is a term widely used by US force planners. They work on a force structure capable of supporting two near contemporaneous major theatre wars (MTWs); all other adventures are SSCs.
- 11 SDR Supporting Essays 6-3.
- 12 William B Scott, 'USAF Nuclear Detectives Assume New Roles', *Aviation Week & Space Technology*, November 3 1997, pages 50-59.
- 13 See for example, Martin C Libicki, *What is Information Warfare?*, Centre for Advanced Concepts and Technology, National Defence University, Washington, 1995. See also, Andrew Rathmell, 'Mind Warriors at the Ready', *The World Today*, November 1998, page 289.

- 14 The Clinton Administration's Policy on Critical Infrastructure Protection: Presidential Decision Directive 63, dated 22 May 1998.
- 15 See for example, Lawrence Freedman, 'Britain and the Revolution in Military Affairs', *Defence Analysis*, Vol 14 No 1, 1998, page 58.
- 16 Andrew Rathmell, *Future Patterns of Military Conflict*, Ditchley Conference Report D97/15, page 3.
- 17 Introduction to a CADRE paper by Major William L Spacy USAF, *Does the United States Need Space-Based Weapons?*, Air University Press, Maxwell AFB, Alabama, September 1999.
- 18 Mark Clodfelter, *The Limits of Air Power: the American Bombing of North Vietnam*, The Free Press, New York, 1989, page 140.
- 19 Basil Liddell-Hart, *Thoughts on War*, Faber & Faber, London, 1944.
- 20 This theory has been reiterated many times; it is quoted for example in AP 3000, *British Air Power Doctrine*, third edition, 1999, pages 2.4.1 and 2. The difference between the OODA loop and the loop described earlier is that the new model takes the cycle to the highest levels of political military decision making. The emphasis on vulnerability and intentions at the political level takes the discussion onto a different plane. Arguably the two loops are intertwined rather than being the same beast.
- 21 Natalie Crawford, 'The Impact of Technology in the Next Century', in Shaun Clarke (Ed) *Testing the Limits: the Proceedings of a Conference held by the RAAF in Canberra*, March 1998, pages 27,28.
- 22 Richard P Hallion, *Storm over Iraq; Air Power and the Gulf War*, Smithsonian Institution Press, London, 1992, page 204.
- 23 Boeing publicity material.
- 24 For a description of the use of laser anti-satellite weapons and satellite jamming in USAF wargames, see Lieutenant Colonel Mark P Jelonek, *Toward An air and Space Force; Naval Aviation and the Implications for Space Power*, CADRE Paper, Air University Press, Maxwell AFB, Alabama, September 1999, page 57.
- 25 Spacy, *ibid*, pages 24 and 25.
- 26 David Gates, 'Countering Aerodynamic and Ballistic Missiles: Extended Integrated Air Defence', *RAF Air Power Review*, Vol 1, No 1, 1998, pages 59-70.
- 27 Clifford Beal, 'Israel's Citron Tree system bears fruit' in *Jane's Defence Weekly*, 8 July 1998, page 17.
- 28 SDR Supporting Essays, page 5-15, paragraph 45.
- 29 For a useful review of the progress made in this field in comparison with the ballistic missile threat see Dennis M Gormley, 'Hedging Against the Cruise-Missile Threat', *Survival*, Spring 1998, page 92-111.
- 30 For the further potential of high technology in this field see, Malcolm R Davis, 'Valkyries of Tomorrow's Air War; Hypersonics and Aerospace Operations in the 21st Century', *Air International*, September 1998, pages 176-180.
- 31 Air Marshal Sir Timothy Garden, 'A Need for a European Air Power', *RAF Air Power Review*, Vol 1 No2 Autumn 1998, pages 1-11.
- 32 Interoperability, or certainly cross-training, is already well advanced in this area. During the Kosovo air operation, some 85% of non-USAF AAR was carried out by RAF tankers.
- 33 General Michael E Ryan, USAF Chief of Staff, in his address to a Conference held by the RAAF in Canberra: *New World Vistas: USAF Air and Space Power for the 21st Century*, in Shaun Clarke (Ed) *Testing the Limits: the Proceedings of a Conference held by the RAAF in Canberra*, March 1998, page 13.
- 34 Take, for example, Secretary for Defence William S Cohen's remarks to this effect in his key note address to the IISS Annual Conference, 9 Sep 99.
- 35 See, for example, Martin van Creveld, 'The rise and fall of air power', *MHQ – The Quarterly Journal of Military History*, Spring 1996, Vol 8, No 3, pages 76-81.
- 36 General Michael E Ryan, *ibid*, page 13.



EH 101 Merlin. A Joint British-Italian collaborative programme, to replace RAF Wessex and Puma aircraft within the RAF. Merlin will also replace Sea King aircraft in the Royal Navy.



DOWNED AIRCREW

Does their value to the military machine mean they should be recovered irrespective of the cost?

Since the origin of man and the existence of independent states, conflict has been a means of resolving disputes. As empires grow, every Great Power is suspicious of any likely or even unlikely rival. What seems defence to one will always appear as an aggressive preparation to another.¹ Prisoners of War (POW) have been a feature of any conflict since wars began, whether it be their treatment by the opposing force or the impact of the loss of trained personnel to the military machine.

The advent of air power introduced a new dimension to war with operations conducted beyond the front line. To counter the new threat, enemy air defences became more sophisticated and despite improved self defence capabilities on aircraft, the likelihood of crews being shot down became greater than ever. At the same time, the cost of training aircrew has increased significantly, with the result that aircrew are now one of the most precious commodities on the battlefield. Furthermore, the introduction of female aircrew has added another dimension to the debate on the treatment and rescue of POWs. Another issue to be considered with modern conflicts is the technological advances of the media. Has the advent of reporters onto the battlefield, with their real-time information service, created greater pressure to rescue downed aircrew?

As highlighted in the Strategic Defence Review (SDR), the future concept of operations for the UK Armed Forces will be expeditionary² in nature. In view of the anticipated short term conflicts or peace keeping/peace support operations coupled with today's climate of financial constraint, does the value of aircrew justify the significant cost and effort of a rescue operation particularly if the treatment of POWs will be in accordance with the Geneva Convention?³ If so, should the rescue operation be expeditious and at the expense of other operations? Additionally, as the UK is unlikely to act independently, should the resources required and conduct of the task be under national, joint or coalition arrangements?

Vietnam, April 2 1972: a pair of USAF EB-66 electronic warfare aircraft, BAT 21 and BAT 22, were flying electronic jamming missions in the de-militarised zone (DMZ) against the North Vietnamese Easter Invasion. The aircraft came under sustained attack from surface to air missiles (SAMs) and, as reported by Major Ed Anderson, the Electronic Warfare Officer on BAT 22:

*'The pilot reported seeing SAM missiles detonating, at which time I called, "SAM visual, vicinity of DMZ" ... At the bottom of the SAM break, I dispensed 15-20 bundles of QRC 530 Chaff. The 2 guidance signals B606s were up together from 10-15 seconds. I never had any indication of Fansong Track While Scan signal....'*⁴



...missiles were aimed at BAT 21 and scored a direct hit bringing the aircraft down. The sole survivor then became the focus of the single, largest combat search and rescue (CSAR) mission during the Vietnam war

“interviews” with downed aircrew from the Coalition Forces, including RAF officers John Peters and Adrian Nichol. The broadcasts had the opposite effect that the Iraqis had hoped for. Although intended to dissuade Allied air forces from further action, the condition of the captured aircrew hardened opinion, not only amongst Coalition Forces, but also the rest of the international community and, more importantly, the public in the Allied countries. Although the pictures confirmed people’s worst fears, they were seen to be reassuring. As recalled by

During the Gulf War in 1991, the Iraqi Government chose to televise “interviews” with downed aircrew from the Coalition Forces, including RAF officers John Peters and Adrian Nichol

The missiles were aimed at BAT 21 and scored a direct hit bringing the aircraft down. The sole survivor then became the focus of the single, largest combat search and rescue (CSAR) mission during the Vietnam war. As summarised in the account of the rescue:

‘After 11½ days trapped behind enemy lines, BAT 21 Bravo was returned to friendly control. But the cost was high. Among the soldiers and airmen, 10 men were killed working or supporting the SAR; one other was rescued, 2 were captured but later released and one was still evading. On the ground, several members of the recovery team were injured. Six more aircraft were shot down and numerous others were damaged, some so badly they would never fly again. More than 800 strike sorties, including B52s, were flown in direct support of this mission.’⁵

Why was the rescue of one man worth so much? Was it the fact that the American public had the war broadcast live into their homes every night?, Government concern over the “body-count?”⁶ or the public concern over the treatment of POWs because of the reports that had been televised?

However, the rescue of downed aircrew or concern over the treatment of POWs was not an issue peculiar to Vietnam. During the Gulf War in 1991, the Iraqi Government chose to televise



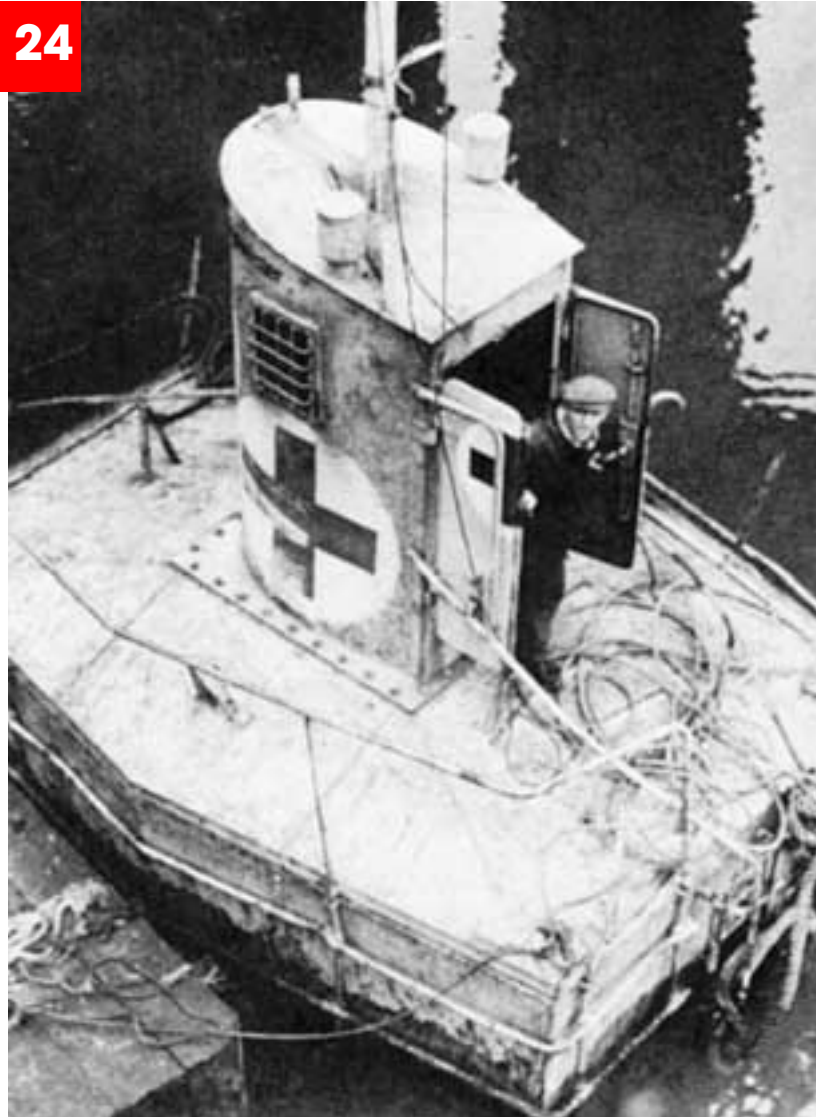
Squadron Leader Bertie Newton 'I was certainly convinced that if you were taken prisoner, you wouldn't get out alive from Iraq. I was very glad when I saw the 2 guys on television, I thought fine, excellent – because they've been on television they're the most likely not to get topped'⁷. In Vietnam, the media reports worked against the American Forces whereas in the Gulf, they worked for the Allied military. So what impact has real time media reporting had on the treatment of POWs and how will it affect conduct of operations in the future?

As in the case of BAT 21, there has always been a requirement to rescue downed aircrew because of their value to the military machine and the need to have as many aircrew available to fly as possible. Moreover, the morale of crews flying over enemy territory is maintained by the knowledge that if they go down, their colleagues will be coming to get them. This paper will summarise the history of the rescue service, including CSAR, consider the need for a dedicated CSAR capability and consider how the UK might provide CSAR facilities.

SEARCH AND RESCUE

*'On the 23 April 1944, Lieutenant Harman of the US Army Air Force piloted a Sikorsky YR-4 and rescued 3 British soldiers and an American airman from the jungles of Burma.'*⁸

During the Second World War, in an attempt to recover downed aircrew, both Britain and Germany formed rescue services. Initially, rescues were conducted on an ad-hoc basis but, by the end of the war, specially formed units on land, sea or air were carrying out skilful rescues in all areas of the world using equipment designed specifically to overcome problems in the various theatres.⁹ Whilst the introduction of the first practical helicopter during World War II provided a new means to rescue downed aircrew, the origins of the service started some 11 years previously when the Germans established a small fleet of boats for the rescue of downed airmen. In 1939, the Germans modified some of their older Heinkel 59 float planes specifically for the air sea rescue role and fitted them with medical equipment, respirators, electrically heated sleeping bags and a floor hatch with a hoist. The Germans also developed rescue equipment such as inflatable dinghies and a fluorescein dye to stain the water around the dinghy bright green enabling them to be seen more easily by rescue aircraft. Also, large buoy floats were positioned in the Channel and North Sea to provide a safe haven for any downed aircrew. These floats had blankets, dry clothing, food, water, flares and lamps stored on board and were regularly checked by patrols from either side. The British approach was more relaxed with their search and rescue system based on RAF high speed boats or any other units that might be available. Some improvement was made in early 1940 when a communication system was established that gave priority to distress messages,¹⁰



...the requirement to rescue every downed aviator during the Battle of Britain resulted in the establishment of a joint RAF/RN rescue organisation in Aug 40

and the requirement to rescue every downed aviator during the Battle of Britain resulted in the establishment of a joint RAF/RN rescue organisation in Aug 40. Subsequently, a Directorate of Air-Sea Rescue was formed to develop and co-ordinate all air sea rescue methods. During the war, Coastal Command was responsible for saving 5,721 Allied aircrew forced down in the sea between Spain and Norway.¹¹

Similar developments occurred in USAAF and USN theatres of operations, many of which were to provide the foundations for improvements in rescue services for other conflicts. However, during the Second World War, concepts and capabilities of rescue were aimed primarily for water recovery. A major development was the introduction of modified B17s which carried a 27ft powered boat complete with survival stores. These aircraft accompanied the bombers, circled just off the coast waiting for the aircraft to return and then assisted any which were damaged and had to ditch, dropping the lifeboat as necessary.¹² The need for a land rescue capability led to the development of the helicopter as a rescue machine and the first squadron was formed in

China in May 1945. Air rescue had improved to the point that with good planning and advantageous positioning of the rescue force, most combat crews could reasonably expect to be recovered.

Further advances in SAR came during the Korean war. Early deployments of helicopters in the SAR role were soon increased, as these machines proved so effective. Unlike the Second World War where aircrew shot down behind enemy lines were almost certainly captured, the helicopter became indispensable in recovering crews. In 3 years, over 10% of downed aircrew were rescued from behind enemy lines. However, the helicopter was vulnerable, lacked range and was susceptible to ground fire. These difficulties were reduced by the introduction of newer and more capable helicopters. The French faced similar problems in Indochina. The disadvantage of the helicopter was soon recognised but their only counter was to fly higher. Of all the helicopters used by the French, virtually all were hit by small arms fire although only 2 were known to have been shot down.¹³

The first use of fighters to escort helicopters was developed during the Korean War – CSAR had been born. Developments by the US continued between the end of the Korean War and their involvement in Vietnam. However, most of these rescue efforts focused on recovery of crews and equipment from the space programme and these developments were to prove woefully inadequate under combat conditions in the South East Asia conflict. Here, the jungle canopy rose as high as 250ft making parachute descent dangerous and rescue very difficult. Helicopter crews started carrying long ropes to lower through the foliage to assist with rescues. These were superseded by the introduction of the “penetrator” which cut through the jungle canopy. The survivor was then recovered by winch.

Procedures were also developed to counter the Vietcong use of survivors who would be left alive at the crash site in an attempt to entice rescue units in so they could also be attacked. The tactic was initially very successful and to overcome this, on being advised that an aircraft was down, the US would establish an exclusion zone around the crash site and all available assets deployed to recover the crew. The area would be strafed and cleared by fighters before helicopters were authorised in for the rescue. The number of aircraft and personnel involved in such rescues was significant and it was also claimed that the diversion of these assets impacted on other operations. Following the rescue of BAT 21 and the high cost paid, the exclusion zones were significantly reduced and aircrew were advised that whilst rescues would be made, it may not be as immediate as before.



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The USAF lost one SAR crewman and 2 aircraft per 9.2 rescues in Vietnam – a very high loss rate of 22%

Thus, operations went away from immediate rescues to carefully planned and co-ordinated operations fully supported by fighter assets. However, the costs of these rescues were high. The USAF lost one SAR crewman and 2 aircraft per 9.2 rescues in Vietnam – a very high loss rate of 22%.¹⁴ The procedures have been refined over the intervening years but the principles remain the same. CSAR is now a feature of any war and must be conducted in a well planned, controlled and executed operation. There is no place for an ad-hoc gung-ho approach to the rescue of downed aircrew. That said, following the shooting down of a Blackhawk helicopter in the Gulf War, a reckless rescue mission was launched and resulted in further casualties and prisoners of war.

AIRCREW TRAINING

As stated earlier, aircrew training has increased in terms of cost and complexity over the past 20 years. In the UK, training to “award of wings” for a fast jet (FJ) pilot takes 121 weeks and costs approximately £1.0M. Add to that the 20 weeks of training on an Operational Conversion Unit and the 36 weeks to attain a full operational category, a total time of 3¹/₂ years and a cost approaching £3M is reached.¹⁵ Despite several studies under recent defence reviews, it has proved impossible to reduce this period or cost. Indeed, when this has been attempted, the reductions made have had to be reversed within 2 years as the

failure rate and the need to give students additional flying increased significantly. Thus, the value invested in FJ aircrew is immense and this value increases over time as operational experience, improved airmanship and graduation to formation lead and flight commander status is gained and these cannot be replicated quickly. On current return of service figures, the average FJ pilot provides 9 years' service in return – a cost of £333.3K per year. Add to this a capitation rate of £45K per aircrew Flight Lieutenant and the value of each individual becomes considerable. Moreover, in a modern conflict, the time taken to train replacements would undoubtedly be longer than the actual operation. Whilst it could be argued that aircraft take longer to replace than training time for new crews, the ratio of crew to aircraft (2:1) mean that this is not a significant factor in a short term conflict. Therefore, it is essential to recover downed aircrew whenever possible.

Many in the American military believe that the unrestricted media access and the resulting hostile public opinion undermined the US war effort in Vietnam



MEDIA IMPACT

Technological advance has not just been limited to air power. In Korea, media technology was not sufficient to allow live broadcasts and this allowed censorship of material although there were some independent journalists not subject to this control. On the other hand, however, the free reporting during the Vietnam War coupled with the advance in technology played a significant part in that war. Many in the American military believe that the unrestricted media access and the resulting hostile public opinion undermined the US war effort in Vietnam.¹⁶ Additionally, this was the first time that live pictures of a war were transmitted directly to American households, thereby raising concerns over the morality of the war. Even in modern conflicts, there is still difficulty over media access. The military will often consider journalists' requests for information as unreasonable and a threat to the operational aspects of the war whilst, on the other hand, the journalist will see the reluctance of the military to provide details as censorship. Free-lance reporters will be on the battlefield irrespective of whether they are authorised or not and they have the capability to transmit information as and when they wish. Whilst accredited journalists may show restraint in



Television reporting of war has turned it into a spectator event that can be confused with Athletic contests

reporting details of CSAR type operations, this is not the case for all. Reporting of downed aircrew will not only result in pressure from home to mount a rescue but will also provide the opposing force with information. Modern media has also played its part in peace support operations such as Somalia and Bosnia. With real time reporting, the media has brought the shock and horror of situations into the homes of the population who then demanded action. The military option is seen as the easiest and deployment of forces followed quickly in both situations. The media are on hand to transmit live pictures of events as they occur. In Somalia, the body of a dead American crewman was dragged through the streets in front of the World Press. In Bosnia, the pressure to rescue Scott O'Grady was intensified by the media reporting. As stated by author Ross Perot, 'Peace keeping missions can turn into all-out war, even if only for a short period of time' and 'Television reporting of war has turned it into a spectator event that can be confused with Athletic contests. Peace keeping missions, when they become war, exact a terrible price.'¹⁷ The reality of peace and war is available at a moment's notice. The demand to recover trapped personnel is highlighted by the camera which leads to more pressure to conduct a rescue operation.

CSAR

NATO defines CSAR as: 'the detection, location, identification and rescue of downed aircrew in hostile territory in crisis and wartime and appropriate isolated military personnel in distress who are equipped and trained to receive CSAR support, throughout a joint Operations Area.'¹⁸ Ideally, CSAR operations should be conducted by dedicated forces; however, given the constraints on UK defence expenditure, UK CSAR will be a capability rather than a role for specific units. Moreover, US procedures, like other nations which currently have a CSAR capability, have now switched from dedicated units to a general capability practised by many different forces with responsibility for recovery of the downed

Potentially, the only specialised unit now is the Israeli Air Force Aeromedical Evacuation Unit (Unit 669) which is tasked with the rescue and recovery of personnel trapped behind enemy lines

aircrew initially falling to the force from which they came. Potentially, the only specialised unit now is the Israeli Air Force Aeromedical Evacuation Unit (Unit 669)¹⁹ which is tasked with the rescue and recovery of personnel trapped behind enemy lines. The unit is a significant force in its own right and has commandos, doctors and medical staff as well as a variety of attack and support helicopters. Accepting that most future conflicts will be expeditionary in nature,²⁰ involve coalition partners and likely to be of relatively short duration, why is there a need to provide a rescue capability in what will almost certainly be hostile territory and may result in the loss of additional assets? There are many reasons why these operations should be conducted, but the 4 principal ones are as follows:²¹

a. Governments and the military commanders have a duty of care to reduce, wherever possible, the risk to the lives of its servicemen.

b. The likely short duration of high intensity future conflicts, together with the time necessary to train personnel for operations, places greater emphasis on the rescue of highly trained assets.

c. The morale of protected units (crews) is improved.

d. The enemy are denied the use of captured personnel, including downed aircrew, as sources of intelligence and propaganda, or as human shields.

In addition to the above factors, there is an increasing emphasis on moral responsibility. Coupled with duty of care, this factor is an increasing feature of Service life as can be seen by the introduction of programmes throughout the Services such as “Investors In People”. Moreover, in a democratic society, what is the value of a human life? This point has tested the most senior civilian judges when considering the compensation to be paid on culpable death. Therefore, if it is considered immoral to place a monetary value on a person’s life, is a democratic Government, unlike a totalitarian one, obliged to make all necessary attempts to rescue downed aircrew and prisoners? Public reaction to the treatment of POWs in recent conflicts would indicate that in a democratic society, this is the case. This is particularly true as the nations that we have, or are likely to engage are the least likely to observe the various Geneva Conventions.

Thus, if we accept the need for personnel to operate beyond the forward line of troops, the need for CSAR is paramount and must be taken into account when planning for any operations. This planning may result in a requirement for additional assets to provide the necessary CSAR support or may simply highlight what resources are available to allow the Joint Commander to decide if the risk to personnel is justified given the opportunities to recover them. A fundamental principle of CSAR is that the



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in the sweep, suppression of enemy air defences (SEAD) and escort roles; ground attack aircraft to counter any surface threat; electronic counter measures, airborne refuellers and AWACS aircraft. In addition, there is a need to provide a cadre of specially trained ground personnel to provide fire support, protection and to recover the downed aircrew. On coalition operations, unlike national operations, many of the assets will already be available in theatre and the only requirement may be to provide extended range, air-to-air refuelled, helicopters.

At least 2 and preferably 3 helicopters will be required to conduct each CSAR mission. The costs of a dedicated force are high as can be seen from the table below:²²

ITEM	Cost per Item	Number per Package	Total Cost
Helicopters	£28,000,000	2	£56,000,000
Aircrew	£45,000	8	£360,000
Ground Team	£28,000	6	£178,000
TOTAL			£56,538,000

Note that the above figures exclude the maintenance and other base support necessary to keep a squadron operational.

helicopters, which are vulnerable to enemy action, must only be in hostile territory for the minimum time. Therefore, it is essential that all necessary precautions to protect helicopters are taken. A CSAR package should consist of air defence aircraft



The RAF has just acquired 8 Chinook HC Mk 3 aircraft and is awaiting delivery of the first of 22 Merlin HC Mk 3. At a cost of £26M for the Chinook and £28M for the Merlin, these represent a significant investment. They will be capable of conducting CSAR operations as they are night vision goggle capable (NVG), have air-to-air refuelling (AAR) – although the UK does not have an aircraft capable of refuelling helicopters in-flight – and a comprehensive defensive aids suite. However, the aircraft have been bought for specific tasks – the former for special forces operations behind the enemy forward line of troops and the latter for army support – and cannot be solely dedicated for CSAR operations. There are insufficient funds within the defence budget to purchase dedicated aircraft and, if there were, the utilisation of such assets in their primary role would not justify the purchase.

Historically, the UK has appeared to be reluctant to develop a CSAR capability. Some would maintain that this was purely on financial grounds; however, it could be argued that during the cold war period, there was recognition that the recovery of downed crews from within the Eastern Bloc would be too difficult and hence the requirement for the capability was not pursued. Today, in light of the perceived type of operations in the future and taking account of the requirements above, there is now a recognised operational requirement to have a CSAR capability. Therefore, should the UK attempt to “buy into” an existing CSAR capability such as the American, French or Italian capability or look to form a multi-national or NATO organisation as with the NATO AEW Force (NAEWF)? The problems with the first proposal are that no nation has a dedicated CSAR force. They are either primarily employed in standard SAR tasks or special forces operations. Consequently, it is unlikely that purchasing a specific element and not the whole package would be acceptable. Secondly, even if this option were possible, there could be difficulties over the fact that other nationalities are placing their lives in danger to rescue UK forces when the UK will not commit its own military to such a task. There are also the difficulties of a conflict of tasking, different rules of engagement (ROE) and of command and control. Additionally, it may be the case that in certain coalition operations, the UK will be prevented from participating as they cannot provide a CSAR capability. Finally, political agreement on the use of such an organisation and deployment of the forces to the same operation may not occur. Thus, the option to join an existing organisation by being a customer is not a practical solution.

The second option also has difficulties, many of which are the same as that of buying into an existing capability. To establish a NATO or a European Force would require investment from member countries, all of which are reducing their defence expenditure and unlikely to be willing to provide additional funding. Moreover, with most European Nations establishing some form of national CSAR operation,²³ the majority would not be prepared to forsake their own capability and the duplication of assets would be unacceptable. In addition, whilst a command and control system can be established quite easily using the NAEWF as an example, difficulties may still arise when not all member nations participate in an operation and it is conducted



The procurement and use of a UAV such as the Phoenix is very cheap when considered against the cost of Eurofighter

under a United Nations mandate rather than a NATO or European one. Furthermore, there would still be the requirement to ensure that tasking priority decisions made by the Joint Force Air Component Commander (JFACC) are

complied with and that national interests do not interfere in the process. Finally, the military would prefer to retain their own independent capability, albeit as a secondary role, rather than relinquish the safety and recovery of their personnel to a third party. Therefore, on political and financial grounds, this option is unlikely to progress.

If the value of the individual to the military is so great but the cost of rescue is too heavy a price to pay in today's financial climate, should nations consider the use of unmanned aerial vehicles (UAVs) to provide the information or fight the battle normally conducted by manned aircraft? The procurement and use of a UAV such as the Phoenix is very cheap when considered against the cost of Eurofighter. The UAV is portable and can be taken around the battlefield with relative ease. However, the flexibility inherent in air power²⁴ is not available with such a system. Whilst there is no doubt that the use of UAVs in certain roles such as reconnaissance provides an effective solution, to date the technology to conduct effective aerial combat using such vehicles does not exist. If the advance of technology continues to progress at the rate that it has done over the past 10 years, there is little doubt that such a capability could be available within the next decade. Indeed, the Future Offensive Attack System currently under study as a replacement for Tornado GR4 includes the option for UAV. On the other hand, the

probability of a fully operational UAV capability must be regarded as very low and the loss of flexibility in response from a manned aircraft counts against the introduction of such a system. Moreover, currently, the reliability of datalinks and the time lag inherent with the use of such systems means that it is dangerous to give combat missions entirely to UAVs. Whilst the introduction of UAVs into the offensive, defensive and tactical role would remove the need for CSAR for those operations, there would still be a requirement for CSAR for special forces (SF) personnel.

Consequently, the most cost-effective solution for the UK is that of assigning helicopters the secondary role of CSAR. However, it is essential that the secondary role is fully equipped and funded. If not, there is the risk of losing poorly equipped assets manned by highly trained aircrew. Any conflict between an SF mission or the rescue of downed aircrew would be resolved by the JFACC. Although there will be a training penalty keeping the crews proficient to conduct the basic operation, the advantage of this concept is that there will always be specialist troops available to assist in the recovery of the aircrew whether it be an SF unit or the RAF regiment personnel assigned to helicopter squadrons. Moreover, whatever operation the UK is involved in, be it bi- or multi-national, there will often be helicopter support assigned which could provide a basic CSAR. This will provide a vital morale boost for UK forces and will ensure that the UK is able to participate in any operation. Recently, to improve their ability and to provide vital training in a new role, RN Commando Sea King Helicopters have taken part in a multi-national amphibious CSAR exercise in Spain.²⁵ The Commando helicopter proved its versatility in this role as it has NVG compatible cockpit, external lighting, armoured crew seats and a full defensive aids suite. For the future, if the concept of a modular helicopter as suggested by Westland Helicopters²⁶ is taken forward, the UK will have a very flexible operating platform. This is particularly relevant for

Merlin where a basic airframe can be re-roled quite easily for specialist missions.

Should it be required, national assets could be combined into a specialist package to



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conduct CSAR. As these operations will be controlled by the JFACC, this should present no difficulties and could lead to a very effective and capable package. However, it should be noted that there would also be a training penalty with this option as it would be essential for the various forces to practise such a tasking to ensure that all the relevant procedures in STANAG 7030 were adhered to.

This paper has investigated whether the value of downed aircrew to the military machine justifies their rescue irrespective of the cost. Currently, the UK does not have the capability to conduct such operations in a hostile environment and in the present financial climate, is unlikely to afford a dedicated capability in the future. Therefore, it is necessary to balance the treatment of POWs, the cost of training and the need to keep all available aircrew flying against the cost of mounting rescue operations whether as a national, coalition or multi-national operation. Additionally, the influence of the media on public perception of operations will need to be taken into account.

The capture and retention of POWs has occurred in all major conflicts during this century but the advent of air power brought a new dimension into the situation where the time and cost to train aircrew meant that they were too valuable an asset to lose. As more complex aircraft were introduced with a resultant increase in training time and costs, the need to recover downed aircrew and return them to the front line as soon as possible became more compelling. Although the requirement was quantified, the costs of procuring and operating a dedicated rescue service for downed aircrew was harder to justify.

The advance of media technology has been significant. Media coverage during Total and Total/Limited wars tends to be in accordance with national priorities and censored through military sources. However, in lesser conflicts, the advent of real time reporting and free-lance journalists outside the control of the military or governments has posed new difficulties. Independent journalists provide accurate and strong visual footage direct to the people. Although the media see and photograph POWs, there has been nothing to suggest that the media coverage has caused maltreatment of any captives. Thus, the media have not adversely affected the treatment of POWs and may have assisted in their well being. Moreover, the introduction of female aircrew has not influenced media reporting although the first woman aircrew fatality may result in a change in this area.

Historically, the treatment of the vast majority of POWs has been in accordance with the Geneva Convention. The notable exceptions have been where one force or perhaps both opposing forces have not signed and ratified the convention or where the conditions accorded the captive force are well below that expected by the POWs. Thus, if POWs are treated correctly and there is no media pressure for a rescue, why do we need CSAR? The value of the man coupled with a moral requirement for the government to provide duty of care means that some form of rescue attempt should be made. Moreover, recovery of a downed aviator denies a source of intelligence or propaganda to the enemy and permits the timely return of aircrew to the front

line in what will generally be short duration, high intensity conflicts. The UK cannot afford a dedicated CSAR capability. The possibility of purchasing CSAR from a coalition partner is unlikely to be satisfactory and could result in severe political and military frustration over command and control, priority of tasking and conflict of national interest. The option of forming a joint or multi-national force also faces difficulties over funding, command and control, priority of tasking and national interests. Additionally, the problem of forming a force to operate in a hostile environment with different ROE is not easy to overcome. Therefore, the most sensible option is to use available UK assets for CSAR as a secondary role. The advantages to this are that no additional assets are required, the JFACC will be able to make decisions on tasking and priorities and, where appropriate, national assets in theatre can be combined into a multi-national force. Against this will be the requirement to provide training and for all potential forces to conduct regular exercises at national and, potentially, multi-national level.

In summary, in a high density, short duration conflict, the inability to easily replace downed aircrew ensures that they are a high value asset. Therefore, morally, because of “duty of care” and to maintain the morale of other aircrew, all downed crews should be rescued whenever possible to prevent them falling into enemy hands where they could then be used as a source of information or as a propaganda tool. The nature of the environment means that this will usually be a rescue conducted under hostile conditions and will therefore be a CSAR operation. The UK needs to provide its own CSAR capability and this should be achieved by use of assigned assets in a fully funded and equipped secondary role. Where necessary, these assets can operate as part of a multi-national force.

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- 3 Coursier, Henri, *Course of 5 Lessons on the Geneva Convention*, P59.
- 4 Whitcombe D, *The Rescue of BAT 21*, P134.
- 5 Ibid, P102.
- 6 The American Government measured the success or failure of operations in the Vietnam War by the count of 'body-bags'. This was soon to become a discredited system when it became obvious that it was impossible to accurately record the numbers of deaths caused by B52 bombing raids and similar actions taken by ground forces.
- 7 Allen, Charles, *Thunder and Lightning*, P116.
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RAF Tornado F3
Armed with four Skyflash air-to-air missiles and
four Sidewinder short-range air-to-air missiles



The Seductive Promise of Air Power:

Strategic Coercion in Vietnam (and beyond?)

They made a Wasteland and called it Peace
(Tacitus)

Coercive air power has been one of the key concepts and war fighting strategies of the 1990's and in an age where governments, and the United States in particular, appear less and less willing to commit ground forces, it is likely to prove of ever increasing importance. But questions remain as to how effective it really is, and over the most suitable methods to adopt. In order to explore the nature and requirements for the successful application of coercive airpower this paper will focus on the two major interdiction campaigns of the Vietnam war: Rolling Thunder and Linebacker. Whilst the conflict finished over a quarter of a century ago, an understanding of its conduct can provide useful lessons and pointers for the uncertainties of today, and into the future.

Analysing the air war over Vietnam is always a complex affair for, as David MacIsaac has argued, it is possible to identify (at least) five separate, yet often concurrently running, operations with widely varying foci, methods and duration.¹ Nevertheless, a study of Vietnam is of great interest for, amongst other reasons, the air offensives mounted against the country were the heaviest in the history of warfare. Operation Rolling Thunder alone saw the delivery of more than eight times as much tonnage as was dropped by all the allied air forces in all the theatres of the Second World War. This enormous concentration of firepower resulted in the deaths of over 100,000 civilians and 8,000 aircrew.²

The 1972 Linebacker offensives, though considerably shorter in duration, saw an increase in the intensity of destruction. And yet the US, indisputably the most powerful nation on earth, still lost the war. Coercive air power had failed. An analysis of the two campaigns therefore also serves as a useful reminder that technological superiority is not enough to win a war. Again, in the age of stand-off attack and billion dollar weapon platforms, this is a lesson worth reiterating.

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In this paper, therefore, the two campaigns will be compared and contrasted: their aims, their methods, and their results. In order to achieve this the conceptual framework underpinning the application of coercive air power will be examined, as will its practical application and limitations.

AIR OPERATIONS: AIMS

Operation Rolling Thunder commenced on March 2nd 1965 and lasted until October 31st 1968. The overall aim of the campaign was to force the Northern regime, led by Ho Chi Minh, to stop its support for the communist uprising in the South, and this was to be achieved by a two-fold strategy: the destruction of the political resolve of Hanoi in the face of ever increasing costs and American firepower; and the simultaneous interdiction of the supply routes to the South. Thus, according to Secretary of Defence Robert McNamara, the goal was to pressure the North into negotiating ‘...explicitly or otherwise...’ and to ‘...reduce the flow of men and supplies from North to South.’³ A further, subsidiary, hope was that this display of American commitment and technological superiority would help to bolster the flagging morale of the South Vietnamese military and political elites. Thus, from the very beginning, the campaign was beset by a lack of unity or clarity over aims, a conflation of the military with the political, the grand strategic with the operational.

The resumption of air operations over the North during 1971-2 can be subdivided into two primary operations: Linebacker 1 (May 10 - October 23 1972) and Linebacker 2 (December 18 - 29 1972). Once again, the overall aim

Whereas in 1965 the US was in a confident position and facing what it considered to be a containable guerrilla threat to the Southern regime, by 1972 it was hastily withdrawing its demoralised ground forces from what had escalated into an essentially conventional war



was to halt the North's support of the southern insurgency, but by then the circumstances of the war had changed significantly. Whereas in 1965 the US was in a confident position and facing what it considered to be a containable guerrilla threat to the Southern regime, by 1972 it was hastily withdrawing its demoralised ground forces from what had escalated into an essentially conventional war. Saigon was forced to rely, in the main, on the abilities of the US equipped Army of the Republic of Vietnam (ARVN), backed by massive American air support.

Linebacker 1 was launched as a response to the North Vietnamese Army's (NVA) powerful – and potentially war-winning – Easter offensive. The US was determined that this assault should fail and that the North be forced onto the negotiating table; they wanted to be perceived as withdrawing from the war with honour.⁴ Linebacker 2 was a further extension of this goal as it was ordered to force the North back into serious negotiation following months of stalling and diplomatic stubbornness.

AIR OPERATIONS: RESULTS

Rolling Thunder was a total failure, indeed it should '...go down in history as the most ambitious, wasteful and ineffective [air] campaign ever mounted.'⁵ None of the original aims were met: infiltration increased throughout the long years of the campaign, whilst the political will of Hanoi remained unwavering in its commitment to support the Southern insurrection. Furthermore, US casualties, in the face of an increasingly sophisticated air defence network, were very heavy, both in terms of equipment and manpower. It can therefore be argued that the campaign proved counter-productive, that the net gain in a cost benefit analysis was less than zero: Hanoi emerged as the real victor. The US was seen to be deploying massively disproportionate force against a Third World enemy, giving the impression of a neo-imperial bully in the



Few people can identify with well-fed representatives of a rich society journeying ten thousand miles to pilot multi-million dollar B-52's dropping death and destruction on underfed Indochinese

eyes of the world. Indeed Ramsay Clark has noted: 'Few people can identify with well-fed representatives of a rich society journeying ten thousand miles to pilot multi-million dollar B-52's dropping death and destruction on underfed Indochinese.'⁶

The Linebacker operations, on the other hand, were a qualified success, in that they met their more limited goals. The impressive early advances of the NVA Easter offensive were neutralised by early July, and it soon became apparent to the Northern political leadership that a military victory was not imminent, and maybe even impossible.⁷ Realising that the only chance of making progress lay thousands of miles away, in the calm negotiating rooms of Paris, they switched their attention to formulating a political settlement knowing that with the US steadily withdrawing its forces, it was only a matter of time before they could resume their conquest.⁸ By October 21/22 Henry Kissinger (US National Security Advisor and chief negotiator) and Le Duc Tho (the North Vietnamese negotiator) were on the verge of signing an agreement. However, the South, under President Thieu was soon stalling.⁹

Thieu, not surprisingly, was unhappy that the provisional agreement failed to force Hanoi to withdraw its forces from the South, and he demanded that 69 amendments be made to the document.¹⁰ This, and the ensuing political cold-feet in Washington, effectively killed the agreement and set the stage for the later resumption of bombing. Negotiations dragged on but the North returned to its earlier position, whilst the Americans could see no satisfactory way of placating Thieu. The Americans therefore had to compel the North Vietnamese to change their diplomatic position, to employ coercive violence in order to secure a political objective. Their primary tool was the Christmas Linebacker II offensive. For 11 days the Americans initiated a high intensity bombardment against key Northern targets and on December 29 Hanoi signalled its willingness to compromise, and from then on they proved more willing to give the Americans diplomatic leeway.¹¹ The Paris Accords were signed in January 1973; the US was free of its massively damaging commitments at long last. Thus, in as far as the latter offensive forced the North to alter its behaviour in relation to its favoured course of action, Linebacker 1&2 can be judged a success.

In summary, therefore, it can be seen that the overly ambitious Rolling Thunder failed abysmally whereas the 1972 offensive(s) succeeded, at least in terms of its more modest objectives. In order to account for the massive difference in outcomes it is first necessary to (briefly) examine the conceptual framework underlying the application of strategic airpower, and then to examine the conditions that were present in the Vietnam conflict: to match theory with practice.

AIR POWER THEORY: A VERY BRIEF HISTORY

The central motive underlying the use of strategic air power is to force the enemy to change their behaviour by manipulating costs and benefits. This is achieved by targeting a country in such a manner that it is forced to act in a way that it would otherwise prefer not to; such as withdrawing forces, negotiating, or even surrender.

One of the fathers of airpower theory is Giulio Douhet, whose inter-war writings are full of confidence in the potential for military forces operating in 'the third dimension' to become the dominant factor in the conduct and outcome of future war. His is a pure strategic theory, in that it focuses on the belief that the infliction of high civilian casualties and infrastructural damage will shatter civilian morale and therefore undermine the will and the ability of a government to continue to fight.¹² Douhet was not concerned with defeating the enemy on the battlefield, in the belief that this was unnecessary, a redundant method condemned to the pages of history.

For 11 days the Americans initiated a high intensity bombardment against key Northern targets and on December 29 Hanoi signalled its willingness to compromise...



Due to the powerful memory of stalemate and the atrocious casualties that had characterised the Western Front, this idea gained widespread attention during the inter-war period, and it was utilised by both the Germans and the Allies during the Second World War, as demonstrated by the massive area bombardment of cities spanning the continent and in Japan. However, it proved to be deeply flawed, mainly due to the fact that ‘...the more bombs dropped the lower the morale – but not necessarily a significant lowering of the will to resist.’¹³

The simplistic, and horrifyingly brutal, Douhetian strategy was thus shown to be inferior to the hybrid strategic-tactical integration model proposed by Mitchell, and vindicated on the battlefields of Europe. As Bernard Brodie has argued this combination of attacks on military units and their supply columns and material resources led to far greater success than flattening cities, a method which was ‘... never completely convincing to uncommitted observers. Against Germany the [area-bombing raids] came too late to have a clearly decisive effect; against Japan they were imposed on an enemy already prostrated by other forms of war.’¹⁴ The direct degradation of the enemy’s front-line combat capability combined with the restriction and eventual destruction of the military infrastructure – command and control facilities, fuel and ammunition supplies etc. – had a more decisive effect on the outcome of the war than the levelling of cities.

Nevertheless the Second World War demonstrated that the extravagant claims of the earlier pioneers and air-power prophets were hopelessly optimistic: war could not (yet?) be won by conventional airpower alone; ground forces would always be needed to secure territory and maintain the initiative; and civilian and political determination was not so easily undermined. Air power reached its maturity during the bitter years of the Second World War, but these hard won learned lessons were often later forgotten (or ignored), and Vietnam – in the early stages, at least – serves as a paradigmatic case of historical amnesia. As Asprey has charged: ‘In the momentous months of 1964 and 1965 Johnson and his advisors displayed massive historical ignorance of airpower.’¹⁵

Following the Second World war, and from under the enveloping shadow of atomic weapons, new theories and strategies emerged. However, post-war strategic thinking has been dominated by a concentration of nuclear issues, particularly acute in the two decades following the war, and this led to conventional warfare being overshadowed, or at best subsumed within more general nuclear-strategic frameworks. The 1950’s and 60’s saw a massive growth in the number of ‘defence intellectuals’ who applied the latest academic models to strategy. Theorising about air warfare became ‘...almost an industry unto itself, one heavily populated with game theorists, structurally orientated behavioural scientists, economists, and other social scientists – many of whom seem[ed] addicted to a jargon that may be subconsciously aimed at making the unthinkable appear rational.’¹⁶ These theorists tended to concentrate on deterrence and the possibilities of preventing, limiting, or even winning nuclear wars – again leaving thinking about conventional, let alone unconventional, warfare a distant priority.



...the Second World War demonstrated that the extravagant claims of the earlier pioneers and air-power prophets were hopelessly optimistic: war could not (yet?) be won by conventional airpower alone...

The most important of these theories was developed by Thomas Schelling and, like the work of the original prophets of air power, it focused on the perceived vulnerability of civilian populations. Instead of the concentrated application of force in an all out initial effort, Schelling introduced the idea of 'gradual escalation', and of anticipated violence as a coercive tool: 'To be coercive violence must be anticipated.'¹⁷ The idea of calibration, of control and finesse in the application of force, meshed well with many in the defence establishment and with the systems-obsessed Secretary of Defence McNamara in particular. This was to have important consequences in Vietnam, where the tempo and pattern of Rolling Thunder was based on Schelling's insights.



**US Secretary of Defence
Robert McNamara**

A further model, identified by Robert Pape (but earlier highlighted by Brodie) as the 'Interdiction Model', argues for the enforcement of political will through the targeting of the enemy's *military* infrastructure.¹⁸ This idea again emerged from the Second World War, where it was shown to be highly effective, although as noted it was employed in conjunction with other, less useful, strategies. The central idea is to make it impossible for an enemy to achieve their political goals through the application of force.¹⁹ It is therefore not the targeting of civilians, in either the moral or economic sphere, nor is it the targeting of a nation's industrial infrastructure that achieves success; rather it is the removal of the ability to conduct operations of the type necessary to achieve victory on the battlefield – it is the neutralisation of the means of violence. This may appear to some observers as being an obvious ploy, but this does not alter the fact that it has rarely been successfully achieved, or even attempted, during a century of major wars.

This summary is by no means intended as an exhaustive survey of competing ideas about aerial coercion; rather it highlights the fact that the conceptual framework underlying the implementation of strategic bombing for the purpose of political coercion has rarely, if ever, been characterised by a coherent

...theorists tended to concentrate on deterrence and the possibilities of preventing, limiting, or even winning nuclear wars – again leaving thinking about conventional, let alone unconventional, warfare a distant priority

operational focus. Different strategies, based on different conceptions of means and ends, have rarely been concisely delineated. This intellectual failing was to have major implications in the air war against North Vietnam, where US planners failed to heed the lessons of recent history, and further confused matters by trying to implement all of the aforementioned strategies simultaneously, though in often diluted form. Again, this is a lesson that the air planners of today and tomorrow ignore at their peril.

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VIETNAM: A SUITABLE TARGET FOR COERCIVE AIR POWER?

Vietnam was not the sort of state, nor the type of war, that the theorists had in mind when they originally developed their models of coercion in the air-conditioned offices of the RAND corporation and the Pentagon. They planned for an assault on a Western style, highly industrialised state, with an easily identified and vulnerable economic infrastructure – namely the Soviet Union and its satellites in Eastern Europe. Vietnam, however, had an agrarian economy where industrial output accounted for a meagre 12% of GNP.²⁰ Therefore heavy industry was not a critically important asset, and furthermore when it was neutralised the loss was more than made up for by supplies sent from both China and the Soviet Union. Indeed, the US appeared to ‘...ignore the fact that North Vietnam...was essentially a conduit through which Soviet and Chinese material passed on its way to the South.’²¹

Ho Chi Minh and his people had been at war for nearly thirty years and the gradual escalation of military force directed against their country was not going to destroy morale overnight. Furthermore, the US failed to take into account the strength and resolve of the Vietnamese people, or their ability to absorb punishment; this resolve being a combination of traditional Vietnamese nationalism and strong political indoctrination.





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method for winning the war. The costs to the North of attacking its industrial infrastructure were minimal, whilst for political (and moral) reasons her cities were not targeted. This left the critical target opportunities, outlined by Pape, as central to the success of coercive airpower operations – the vulnerability of the military infrastructure. This vulnerability increased significantly as the war progressed, as the North moved from supporting an insurgency to fighting a conventional war, and it is here that the reasons why Rolling Thunder failed and why Linebackers 1&2 resulted in success, can be found. It is here also that the limits of aerial coercion can be discerned.

The failures in intelligence and political imagination were compounded by the fact that the US was fighting a limited war and that therefore the full might of its military could not, for socio-political reasons, be brought to bear. As Richard Crockatt has observed ‘...defeating communism was never a live option if that meant risking all-out war with China and full American mobilisation on to a war footing.’²² Thus even at the height of Linebacker 2, the most intense of the offensives, there was still (luckily) no systematic area bombing of the major northern cities. The US was therefore trying to implement thoroughly unsuitable (and irrelevant) strategies in a watered down form.

A further problem that faced the US military was the inappropriate nature of much of its military material. If coercive air power was to be successfully employed in such a demanding environment then the very best, most suitable, weapons platforms and systems would be required – if any existed at all. But this was not the case. As David MacIsaac has argued, the US Air Force, following the war in Korea, concentrated its funding on Strategic Air Command (SAC) and its assumed role as the force of nuclear deterrence and the ‘air-atomic mission’, at the expense of the rapidly deteriorating Tactical Air Command (TAC) and other conventional systems.²³ Thus not only was Vietnam an inappropriate target, but the US was not suitably equipped to fight the war. This material paucity is best demonstrated by the regular shortages of munitions, which saw aircraft embarking on dangerous sorties carrying only one or two bombs.

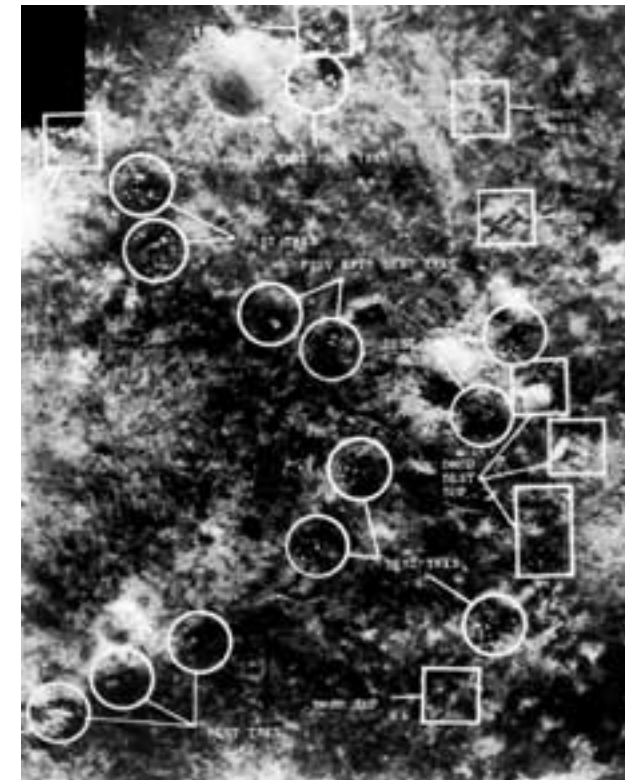
And yet interdiction was still regarded as the key, the only potential

AIR OPERATIONS: ROLLING THUNDER (WAYS AND MEANS)

With the benefit of hindsight it can be seen that Rolling Thunder was doomed to failure before it started. It was an attempt to superimpose a conventional, though politically limited, strategy onto a highly unconventional war. Following from the primitive computer models of the defence intellectuals the campaign was ‘...intended to be the most carefully calibrated military operation in recent history.’²⁴ Throughout the three year period that the campaign ran, the conflict in the South was predominantly a guerrilla war fought by indigenous Southern units with a limited amount of Northern support. However, the US high command appeared to be under the impression that the communist forces relied almost totally on the North for support, and that if they could interdict the supplies then the insurgency would be crippled. If this level of dependency existed, and if the interdiction could be achieved in practice, then in theory Rolling Thunder should have been a success. However, both assumptions were catastrophically inaccurate.

A study conducted on behalf of the Joint Chiefs of Staff (JCS) in mid-1965 estimated that the whole Viet Cong (VC) force deployed throughout the South (the equivalent of 125 battalions) in addition to the one suspected NVA Division (the 25th) in the zone of operations, required a total of 14 tonnes of supplies per day.²⁵ As the Soviets and Chinese were pouring an estimated 6000 tonnes per day into the North, only a fraction needed to get through.²⁶ The numbers did not compute but the Americans, lacking any superior strategy, safe in their incorrect assumptions about the nature of the war and confident in their military doctrine and technology, continued this impossible endeavour for three bloody years. As President Lyndon Johnson once remarked to an advisor ‘the generals only know two words – bomb and spend.’²⁷ However, as Vincent Cable has noted ‘It could have been concluded in the first month of the new air campaign that...Rolling Thunder had impaired neither the will nor the ability of the North to prepare for and engage in effective military action.’²⁸ It was a pointless, wasteful exercise.

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**USAF destruction of
HO Chi Minh Trail**

The so-called Ho Chi Minh 'trail' was in fact a complicated system of interlocking and expertly disguised tracks, some only a matter of feet wide...

These problems were compounded by the nature of the supply route that was the main target of the interdiction. The so-called Ho Chi Minh 'trail' was in fact a complicated system of interlocking and expertly disguised tracks, some only a matter of feet wide, others the size of highways. The total length of these routes was in excess of 13,000km and, in addition, the South had over 1,000 miles of exposed coastline around which 50,000 sampans conducted their trade.²⁹ It was this massive, ungainly arterial system that the US invested billions of dollars trying to cut, in a futile attempt to halt the flow of a few tons of supplies per day.

Furthermore, there were serious operational difficulties, with the campaign beset by a '...debilitating disunity of effort in the direction and use of air power.'³⁰ Inter-service rivalry, a convoluted chain of command, politically motivated (even chosen) targeting policy and poor tactics all combined to further weaken the campaign. However, even if all had been running smoothly the eventual outcome would have been the same: abject failure.

Despite the massive scale of Rolling Thunder, and the impressive display of firepower and technology, the Americans had '...difficulty in understanding that technologically advanced weaponry and vastly superior firepower will not always be sufficient to produce victory.'³¹ The US in juxtaposing the methods and ideas of a 'techno-industrial' paradigm of war at which they excel with the guerrilla insurgency that characterised the early stages of the conflict, condemned themselves to humiliation in the eyes of the world. The guerrillas could not be interdicted militarily, and the US was doomed to fail in its massive endeavour.

AIR OPERATIONS: LINEBACKER 1&2 (WAYS AND MEANS)

Linebacker succeeded where Rolling Thunder failed because by 1972 the nature of the war had changed; no longer was the North supporting a guerrilla insurgency, rather it was fighting a conventional war. For its Easter offensive the NVA committed 14 Divisions and 26 Regiments fully equipped with tanks, heavy artillery, APCs and all the associated paraphernalia of a modern mechanised army.³² This formidable force destroyed most of the early ARVN resistance, and it appeared that it could sweep ever further South. At first the Americans responded with what Pape terms a 'Ceremonious Schelling' strategy³³ – Operation Freedom Train – whereby massive US air reinforcements were sent to the region and an easily recognisable pattern of gradual escalation, familiar from Rolling Thunder, was initiated. When it became apparent that this was having little effect the US switched to a concentrated effort to interdict the lines of communication, to exploit the increased *military* vulnerability. Linebacker 1 ensued.

A conventional army measures its supply requirements in the thousands of tonnes per day and it was this material that Linebacker targeted. As President Nixon explained ‘the goal was to compel Hanoi to cease its conventional offensive through the destruction of North Vietnam’s war assets and delivery system.’³⁴ Thus an almost exclusively military orientated targeting policy was adopted, and it proved very successful. By June the North’s offensive had stalled and they were compelled to negotiate.³⁵

...President Nixon explained ‘the goal was to compel Hanoi to cease its conventional offensive through the destruction of North Vietnam’s war assets and delivery system

Linebacker 2 followed a similar pattern, with much repeat targeting and it forced the North back onto the table. In general the operation was directed at bombing those targets north of the 20th parallel that had not been bombed since October 23.³⁶ There is much dispute over Linebacker 2, with some commentators arguing that it was unnecessary³⁷ whilst others claim that it, solely, was responsible for the peace accords. Both of these cases have been overstated; the operation should be judged in the context of the overall interdiction effort in 1972. It was successful in itself, but without the background work of Linebacker 1 it would have been insufficient. However, the success of the Linebacker offensives should not be overplayed. They were far more limited in their aims, and should be understood in this context; indeed they can be seen as a mere saving exercise by the Nixon administration, as a final fling to leave the impression of withdrawing with honour.

ENDNOTE

In a retrospective analysis of the War – chillingly reminiscent of the ‘stab in the back myth’ propagated by German Right in the aftermath of WW1 – Richard Nixon claimed that ‘...in the end, Vietnam was lost on the political front in the United States, not on the battlefield in Southeast Asia.’³⁸ This is quite simply a mistake – the very nature of the war dictated the likely success of the American response; Vietnam was lost because the Americans were ill-prepared for the type of war in which they found themselves, and ill-equipped to fight it once engaged.

Traditional models of coercive air power have proved inadequate when it comes to forcing an enemy to change their political goals. The targeting of civilians achieves little apart from unnecessary suffering, and can be counter-productive if it leads to a shift in other states’ diplomatic or material support. Furthermore, targeting the industrial-economic infrastructure is also problematic as was displayed in the Second World War (and again in Kosovo?), whilst against an agrarian economy it is of negligible impact.



As argued, the most efficient method of coercive airpower is to target the military vulnerability of the enemy, and yet in Vietnam it was only with the transformation of the ground war from a guerrilla interdiction to a conventional conflict that the US could begin to exploit this vulnerability. But by that stage it was too late to affect the overall outcome of the war, and all that could be salvaged was a perception of withdrawal on America's own terms.

It is ironic that if the North had not been so successful in the ground war, allowing it to climb the ladder of escalation (and hence commitment of resources), it would not have been as vulnerable to air power as it was in 1972. This leads to the conclusion that it is simply not enough to hold total air superiority – for airborne coercion to be successful it is also necessary to hold the initiative on the ground, for without this the enemy can calibrate their flow of personnel and material, and in doing so raise or lower their level of military vulnerability. A guerrilla war cannot be combated purely from the air, a lesson that is as relevant today as it was a quarter of a century ago.

The US tried to impose its conventional and unwieldy war fighting doctrine (ideology?) in an unconventional conflict, to make the war fit the strategy rather than the other way round, and the result was the disastrous Rolling Thunder campaign. Furthermore, a study of the campaigns, and the war in general, highlights confusion over aims as well as methods, and a failure to adequately delineate the political from the military. Viewing the recent operations over Iraq, the Former Yugoslavia and Kosovo, can it be truly be said that the politicians and air-planners of the late 1990's have learnt from the costly mistakes of a quarter of a century ago?

NOTES

- 1 David MacIsaac, 'Voices from the Central Blue: the Airpower Theorists' in Peter Paret (ed), *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*, (Princeton, N.J: Princeton University Press, 1986). MacIsaac differentiates between: the war over the South; the war over the North; the war over Cambodia; the war over Laos; and the war along the Ho Chi Minh Trail. p.645.
- 2 Michael Maclear, *Vietnam: the Ten Thousand Day War*, (London: Mandarin, 1981), P.232.
- 3 Robert McNamara quoted in Vincent Cable, 'The Air War in Vietnam 1964-69' in D. E. Showalter, *An American Dilemma*, (New York, 1993) p.124. For a revealing profile of McNamara and his attitude to strategy and the war see Paul Hendrikson, *The Living and the Dead: Robert McNamara and Five Lives of a Lost War*, (London: Papermac, 1996).
- 4 On the desire for peace with honour see, for example, Robert D. Schluzinger, *U.S. Diplomacy Since 1900*, 4th ed., (Oxford: Oxford University Press, 1998), pp. 291-296, 301-304 & 309-312.
- 5 CIA analyst Raphael Iungerich quoted in Robert F. Dorr, *Air War Hanoi*, (London: Blandford Press, 1988), p.115.
- 6 Quoted in R. Asprey, *War in the Shadows*, (London: Little, Brown & Company, 1994), p.937.
- 7 Asprey, *War in the Shadows*, p.1038.
- 8 Furthermore the US was continually watering down its negotiating position and demands in order to make it easier for the stubborn North Vietnamese to agree.
- 9 See Schluzinger, *U.S. Diplomacy Since 1900*, 4th ed. pp. 301-304.
- 10 Robert Pape, 'Coercive Air Power in the Vietnam War', *International Security*, 15:2, Fall 1990. p 139. For a comparative study of the Second

- World War and Vietnam, see Robert Pape *Coercive Air Power* (University of Chicago, 1988).
- 11 Pape, 'Coercive Air Power' p.139.
 - 12 Giulio Douhet, *The Command of the Air*, trans. Dino Ferrari, (New York: Coward-McCann, 1942). The apparent success of air operations in the Second Gulf War (1990-91) led a few commentators, notably Eliot Cohen and Edward Luttwak, to claim that the original prophets of airpower, Douhet foremost amongst them, had been proven correct. For a convincing refutation of this naïve view see Claudio G. Segré 'Giulio Douhet: Strategist, Theorist, Prophet?', *Journal of Strategic Studies*, Vol.15, no.3 (Sept. 1992).
 - 13 Asprey, *War in the Shadows*, p.93.
 - 14 Bernard Brodie, quoted in David MacIsaac, 'The Evolution of Air Power since 1945: The American Experience', in R. A. Mason (ed.) *War in the Third Dimension: Essays in Contemporary Airpower* (London: Brassey's, 1986), p.12.
 - 15 Asprey, *War in the Shadows*, p.935.
 - 16 David MacIsaac, 'Voices from the Central Blue: the Airpower Theorists' p.639. For an excellent overall introduction to the myriad theories/theorists see Lawrence Freedman, *The Evolution of Nuclear Strategy*, (London: MacMillan, 1981).
 - 17 Thomas Schelling, 'The Diplomacy of Violence' in G. Chaliand, *The Art of War in World History* (University of California Press, 1994) p.1016.
 - 18 Pape, 'Coercive Air Power' p.111.
 - 19 Pape, 'Coercive Air Power' p.104.
 - 20 Pape, 'Coercive Air Power' p.125.
 - 21 Stanley Karnow, *Vietnam: A History* (London, Pimlico, 1994) p.471.
 - 22 Richard Crockatt, *The Fifty Years War: The US and the Soviet Union in World Politics, 1941-1991*, (London: Routledge, 1995), p.239.
 - 23 For more detail see MacIsaac, 'Voices from the Central Blue: the Airpower Theorists' p.643.
 - 24 John Lewis Gaddis, *Strategies of Containment: A Critical Appraisal of Postwar American National Security Policy*, (New York: Oxford University Press, 1982).
 - 25 Quoted in Cable, 'The Air War in Vietnam, 1964-69' p.126.
 - 26 Karnow, *Vietnam: A History*, p.469. Karnow estimates that a total of 600 t/day were reaching the forces in the South.
 - 27 Johnson quoted in Schluzinger, *U.S. Diplomacy Since 1900*, 4th ed. p.276.
 - 28 Cable, 'The Air War in Vietnam, 1964-69' p.120. One of the greatest tragedies of the period was that Robert McNamara soon began to develop serious doubts about any chance of victory, and yet he remained in office whilst overseeing a hugely costly campaign. In addition, once he had returned to civilian life he still refused to voice his concerns, and the war rolled on. See Robert S. McNamara, *In Retrospect: The Tragedy and Lessons of Vietnam* (New York: Times Books, 1995) for an attempt at explanation.
 - 29 Figures from Cable, 'The Air War in Vietnam, 1964-69' p.126.
 - 30 Philip B. Davidson, *Vietnam at War: The History, 1946-1975* (London: Sidgwick & Jackson, 1988) p.55.
 - 31 MacIsaac, 'The Evolution of Air Power since 1945: The American Experience' p.31.
 - 32 Pape, 'Coercive Air Power' p.132.
 - 33 Pape, 'Coercive Air Power' p.133.
 - 34 Pape, 'Coercive Air Power' p.134.
 - 35 The military targets included military logistic centres, POL depots, transport arteries, bridges and rail lines. In addition the Harbour at Haiphong was mined. This concentration reduced the North's import capacity by 80%. The U.S was also deploying increasingly sophisticated weapon systems by this stage, notably Precision Guided Munitions (PGM) which allowed for much more accurate and destructive targeting. Furthermore the tactical use of B-52's (i.e at An Loc) proved devastating for the NVA.
 - 36 Pape, 'Coercive Air Power' p.138.
 - 37 Gabriel Kolko, *Anatomy of a War: Vietnam, the United States, and the Modern Historical Experience* (New York: Pantheon, 1986), p.450.
 - 38 Richard Nixon, *No More Vietnams*, (London W.H. Allen, 1986), p.15.



Myths of the Gulf War



Some 'Lessons' Not to Learn

THE EUPHORIA HAS DIED down over our “triumph without victory”¹ in the Gulf War, but the harm it can do is still with us. It is time to examine what we think we saw and learned from both the television imagery and the postwar interpretations. We need to assess with a more dispassionate eye what did and did not take place. Much – indeed, perhaps most – of what the public knows to be true about the Gulf War simply is not so. This article examines a number of assertions about the war and disputes the conventional wisdom on the subject.

What follows is a list of propositions about the Gulf War that are commonly accepted as true by the American public in general and by many policy makers and members of the military as well. They are at best half-truths, if not outright myths. One can quibble with all of them, but they constitute the conventional wisdom on the Gulf War. It is important that we assess these propositions carefully. If not, we shall take the wrong “lessons learned” from the experience. Doing so will mean mismanagement of increasingly scarce defense resources and the development of an inappropriate strategy with which to confront the future. We can ill afford either.

When the US military is called upon again, as it will be, the public is the enabling agent for its employment. Our image of defense of the nation and our vision of our security will provide the context for that decision. A public beguiled by myths of the Gulf War and false expectations about our capabilities and future success is dangerous. When policy reach exceeds practical grasp, disaster often results. Hence, this article ultimately is an effort to diminish the oft-unfounded confidence in US capabilities as a result of the Gulf War.



...young American males were safer in the war zone than in peacetime conditions in the United States. That doesn't seem like what we think of when we think of war, does it?

It Was a War

Magnificent, But Was It War?

**Angelo Codevilla, *Commentary*,
April 1992**

The Gulf War matches our conventional image of warfare, but it was an anomaly nonetheless. It looked like a war to the American public and the world at large, given the extensive television coverage provided by Cable News Network (CNN). It was a war by definition, but it was a very odd one. It also had remarkably few casualties for the ordnance expended. The 146 combat deaths suffered by the United States (346 total from all causes) out of 511,000 troops deployed from 6 August 1990 to 12 February 1991 represent a loss rate one-tenth of what the Israelis suffered in the Six-Day War of 1967. In fact, the number of deaths was so low that young American males were safer in the war zone than in peacetime conditions in the United States.² That doesn't seem like what we think of when we think of war, does it?

It was not a war in a classic sense. For most of the "war," only one side fought. For most of the 43 days of the air campaign and the one hundred hours of the ground campaign, with few exceptions, the Iraqi military didn't



In many ways, we won a battle – the battle of Kuwait – and not a war. We achieved a truce, not a peace

fight. Iraq's planes stayed on the ground or fled to Iran, and most of its naval forces eschewed combat. There were few pitched battles – the Battle of Khafji being the major exception, but even that was a limited encounter by most standards. The famous “left hook” envelopment meant that we largely avoided contact with the enemy, and vast numbers of Iraqi troops fled north to Basra or surrendered rather than fight. In many ways, we won a battle – the battle of Kuwait – and not a war. We achieved a truce, not a peace.

When you are winning a war, almost everything can be claimed to be right and wise.

Winston Churchill

It didn't end the way most wars we have fought in this century have ended. We didn't occupy enemy territory, democratize the political system, administer the country, or invest in its infrastructure after defeating it, as we did with Germany and Japan. We didn't leave tens of thousands of ground troops in the area to insure that it doesn't happen again, as we did after World War II and Korea. Nor did we totally leave the country, as we did after Vietnam. For all the one-sidedness of the military triumph, victory has proven to be elusive, with the central issue – Iraqi claims on Kuwait – unresolved. The circumstances after the Gulf “War” in many ways are not terribly different from their antecedents. Save for the destruction of many targets, what did we accomplish? Is there a better peace after the war than existed before it?

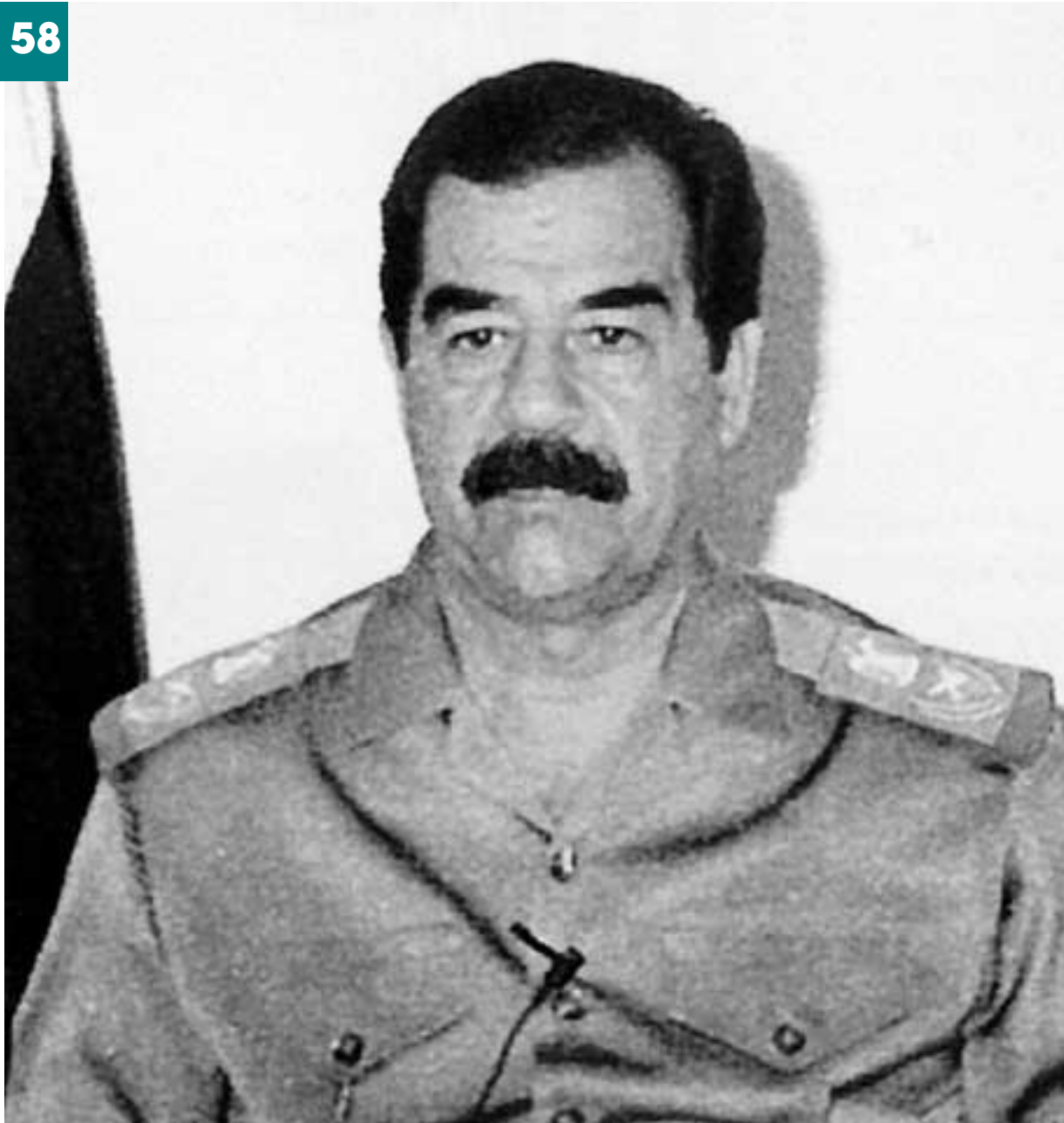
It's Over

Battle Stations

Newsweek Article on US Deployments to the Gulf, 16 February 1998

The war is not over. Its impact lingers on in many ways, and the region may be no more secure than it was eight years ago. The US Navy had six ships on station in the Persian Gulf region in July 1990. In the spring of 1998, it had 15 deployed to the area. The US Air Force had two composite wings – one at Dhahran, Saudi Arabia, and one in Incirlik, Turkey – with roughly two hundred planes. It had none in the area in July 1990. As a result of the most recent incident of





Iraq did not win militarily, but it did not lose politically. It still has claims on Kuwait as its 19th province. Saddam Hussein is still in power. On his scorecard, he “won” by not losing politically

Saddam’s jerking our chain, more than 44,000 service members deployed to the region in the spring of 1998. Even after reducing the force by more than half, we intend to leave approximately 19,000 troops in the area.³ Meanwhile, US planes patrol the skies, implementing no-fly zones in Operation Provide Comfort – now Northern Watch – in northern Iraq and in Southern Watch in the south. Each of these flights merely bores holes through the sky. The pilots do not practice air-to-air combat, close air support, or bombing skills. They just put hours on engines and airframes that further deteriorate in the desert heat and sand. Both our skills and our equipment – Guard and Reserve as well as active duty – are being seriously degraded in these operations.

The Iraqis were not beaten as badly as we thought. The two hundred thousand Iraqi casualties turned out to be more on the order of a fifth of that number, perhaps as low as eight thousand killed.⁴ Most members of the vaunted Republican Guard – with over half of the best armor in the Iraqi army and 70 percent of Iraq’s troop strength, according to analysis by the Central Intelligence Agency and the Defense Intelligence Agency – escaped north to Basra and were neither killed nor captured. Ammunition stocks were not seriously depleted in most ground units because little fighting occurred. Many items, save combat aircraft, destroyed in the war have been replaced over the years. Events since the war have shown that our knowledge of both the nuclear and chemical/biological weapons capability of Iraq proved woefully inadequate. Although these weapons remain under United Nations (UN) monitoring, they are far more extensive than we originally believed and have neither been destroyed nor decommissioned in their entirety.

Iraq did not win militarily, but it did not lose politically. It still has claims on Kuwait as its 19th province. Saddam Hussein is still in



power. On his scorecard, he “won” by not losing politically. He survived and has less domestic opposition now than before August 1990. We have deployed large forces to the region three times since the end of the Gulf War. As for those people who thought sanctions would work – Colin Powell chief among them – nearly eight years have passed since they were established. With sanctions and the Gulf War itself, not much has happened to change Iraqi policies or the regime of Saddam, save to make him even more paranoid. The population, not the government, has felt the impact. Meanwhile, our support in the region has waned considerably compared to 1990.

We Won

Saddam defined victory as “defending ourselves until the other side gives up.”

Gen Perry Smith, USAF, Retired, *How CNN Fought the War*

We did not win politically or militarily, for we did not accomplish our objectives on either front. Saddam remains in power, and his vaunted Republican Guard was not destroyed. The casualty estimates, our success in destroying Iraq’s nuclear capability, and the time it would take Iraq to reconstitute its forces were all woefully miscalculated. We forced Iraq to withdraw from Kuwait and did so with very few casualties – even fewer than in the Spanish-American War. But all was not good, for 35 of the 146 US casualties were attributed to the oxymoronic term *friendly fire*.

We did not “play” it the way Americans have come to expect wars to be fought. It neither ended nor started in the ways we have come to think about war. US forces were not engaged for five and one-half months after the aggression occurred. The rhetoric proved far more heated than the actions for most of the period of confrontation. President George Bush likened Saddam to Hitler. When the war started, we decided when to pull the trigger, not the enemy. When the war ended, the Iraqis didn’t sue for peace; we just stopped it unilaterally and then had them agree to our terms. We didn’t seek unconditional surrender, confirmed by occupying the enemy’s country. We did not insist on reparations or complete prisoner-of-war exchanges. There were no war-crimes trials. There was no comprehensive settlement. Things just sort of stopped after the magic one-hundred-hour ground campaign. Gordon Brown – Gen Norman Schwarzkopf’s chief foreign-policy advisor at US Central Command (CENTCOM), on loan from the State Department – told interviewers, “We never did have a plan to terminate the war.”⁵

Although we scored lopsided military successes, we didn’t win in many ways. We reclaimed Kuwait, but Saddam remains. We did not change the leadership or the preferences of the regime that caused the war in the first place. And the degree of



For all the destruction visited on Iraq, it is questionable if Saddam is any more deterred by our “triumph without victory”...

punishment that we thought we meted out proved in retrospect far less than we had imagined. For all the destruction visited on Iraq, it is questionable if Saddam is any more deterred by our “triumph without victory” or if the balance of forces in the area has been fundamentally transformed in our favor. We are the ones who have seen our military forces cut by roughly 40 percent. Saddam’s are building up, not diminishing. UN inspections notwithstanding, we cannot be sure of his capability to have or utilize weapons of mass destruction.



We Accomplished Our Objectives

Our military objectives are met.

George Bush, 27 February 1991

They were not. Nor were our political objectives realized. This was in large measure because we terminated the war unilaterally – earlier than we should have – without realizing the more important of our political goals and military objectives. We failed to meet our own criteria and were confused as to the larger purposes of the struggle we waged in the Gulf. War termination was not well specified because we had no clear end state in mind.

President Bush stated four objectives for US involvement in the Gulf War: (1) withdrawal of Iraqi forces from Kuwait; (2) restoration of the legitimate government of Kuwait; (3) protection of Saudi Arabia and other states in the Gulf from Iraq (which implicitly guaranteed the flow of oil from the Persian Gulf); and (4) protection of American citizens abroad.⁶ We accomplished the first two of these political goals. The third and fourth constitute an open-ended commitment that we may have to demonstrate again. According to the operations order, the military objectives for Operation Desert Storm were to “[1] Attack Iraqi political/military leadership and command and control; [2] Gain and maintain air superiority; [3] Sever Iraqi supply lines; [4] Destroy chemical, biological and nuclear capability; [5] Destroy the Republican Guard forces; and [6] Liberate Kuwait.”⁷ We achieved items (2), (3), and (6). Item (1) proved a partial success at best, and we did not accomplish items (4) and (5).

Two divisions of the Republican Guard along with nearly seven hundred tanks escaped north to Basra, avoiding capture or destruction – likely outcomes, had Gen Frederick Franks and VII Corps moved faster at the outset and not turned as they did. Safwan was not even in our possession when we designated it the site for talks after a cease-fire. We returned Iraqi prisoners without liberating captive Kuwaiti citizens in return and allowed the Iraqis to use helicopters to put down nascent rebellions among Kurds in the north and Shiite rebels in the south, both of whom we had encouraged in their efforts against Saddam. It was not our finest hour.

Technology (PGMs) Won the War

In 1991, approximately 85 percent of smart bombs hit within 10 feet of their aiming points.

Richard Hallion, *Storm over Iraq* (1992)



High technology certainly did play a role in the Gulf War, but it had as much to do with communications, surveillance, navigation, and the use of space-based assets as with PGMs

In the Gulf War, we enjoyed a several-orders-of-magnitude improvement in aerial bombardment, compared to our previous experiences. The combination of stealth and precision-guided munitions (PGM) may provide a vast improvement in accuracy and capabilities. But there is more to it than that. The simplistic image of a bomb going down an air vent, as replayed on CNN many times, is not an accurate reflection of the reality of aerial bombardment in the Gulf. It belies the true accuracy and frequency of use of PGMs. The great bulk of ordnance used – roughly 95 percent – consisted of “dumb” bombs, not “smart” ones. We are still far from the much ballyhooed “one target, one bomb” claim issued immediately after the war by defense contractors and Air Force leadership. A Government Accounting Office (GAO) assessment⁸ of the effectiveness of the Gulf War air campaign suggests that although the results were a great improvement over previous air campaigns, they were nowhere nearly as good as claimed.

High technology certainly did play a role in the Gulf War, but it had as much to do with communications, surveillance, navigation, and the use of space-based assets as with PGMs. The role of the Global Positioning System (GPS), secure satellite communications, night-vision devices, and massive aerial refueling and tanker operations was routinely more important than that of smart bombs, antiradiation missiles, cruise missiles, and Patriot missile defenses against Scud missiles. Things that didn’t go “bang” were the more important technological accomplishments. But our lead in these areas of military technology is dissipating rapidly. One can buy GPS receivers commercially; contract with private companies to get overhead space imagery; and use notebook computers, cellular phones, and direct-broadcast satellite capability to run a war from virtually anywhere.





Effects are the important metric, and PGMs give us an order-of-magnitude improvement over bombing results in the past. This development makes modern war a very expensive proposition. The biggest problem in realizing the potential of PGMs with one-to-three-meter accuracy is that they require one-to-three-meter precision intelligence to enable them. We're not there yet.

The “Vietnam Syndrome” Is Over: US Military Might and Prestige Are Restored

When we win, and we will win, we will have taught a dangerous dictator and any tyrant tempted to follow in his footsteps that the US has a new credibility and what we say goes.

George Bush, 1 February 1991

I guess Slobodan Milosevic, Raoul Cedras, Mohammed Farah Aidid, and the leaders of North Korea weren't watching the Gulf War or listening to President Bush. The half-life of this demonstration in military capability, at least in terms of conventional deterrence or diplomatic leverage, seems to have been very short – if it ever existed at all. We seem to have no more impact on events since the Gulf War than we had before it. Under the Clinton administration, amid the shambles of Bosnia, Rwanda, and Haiti, one could argue that we have considerably less to say about conflict in the world than we had during the bad old days of the cold war. Saddam Hussein still threatens Kuwait despite what we both say and do.

If anything, the United States is even less willing, or more reluctant, to go to war now than it was before the Gulf War. The unique aspects of the Gulf War set an unrealistic standard that we will likely never realize again. These aspects included a quick, high-technology, low-casualty, coalition war, all of which are unlikely to be repeated collectively again. Hence, to the degree that they represent the public's test of military success in the American democracy, the standard may prove too difficult to replicate. If it can't be replicated, it was an anomaly that says little about current or future US military performance in war. The American public has little stomach for war and is becoming disenchanted with humanitarian missions as well.

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As mentioned above, the United States has approximately 40 percent fewer military forces to devote to fighting a war than it had in 1990. By 1997 the defense share of the gross national product was the lowest since before Pearl Harbor. We will have a 340-ship Navy, down nearly 50 percent from the goal of the Reagan years, and an Army with significantly reduced manpower. The reserve components of the US armed forces have long outnumbered their active duty counterparts. Citizen soldiers are a proud part of America's military tradition, but we cannot fight a war without mobilizing the reserves, and there are political as

More American lives were lost (18 killed and 76 wounded) in a single, violent firefight in Somalia – a peacekeeping operation – than during a single combat incident in the Gulf War

well as economic consequences to doing so for long or with frequency. Given our propensity of late to shake first a fist and then a finger, the United States is even less effective in deterring would-be aggressors than in the past. More American lives were lost (18 killed and 76 wounded) in a single, violent firefight in Somalia – a peacekeeping operation – than during a single combat incident in the Gulf War.

We Can Do It Again If Necessary

On Alert for Desert Storm II

Newsweek, 17 October 1994

Social Security has defeated national security as the main issue for the US body politic

We might fight and win a Gulf War II ultimately, but we could not do so quickly and with few friendly casualties unless we used weapons of mass destruction. Conventionally, it would be very much more difficult. This is true for reasons that are political and economic as well as military. Politically, several factors have changed. Turkey now has a fragile coalition government as well as a growing Islamist movement and political party. Next time, that country may or may not grant us use of its airfields or permission to launch offensive operations – NATO member or not. Without Egyptian overflight rights and the use of Cairo West as a staging area, merely getting there may be difficult or impossible. In the future, given the strength of Islamic fundamentalism in the country, Egypt may not be able to support us as it did in the past. In addition, one senses that the aftermath of the Gulf War – not to mention Somalia, Bosnia, and Haiti – may have sapped American strength and will rather than bolstered them. Social Security has defeated national security as the main issue for the US body politic.

Given our peacekeeping experience (Somalia, Bosnia, and Haiti), the political instability of major allies (France and Germany), and the economic disruptions in the world economy (Japan and East Asia), the willingness to join in another international effort may be slim to nonexistent. Currency fluctuations, national-debt levels, inflation, high unemployment, sluggish world trade, and recessions in many allied nations make contributions to such an effort on the scale of the Gulf War highly improbable. Saudi Arabia now has huge debts and is borrowing to pay interest and make defense purchases. The oil glut means that most Middle East revenues have fallen and remain at very low levels. Japan can no longer contribute the financing of another Gulf War, and the turmoil in Asian stock and currency markets makes us all more fragile.

If things appear bleak on these fronts, they may well be worse militarily. Despite new materiel coming on-line, at the moment we do not have the excess stocks of munitions consumed in the Gulf War, the transport capacity, or the large numbers of personnel to do it again as quickly or easily. The services are rife with problems of recruitment, retention, and readiness. We do not have some bases in Europe from which to generate tankers or provide ramp space to support the ferrying of combat aircraft to the Gulf theater. The downsizing of the US military establishment means that the United States now has eight fewer divisions in the US Army; 20,000 fewer active duty marines; 14 fewer fighter wings in the Air Force; and 182 fewer ships on active duty in the Navy than it did when Saddam invaded Kuwait.⁹

Others Paid for the Cost of the War

Estimated cost of the Gulf War as of 20 April 1991: \$100 billion.

US General Accounting Office

Others did pay for the great bulk of the cost of the war. They paid for over \$49 billion of the total cost of \$56 billion. But the United States still put up \$7 billion for the effort and forgave Egypt \$7 billion in debt to have it participate in the 35-member coalition. We paid for fewer of the direct costs of this war than of any war we have ever fought as a nation. Although that may be good on one level, cartoons of a US GI with tin cup in hand in front of coalition members were not a positive commentary on our circumstances. GAO estimates of the direct costs of the war are more than double what we collected.¹⁰ Our total is closer to \$100 billion. But direct war costs to eventual war costs for the United States yield an average ratio of one to three. That is, the total cost of the Gulf War – after we factor in medical costs, pension costs, survivor benefits, and so forth – will be more like \$300 billion. This may sound far-fetched, but it is not. In 1990 when the Gulf War started, the US government sent out 51 cheques for survivor benefits to relatives of veterans of the US Civil War! Thus, the monetary costs alone are far greater than we have led the public to believe. Budget difficulties caused by redeployments to the Gulf, a lack of supplemental funding for peacekeeping operations, and the battle between readiness and modernization have conspired to make things even worse.

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But the US military is still feeling the real costs of the Gulf War. Medical and retirement costs will continue for a century. Equipment costs are also significant. Approximately one-third of the C-141 cargo-plane fleet was in depot maintenance during the year following the Gulf War. We are retiring C-141s three times faster than we are acquiring their replacement C-17s. The life of engines, airframes, onboard computers, control systems, wing spars, and so forth on nearly all the aircraft utilized during



The United States is paying, and will continue to pay, for the cost of the Gulf War in increased maintenance, shortened life of weapons systems and platforms, and replacement of equipment expended from surplus stocks during the Gulf War. The last of the F-15Es from the 4th Wing at Seymour Johnson AFB, North Carolina, which were among the first to deploy in August 1990, didn't return home until July 1994, after supporting the no-fly zones in Iraq. They have many more hours on their engines, and the airframes have been badly degraded by sand, heat, and desert sun, as well as increased rates of use. This is just one example. Because of downsizing throughout the military, the United States will attempt to field a force with fewer people; fewer reserves; less maintenance capability; fewer spare parts; more miles on aircraft, ships, and vehicles; and less margin for error and redundancy than was the case before the Gulf War.

Gulf War Represents an Almost Unblemished Record of Success, Superior Military Performance, and Accomplishment

Public confidence in the military has soared to 85 percent, far surpassing every other institution in our society.

David Gergen, *US News and World Report*, 11 February 1991

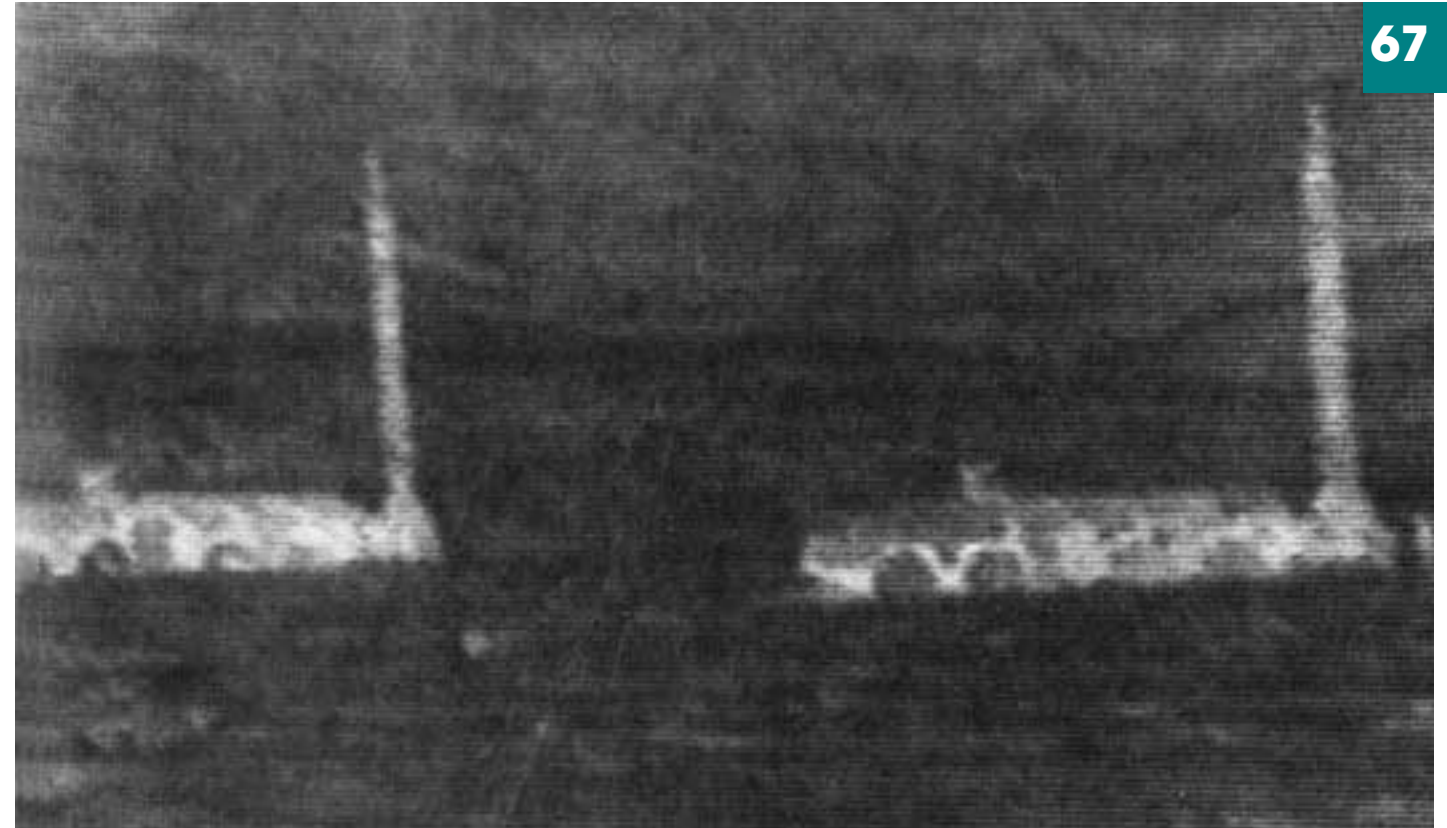
the Gulf War and the ensuing no-fly zones has been seriously degraded. Although operational readiness rates were maintained at an average of 90 percent or better for nearly every type of aircraft used in the Gulf War, spare parts – together with the frequency and intensity of required maintenance – have a delayed cost of considerable magnitude. Mission-capable rates are down and still falling in many units, while cannibalization grows.

...the United States will attempt to field a force with fewer people; fewer reserves; less maintenance capability; fewer spare parts; more miles on aircraft, ships, and vehicles; and less margin for error and redundancy than was the case before the Gulf War

Despite an overwhelmingly positive display of military prowess and accomplishment, the failures of the Gulf War are many, large, and of considerable significance. We tend not to pay heed to them or give them the dissemination and discussion they deserve. Without seeking to take away from the very considerable accomplishments of our men and women in the armed services who performed admirably in the Gulf War, we must address some glaring failures. The bulk of these involved targeting – especially the failure to identify, locate, and destroy such salient targets as the key elements of Iraqi capability. Taking them out is serious business. We must improve our capacity to locate, identify, target, and destroy key targets – military and political.

The inability to locate and destroy Scud missile launchers (there is not a single confirmed destruction of a mobile Scud launcher during the Gulf War) is the most serious failure. As it turned out, the Iraqis had nearly double the number of mobile launchers we thought they had – some 220 total. We flew twenty-five hundred sorties against them.¹¹ Although we took out several fixed sites, we did not do well at all against mobile ones. Despite flying an average of 11 sorties per launcher, we left Saddam with many – and over two hundred Scuds as well. This is regrettable all the more because it is not a novel problem but an old one that we ignored. Scuds were reminiscent of V-2 missiles from World War II. We had no better solution for them in 1991 than we did in 1944. All we could do was bomb the launch sites, hope we got lucky, and eventually overrun them on the ground. We didn't.

But there were other failures that we must contemplate and correct as well. These constitute problems that we caused ourselves. Most important among these was the number of deaths caused by friendly fire. That reality remained hidden until postwar investigations uncovered the problem. During the war, we created too good an image of our military prowess on television and a tendency to claim more than was our due. Nearly every initial claim later proved overblown. This in turn led to



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Airpower came closer to being decisive in the minds of most people, but it did not achieve victory. Ironically, even its success was not unique

have a fetish for firepower over manpower. We would far rather spend dollars than lives. Airpower is the quintessential way to have standoff power that risks fewer lives than sending in ground-combat forces. There is no disputing that. Airpower can punish, severely diminish, and destroy large portions of enemy forces. It can do so rapidly and globally. Was it decisive in the Gulf War? Maybe. If your definition is “critically important,” the answer is yes. If it is “conclusive,” the answer is no. But airpower came far closer to achieving its goals and accomplishing our military aims than ever before. We should have known that it would.

We think we learn from the past, profit from our mistakes, and learn from previous experience so we won’t have to relearn painful lessons. Would that it were so. We have little sense of history. Hard lessons have a short half-life equal to about half a generation, let alone more. We often fail to learn what we should or forget what we think we have mastered. The following quotation is interesting in this regard:

an exaggerated faith in technology and, by extension, in our national security achieved through technological superiority. Alas, such is not the case. Many of the systems that appeared the most effective – for example, the Patriot antimissile missile¹² – have, upon closer scrutiny, proven to be almost militarily irrelevant in the war. Some very expensive weapons systems – notably the B-1B – didn’t participate. We simply do not have the resources to afford the redundancies of the past or to procure systems we don’t need or cannot or will not use.

The Promise of Airpower Was Finally Fulfilled

Gulf Lesson One is the value of airpower.

George Bush, 15 June 1991

Airpower did not win the war. It made it much easier for us to achieve the appearance of victory, but since that eluded us, we cannot say that airpower won. No one in the ground forces or among our coalition partners would have wanted to fight that war without the tremendous contribution that airpower made to it. But neither could the US Air Force, the major custodian of airpower, have “won” or achieved what was accomplished without the use of Navy, Army, and Marine air and surface assets, deployed or employed in the theater. Airpower came closer to being decisive in the minds of most people, but it did not achieve victory. Ironically, even its success was not unique.

To understand this point is critical. Democracies in general and America in particular have a fetish for firepower over manpower. We would far rather spend dollars than lives. Airpower is the quintessential way to have standoff power that risks fewer lives than sending in ground-combat forces. There is no disputing that. Airpower can punish, severely diminish, and destroy large portions of enemy forces. It can do so rapidly and globally. Was it decisive in the Gulf War? Maybe. If your definition is “critically important,” the answer is yes. If it is “conclusive,” the answer is no. But airpower came far closer to achieving its goals and accomplishing our military aims than ever before. We should have known that it would.

What are the chief lessons with the strategic use of air power in the last war?

- [1] One lesson is that the time we were given to make our preparations was an absolutely essential factor in our final success. . . . It is unthinkable that we should ever again be granted such grace.
- [2] Air power in this war developed a strategy and tactic of its own, peculiar to the third dimension.
- [3] The first and absolute requirement of strategic air power in this war was the control of the air in order to carry out sustained operations without prohibitive losses.
- [4] We profited from the mistakes of our enemies. To rely on the probability of similar mistakes by our unknown enemies of the future would be folly. The circumstances of timing, peculiar to the last war, and which worked to our advantage, will not be repeated. This must not be forgotten.
- [5] Strategic air power could not have won this war alone, without the surface forces. . . . Air power, however, was the spark to success. . . . Another war, however distant in the future, would probably be decided by some form of air power before the major surface forces were able to make contact with the enemy in major battles. That is the supreme military lesson of our period in history.¹³

That is an accurate assessment of the US performance in the Gulf War and sound advice for the future. It is a set of insights we would do well to heed. But it was not written about the Gulf War. It was written *45 years earlier* by Gen Carl A. “Tooeey” Spaatz as his assessment of the fulfillment of strategic airpower in World War II! If the promise of airpower was fulfilled, it was fulfilled in that war. The Gulf War was merely another demonstration of the effectiveness of airpower and the necessity for the United States to project power at great distance for strategic effect using the third dimension. Somewhere between World War II and the Gulf War, we either failed to learn or conveniently forgot these lessons. Why did airmen not understand what we had achieved over 50 years ago? How did they let these insights disappear from their understanding of war and the application of airpower? As Yogi Berra would say, “It’s déjà vu all over again.”

The Gulf War was merely another demonstration of the effectiveness of airpower and the necessity for the United States to project power at great distance for strategic effect using the third dimension

EPILOGUE

This list of myths of the Gulf War is not exhaustive. The image of prowess and success at very low cost that the public has of the Gulf War is a dangerous delusion. The myths reveal a gap between perception and reality. Unchallenged, they have distorted public perception of the Gulf War, our role in it, its significance, and the degree to which it should serve as a reference for future engagements abroad. A poor model on which to base assumptions about future wars, it was unique in many ways. All wars are.



We should not repeat the mythical lessons of our experience in the Gulf as a policy guide. These unfounded “lessons” of the Gulf War are dangerous in the extreme. Misperceiving to such a degree something as momentous and fundamental as a large-scale conventional engagement of international significance is a serious matter in its own right. Basing ill-founded policies on fallacious assumptions about the past, our strengths, and our supposed accomplishments is a volatile brew. Similarly, not understanding the essence of airpower and its contributions to how wars may be fought and won risks disaster via another route. If airmen don’t understand and articulate to others what airpower can do, who will? The implementation of Instant Thunder – the strategic air campaign plan for the Gulf War – was a very close-run affair, despite Spaatz’s comments of 45 years earlier.

Misreading ourselves or the world flirts with failure. Doing both virtually guarantees it. We have seen American power erode steadily, the Gulf War notwithstanding. It is a matter of attitude as well as aptitude. It is not our military might that is in question. Rather, it is our political purpose and ability to lead that is suspect. We are less likely to act unilaterally. Both our national security strategy and our national military strategy presume coalition warfare. We need others to permit, pay for, and participate in our wars. We have to have the approval of others to permit us to use military force abroad through UN sanctioning of our nascent crusades. We require others to pay for the use of our force abroad. And we wish others to participate in the application of that force, or we are reluctant to act.

The newfangled term *cooperative security* may be no less bankrupt than the collective security under the League of Nations in the 1920s and 1930s. Someone – usually the most powerful – must take the first step to intervene, whether it be to stop aggression, punish violators of human-rights standards, stop genocidal warfare, or save large numbers of lives amid the refugee crises of people fleeing famine and disease. Not doing some of these things may indeed be regrettable. But worse yet is to think we can handle all such problems, take the initiative to do so, and then find we are unable – even if not unwilling – to do so. That is likely to be the case, given the defense budgets and policies of the moment. The fact that this reality is at odds with public myths of the Gulf War represents a grave danger we should avoid. Understanding the myths of the Gulf War is a necessary antidote to having our moral and political reach exceed our military grasp.

NOTES

1. This is the title of one of the initial accounts of the Gulf War. U. S. News and World Report, *Triumph without Victory: The Unreported History of the Persian Gulf War* (New York: Times Books, 1992).
2. The average death rate for those personnel deployed in the Gulf was 69 per one hundred thousand. For males 20 to 30 years of age living in the United States during the same period, the death rate was 104 per one hundred

thousand. These comparisons are based on statistics provided by the US Department of Defense and the Metropolitan Life Insurance Company and are presented in “Harper’s Index,” *Harper’s*, May 1991, 17 and 70. One may find a more detailed study in James V. Writer, Robert F. DeFraites, and John F. Brundage, “Comparative Mortality among US Military Personnel in the Persian Gulf Region and Worldwide during Operations Desert Shield and Desert Storm,” *JAMA: The Journal of the American Medical Association* 275, no. 2 (10 January 1996): 118-21.



3. Dan Priest, "Military Reduces Presence in Gulf," *Washington Post*, 27 May 1998, 1A.
4. For varying analyses of Iraqi casualties and captured troops, see US Department of Defense, *Conduct of the Persian Gulf War, Final Report to Congress* (Washington, D.C.: Department of Defense, April 1992); Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey: Summary Report* (Washington, D.C.: Government Printing Office, 1993); RAND analyses cited in James A. Winnefeld, Preston Niblack, and Dana J. Johnson, *A League of Airmen: U.S. Air Power in the Gulf War* (Santa Monica, Calif.: RAND, 1994), 159; studies by George W. S. Kuhn, Alfred Hashim, and Anthony Cordesman referenced in *Triumph without Victory*, 406-8; and John G. Heidenrich, "The Gulf War: How Many Iraqis Died?" *Foreign Policy*, March 1993, 108-25.
5. Michael R. Gordon and Gen Bernard E. Trainor, *The Generals' War: The Inside Story of the Conflict in the Gulf* (Boston: Little, Brown and Company, 1995), 461.
6. President George Bush, "The Deployment of US Armed Forces to Saudi Arabia," address, 8 August 1990, reprinted in *Military Review*, September 1991, 82.
7. Less the numbers inserted for reference, they come verbatim from CENTCOM Operations Order 91-101, dated 17 January 1991. Cited in Rick Atkinson, *Crusade: The Untold Story of the Persian Gulf War* (Boston: Houghton Mifflin, 1993), 20-21.
8. See United States General Accounting Office, *Operation Desert Storm: Evaluation of the Air War*, GAO-PEMJD 96-10 (Washington, D.C.: US General Accounting Office, July 1996). For a synopsis of the GAO report, see Tim Wiener, "'Smart' Weapons Were Overrated, Study Concludes," *New York Times*, 9 July 1996, A-1, A-7. For earlier reports of the inaccuracy of Gulf War munitions, see Vincent Kiernan, "Gulf War 'Hits' Were Often Misses," *New Scientist* 139, no. 1889 (4 September 1993): 8.
9. Data comparisons are from figures provided in the 1990 and 1996 issues of *Defense Almanac*.
10. For a detailed breakdown of the accounting, see House, *Statement of Frank C. Conahan, Assistant Comptroller General, National Security and International Affairs Division, US General Accounting Office, before the Committee on the Budget: Cost of Operation Desert Shield and Desert Storm and Allied Contributions*, 15 May 1991, GAO/T-NSIAD-91-34.
11. See the discussions in Winnefeld, Niblack, and Johnson, 132-34, 166-67, and 269.
12. A rather unseemly but terribly important private, then public, debate erupted between Dr. Theodore Postol of the Massachusetts Institute of Technology on the one hand and Raytheon (makers of the Patriot) and the US Army on the other, with a flurry of charges and countercharges. Raytheon was banking on some \$3 billion in Patriot sales, which Postol's analysis placed in jeopardy. The saga is recounted in Stephen Budiansky, "Playing Patriot Games," *U.S. News and World Report* 115, no. 20 (22 November 1993): 16; Seymour Hersh, "Missile Wars," *The New Yorker* 70, no. 30 (26 September 1994): 86-98; and Jock Friedly, "MIT Torn by Bitter Dispute over Missile," *Science* 271, no. 5252 (23 February 1996): 1050-52.
13. Gen Carl A. "Tooey" Spaatz, "Strategic Air Power: Fulfillment of a Concept," *Foreign Affairs*, April 1946, 394-96. (Paragraph numbers have been added for clarity.)

The quality of a person's life is in direct proportion to their commitment to excellence, regardless of their chosen field of endeavor.

Vince Lombardi

CONTRIBUTOR

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The **THIRD ELEMENT** **THIRD ELEMENT**

A UK Perspective on Information Warfare





Information Warfare is in vogue with militaries in the West. We are, according to the debate, in the midst of a Revolution in Military Affairs (RMA) that sees the Information Age as a Third Wave paradigm shift.¹ Whilst much has been written in the US in an ever increasing deluge, bordering on paranoia, little has emerged from the UK. Notwithstanding the existence of an RMA or, as many believe, a Military Technical Revolution,² the issues revolve around how information is treated, its place in operations, its accuracy, expediency and distribution. Much comment has concentrated on the technology itself when, in fact, this is only part of the story. Technology, like any other tool, is useless without the skilled handling by the individual and the organization – a third element is missing.

Abundant and widespread information networks have been driven by systems people without a clear requirement from the operators. It is no surprise therefore that vulnerabilities are rapidly growing, given the lead of technology over business need. This trend must be reversed through the development of doctrine, management and organizational change. In an era of increasingly limited warfare when intolerance of casualties and collateral damage is at an all time high, the time would seem to be right for suggestions for alternative methods of warfighting to be heard by the highest political levels.

It is therefore the intention of this study to offer a British perspective and attempt to shed some light on the way ahead for the UK. By establishing what IW is, why is it becoming so important to defend against it and how it could be adopted as an offensive capability, it is hoped to be able take the debate further. Though this essay will concentrate on the military-strategic level, the reader should recognize that the civilian and military aspects are closely related and in some instances, inseparable. Despite the fact that liberal governments are increasingly sensitive to the use of the word 'Warfare' in this subject, I will continue to use the term IW rather than Information Operations – the reader could well treat them as synonymous. I believe IW reflects more of the military aspects of the subject – to examine the whole of Information Operations would demand analysis of government, corporate and societal activity and would be too wide a scope. This paper proposes that although the Technology and Infrastructure elements of IW are in place, the final, crucial element, Organization & Doctrine, must germinate before IW can be a viable option in contemporary conflict.

WHAT IS INFORMATION WARFARE?

The power of computers in general, and of IW in particular is not well understood by the public or most military or national leaders.³ It is often useful, therefore, to start an analysis with an attempt at defining the key aspects of the argument. As with many topics, definitions are very much in the eye of the beholder; they vary, sometimes, towards the opposite extremes. In desperation, authoritative sources are quoted; these typically include dictionaries or endorsed papers. IW is no exception and is probably one of the more difficult definitions to capture. Many variations of the definition of IW exist and much time has been spent searching for agreement. Pinning down a concept through definition is predominant in the military. Doctrine manuals are becoming widespread and lead off in a mantra that students are expected to learn, parrot fashion, in order to progress and gain understanding. A definition shared by both NATO and the UK, IW is quoted in US Joint Doctrine for Info Operations, JP3.13, as being:

Information Operations conducted during time of crisis or conflict to achieve or promote specific objectives over a specific adversary or adversaries,

having previously defined Information Operations as:

actions taken to affect adversary information and information systems, while defending one's own information and information systems.

A variation from US Air Force Doctrine expands further:

Information Operations (IO) – Those actions taken to gain, exploit, defend, or attack information and information systems and include both information-in-warfare (linW) and information warfare (IW) and are conducted throughout all phases of an operation and across the range of military operations.⁴

Specific UK definitions, whilst agreed between the MOD and the Cabinet Office, have not yet been published. British Defence Doctrine, Joint Warfare Publication 0-01, currently being rewritten by the recently formed Joint Doctrine and Concepts Centre, makes only a passing reference to IW, stating that 'the objective should be to achieve information dominance over the opponent'.⁵ These definitions imply that Information Operations are conducted all the time and apply to a far wider audience than just the military. Was Rupert Murdoch's intervention to prevent Harper Collins from publishing Chris Patten's book, heavily critical of the Chinese, a denial of information that would fall under Information Operations? Murdoch was accused of

Murdoch was accused of altering the content of News Corp ventures to avoid offending the Chinese government and thus protect his business interests in China

altering the content of News Corp ventures to avoid offending the Chinese government and thus protect his business interests in China.⁶

Rathmell suggests that IW can be broken into three classes: Category I-new techniques applied to traditional activities; Category II-old techniques applied to new activities and Category III-new techniques applied to new activities – this last category being the most demanding.⁷ Schwartz defines IW, using a similar trinity of classes, under the headings Personal, Corporate and Global,⁸ each an incremental increase on the previous with effects only varying by degrees of scale. In contrast, Arquilla and Ronfeldt, offer a distinction between what they call “Netwar”, a societal-level, ideational conflict waged in part through internetted modes of communication and “Cyberwar” at the military level. Cyberwar may be to the twenty-first century what *blitzkrieg* was to the twentieth. Whereas Cyberwar refers to knowledge-related conflict at the military level, Netwar applies to societal struggles most often associated with low intensity conflict by non-state actors, such as terrorists, drug cartels, or black market proliferators of weapons of mass destruction.⁹

Whilst definitions are a useful area for the protagonists and specialists to debate, there is a danger of spending too much time over nomenclature when more effort placed in evangelism and understanding the issue, its consequences and possible

The new concept, struggling to emerge, is the use or targeting of information itself, as a battle winning opportunity, or threat, depending on your perspective

solutions would reap greater benefit. The new concept, struggling to emerge, is the use or targeting of information itself, as a battle winning opportunity, or threat, depending on your perspective. Arquilla and Ronfeldt, moving on from their earlier theses of Cyberwar and Netwar, propose that information has begun to acquire new meanings and imply new possibilities, beyond the dictionary definitions. Closer examination, they suggest, reveals two widespread definitions of information, first as a message and second in terms of a medium. A third more esoteric definition proposes information to be a physical entity, similar to mass and energy. The first

proposal is the one that sits most comfortably with the majority of stakeholders. It suggests that information lies in a pyramidal hierarchy that has a broad base of disorganized raw ‘data’ and ‘facts’, atop which sits a layer of organized ‘information’. The next, smaller stratum relates to a refinement into ‘knowledge’ and finally, at the peak resides the ultimate ‘wisdom’ (understanding).¹⁰

If IW is Information Operations focused in time, space and context then a clearer understanding emerges. IW is not the bailiwick of the military alone - the recent Strategic Defence Review recognised that ‘The threat to information infrastructures is not just a defence issue’.¹¹ A later essay states that under Military Task 26: Military Home Defence, the Government has an obligation to ensure the

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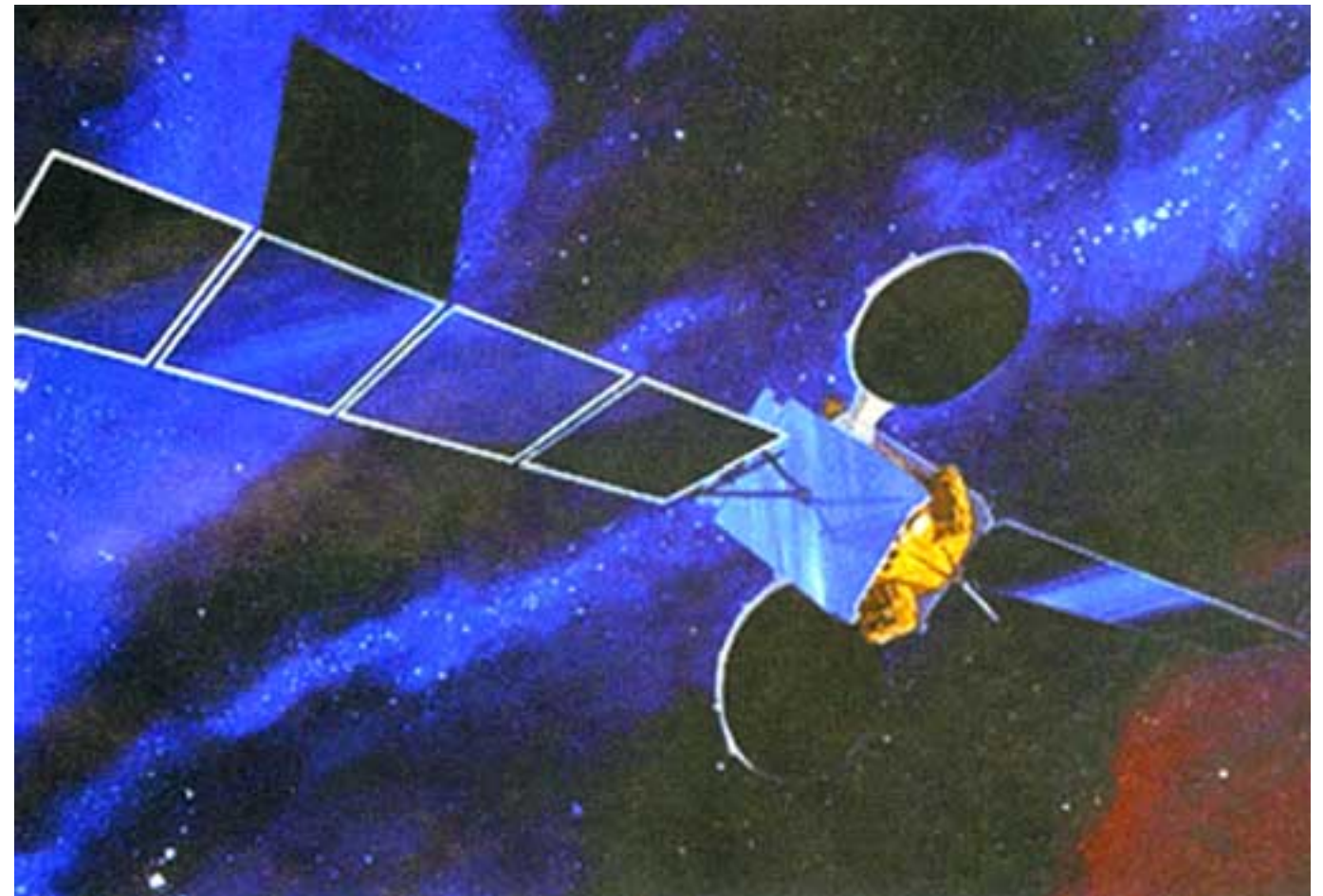
provision of critical services and the functioning of government itself during times of crisis and conflict. This is achieved primarily by the protection of critical installations and information systems.¹² It is unfortunate that the essay goes no further as such a statement covers a whole range of possible responsibilities. The first task must therefore be to establish how vulnerable the military and the Critical National Infrastructure (CNI) really are, in the same way that the US President's Commission on Critical Infrastructure Protection was formed under the Department of Justice to review the US National Information Infrastructure.

An information system could be a telephone network, a predominantly civilian infrastructure that has high value to both military and civilian alike. It is estimated that over 95 per cent of all US military traffic passes over the civilian telephone system – a similar reliance exists in the UK. The CNI is as vital to the military as it is to the population it serves. Indeed, with a continuing drive to shed military roles to 'private partners', this reliance on the CNI is set to increase. The UK Government, after a slow start, is waking up to the implications of IW, acknowledging that 'our dependence on information technology is such that it takes no genius to appreciate that not only enormous benefits but also massive new potential vulnerabilities have thereby been introduced'.¹³ Emerging UK policy aims to enable 'both the public and private sectors to operate in an environment which has been shaped in such a way that would-be attackers are deterred and international commerce continues to be attracted to operating with the UK'.¹⁴

It is also useful to look at what IW isn't – Information *in* warfare (linW).

Information-in-war involves the Air Force's extensive capabilities to provide global awareness throughout the range of military operations based on integrated

...were an adversary to deny access to or exploitation of the GPS network, then navigational and weapon strike accuracy might be degraded, but not to the point where offensive operations couldn't be continued



intelligence, surveillance, and reconnaissance (ISR) assets; its information collection and dissemination activities; and its global navigation and positioning; weather; and communications capabilities.¹⁵

For example, were an adversary to deny access to or exploitation of the GPS network, then navigational and weapon strike accuracy might be degraded, but not to the point where offensive operations couldn't be continued.

Many observers state that IW is nothing new, that it has been going on for centuries. Well, perhaps this is true but perhaps there is a degree of confusion with what is more accurately labelled linW. It is a truism to say that information, data, intelligence, call it what you will, is a fundamental ingredient of any major activity. 'Know your enemy...' and other aphoristic cuttings from Sun Tzu are useful educational tools but fail to really shed any light on IW. It has always been the aim of a military operation to deny the opposing commander the ability to command and control his forces. Called (unsurprisingly) Command and Control Warfare (C2W), this strand of warfare is not a thing in its own right but a means to an end. If you are able to successfully win the 'C2W battle' the war is not over – you still have to defeat the fielded forces and, more often than not, induce a territorial shift by physically discharging the 'unlawful' occupants of a disputed region or area. C2W or in its latest guise, IW, can never replace conventional warfare, however limited that becomes. As Brigadier General Marshall wrote:

Once the total contest between societies is predicated, it becomes impossible to write off the ultimate clash between the masses of men who fight on foot. They are the body of national defence...There is no other way out. The society which looks for an easier way is building its hopes on sand.¹⁶

The Gulf War has been heralded by many observers as the first Information War.¹⁷ Military firepower was overwhelming on the US order of battle alone, never mind the addition of the coalition assets. Indeed, the coalition and the US in particular, employed and relied upon the latest technology which, coupled with an organizational and training advantage, gave a clear edge over the Iraqi forces. Caution was ever present during the planning and build up to the

The Gulf War has been heralded by many observers as the first Information War. Military firepower was overwhelming on the US order of battle alone, never mind the addition of the coalition assets



coalition offensive. With the ghost of Vietnam in the forefront of all thinking, numbers were increased on more than one occasion to ensure that, when battle was drawn, the allies would have the upper hand. But this, I suggest, was the one and only showing of the classical 'Cold-War Machine' and was Information *in* Warfare taken to its most developed form. Information was essential to the conduct of operations but those operations were conventional counter-force, not counter-information. Although a distinct and developed psychological operations campaign was successfully executed, critical to the subsequent land phase of the conflict, little opportunity either existed, was recognized or was sanctioned for the coalition to strike at the information heart of the Iraqis. Moreover, the conditions for the Gulf War, like so many others, were unique. As a third-class Soviet clone, Iraq was a perfect enemy that particularly suited the US led manoeuvre warfare;¹⁸ it was a unique and distinct coalition of regional protagonists and the sole effective World super power. The techniques and tactics employed exploited technology wherever possible but were successful largely because of superior organization and operational art. However, information failures occurred: as the US Navy's communications systems were largely incompatible with those of the predominant USAF, the Air Tasking Order had to be flown to the ships daily by helicopter. Delays often reduced the planning time available to co-ordinate RAF and US Navy combined missions.¹⁹ The attritional stance adopted by the Iraqis was, from their perspective, the way to win the war – US citizens receiving a blow by blow account on CNN would soon capitulate when the body bags began to pile up. Yet, it became clear to any potential adversary to the US that the asymmetry between conventional forces is likely to be so great that, if conflict arises, an adversary must look for other ways to inflict pain on the World's current superpower – IW could be one such way.

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IW consists of a triumvirate of Technology, Infrastructure and Organization & Doctrine. The technology matures at an incredible rate, and according to Gordon Moore of Intel, the number of transistors on a chip of a given size doubles every 18 months. This 'Moore's law' means that the amount of computing power available at a given price also doubles every 18 months.²⁰ No sooner has a new discovery or manufacturing technique emerged, a step change follows in the performance/cost ratio. What was good yesterday is now woefully inadequate as the continual hardware growth has done little to encourage software writers to develop their skills. So called 'Bloatware' gives rise to excessive code that is error-prone, part undocumented and susceptible to software interference (viruses, etc).²¹



The Internet, a 'straight research project without a specific application',²² born out of a DoD initiative called ARPANet, has grown at an equally alarming rate and in doing so, provides an infrastructure that is not only global in nature but also largely uncontrolled. As the 'Wild West of cyberspace',²³ no one owns the Internet and rules and standards, despite the efforts of those who would want to control even a piece of it, are decided upon by the mass of users and a handful of technical specialists.

What is missing or at least is the most poorly developed is the Third Element – organizational change and an underpinning doctrine. Unfortunately, this Third Element of IW has the longest gestation period. Policy and doctrine take months, sometimes years to co-ordinate and agree not only between national actors but also between friends and allies. For this reason alone, it is time to move on to try and close the gap between vulnerability and capability.

WHY WILL IT BE SO IMPORTANT?

Defensive Imperative


With the well established doctrine of overwhelming conventional military force driven primarily by the US but aspired to by the West, a perpetual state of asymmetry exists between future coalitions (including the US) and global adversaries – with the exception of China. The only way for a foe to fight back, on equal terms, would appear to be through terrorist and other exploitable differences. The vulnerabilities, being recognized in a dawn of new understanding, are in Information Technology, Information Systems and electronically stored data.

It understandably worries the US that of all PhD degrees awarded in computer security by US universities, 60 per cent went to citizens of Islamic or Hindu countries

Arguably initiated by the Gulf War and the Toffler study *War and Anti-War*, the US, not surprisingly, are taking a proactive lead. In an ever-tightening process of federal funding, successful programmes have tended to include some aspect or other of IW. It understandably worries the US that of all PhD degrees awarded in computer security by US universities, 60 per cent went to citizens of Islamic or Hindu countries.²⁴

Actual attacks like the Solar Sunrise incident or the DoD sponsored exercise, Eligible Receiver have done much to highlight the vulnerability that the US faces, both in the military and in civilian spheres. Eligible Receiver caused quite a stir, bordering on hysteria. Journalists such as James Adams proclaimed that 'the exercise showed that an electronic Pearl Harbour is not only possible today, it could be completely successful.'²⁵ However, Adams' postulations and theories have not always been met with acceptance. Indeed, many criticised his work, *The Next World War*, for passing on myths and April Fool's jokes, such as the Gulf War virus hoax, as fact.²⁶ This highlights a problem faced by the US in that the excitable who write on the subject often go



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over the top, inducing an unhelpful paranoia and thus precipitating a serious risk of misdiagnosis. Other doomsday scenarios of total failure of the telephone network, attacks on the New York Stock Exchange, random crediting and debiting from automated teller machines and denial of air traffic control services are commonplace.²⁷ Clearly a happy medium exists between wild exaggeration and uneducated dismissal. What is unsettling for the US in the case of Eligible Receiver, is that the vulnerabilities exposed by the exercise were known about with fixes suggested – only a few units had bothered to implement them.

High Energy Radio Frequency (HERF) weapons were the subject of a sworn testimony given by Lt Gen Robert Schweitzer before the House Joint

Economic Committee, US Congress. In his verbal and written submission, Schweitzer made it quite clear that RF weapons posed a considerable threat to not only military systems, but perhaps more disturbingly, the civilian infrastructure. An attack on Wall Street's computers could be executed through knowledge and equipment available from the Internet and from retail outlets at a cost of a few hundred dollars. Whilst a lot of the scare mongering in the US has the traditional inter-Service battle for federal funding at the heart, not all should be dismissed lightly. In the UK, British Aerospace takes the threat posed by high-energy weapons equally seriously. Such devices are so cheap to build, easy to deploy and conceal and difficult to detect as the source of massive computer failure that they are sure to be high on the list of desirables of any half-competent terrorist organization.²⁸

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In the New World Order that has replaced the bipolar Cold War, risk has a greater emphasis in strategic planning. The pressure on the public purse to take the so-called peace dividend has proved irresistible – now the only way to make the books balance is to increase the emphasis on risk. Such ventures into risk management, hitherto alien business speak, have revealed the need to trust Commercial Off The Shelf (COTS) products to perform critical tasks at critical times. The drawback to huge R&D savings realized by the abandonment of bespoke software, is the risk of at best, bugs and at worst, Trojans or logic bombs that lie dormant, waiting for an activation signal or event.²⁹ Microsoft Office, used by the vast majority of businesses and militaries the World over, demonstrates the ease at which Trojans can be incorporated. So-called ‘Easter Eggs’ are software coders ‘bit of fun’ to demonstrate both coding proficiency and uncontrolled power. By following a series of keystrokes in Microsoft Excel 97, the program executes an audio-visual routine that is completely unrelated to the original purpose of the software – this popular and much praised spreadsheet program contains a fully functional flight simulator.³⁰ Although benign in the case of Excel, the implications for militaries that depend on COTS software for mission critical tasks are clear.

This dependence on the likes of Microsoft is going to increase and signals a distinct loss of control by the military. Moreover, that an increasing amount of software is now written in India in a collaborative California/Bangalore 24-hour, non-stop cycle, will only proffer further opportunity by non-western, culturally diverse software engineers to introduce ‘extras’.³¹ Even with control over your supplier in traditional procurement arrangements like those in place for Eurofighter, the fact that software programs increasingly run to millions of lines of code means that it is virtually impossible to fully error check a program before it is introduced to service.³²

The risk increases as modern, next generation weapon systems such as Storm Shadow are introduced. A long range, stand-off missile, Storm Shadow relies on accurate target data and navigation information to successfully home to the target. Without a man-in-the-loop, it is particularly vulnerable to misinformation and seduction. With a continuing trend to push the man back in the loop, away from the target area, effort must be placed into defensive and protective measures to ensure that such lone weapons reach their target.

In what Luttwak called the paradoxical logic of strategy,³³ each advantage that the West gains from the use of networked information systems brings a home disadvantage and potential opportunity for the adversary. Greater integration of information systems has major benefits, but it also introduces new risks and offers new opportunities for an adversary to attack our information networks, thus degrading the fighting effectiveness of our forces.³⁴ The more ‘wired’ a country is, the more vulnerable it is to this sort of [Cyberwar] attack.³⁵ The asymmetry arising from considerable conventional force, reliance on information systems and uncoordinated defence leaves the UK unnecessarily open to alternative means of attack. If nothing else is done, this threat to the flanks must be addressed.



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Offensive Potential

The seeds were sown for an irreversible change to the face of warfare after the US experience in Vietnam. No longer would Western society put up with high losses and casualties. This was a limited war and limits were expected by the distant American people. Such was the pressure of public opinion that political leaders got involved in military planning details of such low magnitude that further damage was done in this first media war. The principle that 'for the moment, war is more a matter of choice than of fait accompli' was clearly established – a sea change had occurred.³⁶

In 1991, The Gulf War became an information war, not as I have suggested earlier in the way in which it was conducted, but in the way in which it was watched, analyzed, assessed and influenced by a global population.

More information was flowing over the media networks to a World which watched the proceedings in near real-time, from the comfort of an armchair, than had ever happened before. Every decision, execution plan and subsequent operation was analyzed by closet experts, hired by the broadcast and print media and consumed by an ever-hungry general public. Here the OODA loop was being spun in the presence of the masses who, on the basis of sound-bites and context-free clippings, exerted considerable influence on the political decision makers.³⁷ The Al Basra 'Highway of Death', emotively labelled and exposed on prime-time TV, led to Bush calling a halt to hostilities and quashed any additional thoughts of pursuing Saddam to Baghdad. As Michael Evans, Defence Correspondent to The Times said, 'all wars have been completely transformed, whether they be peacekeeping [operations] or high intensity wars, by the presence of the camera'.³⁸ Indeed, a new form of statesmanship exists which depends less on the individual qualities of our leaders and more on the skill of their spin-doctors and their ability to manage the perception of the people. This creates a second

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battlefield where the media and the ‘management’ strive to get their message across. The grisly, real time reporting of the World’s atrocities force the ‘must do something’ reaction that has become so prevalent in Western foreign policy. The strength of the images on our television sets can swing previously resolute governments into taking action that they would otherwise have avoided. Eighteen dead Marines in Somalia in 1994 did more to change US foreign policy than any other single issue – the vivid and disturbing images of a marine being dragged through the streets still haunt both civilian and politician alike.³⁹ Imagine the consequences, had the BBC been on the ground during the bombing of Dresden in World War II.⁴⁰ The insatiable public feed off the images they see, taking without the question the selected edits presented on the ‘box that never lies’. Do something about it but don’t send our boys home in bags.

But the classical point is so often missed – war is dangerous. It is not a pleasant activity that occurs between 6 and 9pm for the benefit of the World’s viewers. It is a life and death struggle based on ideology, religion, hatred and oppression and, as such, has few boundaries for those directly involved. When people fight for their very existence, they will do so to the death. The West doesn’t like it. So when calls to intervene are eventually accepted,

when the pressure to ‘do something’ reaches that critical point, the basis of international law and sovereignty are ignored and a force goes in to sort it out. But in doing so, it is imperative that only the military targets, as identified, are the subject of attack. *Ius in Bello*, how force is used in war, is paramount for those who believe they are morally just. Any accidental attacks on the civilian populace will not be tolerated, nor will damage to their physical surroundings be accepted: a particularly tall order as the



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...opposition, present and future, are learning quickly that high value items should be located near religious artefacts, hospitals and schools. This is a far cry from the accepted attitudes of the total war era – in 1917 Churchill wrote: ‘Any injury which comes to the civil population from the process of attack must be regarded as incidental and inevitable’

opposition, present and future, are learning quickly that high value items should be located near religious artefacts, hospitals and schools. This is a far cry from the accepted attitudes of the total war era – in 1917 Churchill wrote: ‘Any injury which comes to the civil population from the process of attack must be regarded as incidental and inevitable.’⁴¹

Minimising collateral damage has also been a high priority but is now a prime concern within western militaries for different reasons.⁴² The low tolerance of collateral damage accepted by politicians is based on the reaction of the population to what is seen through the global media. International law rightly demands that non-combatants are excluded and protected as much as possible from the effects of military operations. Collateral damage, from a purist military perspective, is undesirable because of the waste of valuable resources and the resultant need to repeat an attack or operation. If your weapons miss the objective and hit a civilian object, by implication, the military target will need to be attacked again – an inefficient use of resources and an unnecessary risk to those personnel who must repeat the mission. So for more than one reason, there is tremendous pressure to not only hit the correct military target, but also to avoid, at considerable effort, the risk of accidentally striking civilian objects. Add to this memories rekindled of Vietnam and of continual ‘hindsight-analysis’, generally out of context, of actions that took place in the Second and First World Wars and you have a robust and enduring intolerance of casualties and collateral damage. That said, there is a fair amount of moral fatigue to contend with – so often is the population exposed to disturbing images that perhaps it is becoming *blasé* and more willing to accept the devaluation of life as a sign of the times.⁴³ Luttwak’s logic appears once more: the military’s desire to show clinical, precision strikes on TV is based on a need to demonstrate that the rules of war are being rigidly applied. Unfortunately, this gives the inexperienced viewer the impression that every attack will ‘go down the air conditioning shaft’ – when weapons go awry, the impact is that much more significant and the intolerance escalates. The military is then further constrained with the weapons it may employ to achieve the aim.

The temptation to use IW techniques will be more and more compelling as the global tolerance of collateral damage continues to reduce. The desire for zero casualties will continue to drive research into Non-lethal Weapons (NLW) that ‘disable and contain rather than kill and pose minimum long term harm, either to combatants or to the environment’.⁴⁴ IW is a logical corollary to this trend, assuming that IW techniques, totally or in part, can be considered non-lethal use of force. The default, “fail-safe” position would seem to be to treat information operations as if they were in fact a use of force.⁴⁵ As Barnett continues, ‘if the case can be made and sustained that particular forms of information operations do not constitute uses of force, they could be very valuable assets for national security. The debates over IW, Category III in particular, being a non-lethal use of force, if a force at all, have yet to be entered in earnest, given the relatively recent acceptance that IW must be taken seriously. Article 42 of the



UN Charter is concerned with the use of force whereas Article 41 deals with measures not involving the use of force (ie sanctions).⁴⁶ Which Article to apply to an IW attack would clearly be an area for significant further work. Indeed, William Church advocates that the next logical step is a comprehensive review of IO weapons and tactics that places them in context of Protocol 1 to the Geneva Convention.⁴⁷ However, it may be that the reactionary nature of International Law means that nothing will be done until a serious attack has taken place:

Chief Justice Oliver Wendell Holmes once wrote, “The life of the law has not been logic; it has been experience.” It seldom happens that a legislature foresees a problem before it arises and puts into place a legislative solution before it is needed. More typically, legislators react to a problem that has already manifested itself. The international legal system operates in the same manner.⁴⁸

There is also a battlefield shift in what are commonly called Peace Support Operations (PSO) or Military operations other than War (MOOTW), military activities below the threshold of conventional war. No longer are battles conducted away from the population in defined arenas that are largely free of non-combatants. Warfare, limited though it is, is increasingly conducted in urban environments. Not only is this highly dangerous to the attacking, ‘peace-enforcing’ force, it is completely unsuitable for the weapon systems that make up a traditional fighting unit. Heavy armour, unguided bombs and missiles can not be effectively employed in urban areas without causing considerable collateral damage. Thus the considerable emphasis placed on urban warfare in the twenty-first century, highlighted by the US Marine Corps’ *Sea Dragon* programme to develop new forms of expeditionary warfare.⁴⁹

The most benign act, in total war context, can resolve or induce a perception that achieves the strategic aims

If interpretations of International Law shape and influence conventional operations, it can be seen that attacks of tactical targets with tactical platforms can have strategic and grand strategic impact, dependent on the conditions at the time. Thus we are in an era of perception management where the targeting process is refocused on achieving strategic effect. The most benign act, in total war context, can resolve or induce a perception that achieves the strategic aims. Perception management therefore offers greater opportunity for alternative applications of force and opens the door for NLW and IW options. However, in considering the use of IW techniques, it is vital to consider the likely response of your adversary. The use of conventional explosive force tends to send a relatively clear message. In the height of crisis management, the induced failure or recognised interference with adversary information systems may have an unpredictable effect on his next move:

The use of information warfare means against Russia or its armed forces will categorically not be considered a non-military phase of a conflict, whether there were casualties or not....considering the possible catastrophic consequences of the use



IW can cause flawed images of each side's intentions and capabilities to be conveyed to the other, with potentially disastrous results

the particular mixture of hardware and software employed by the adversary will respond in the expected way to the IW damage mechanism employed? Most importantly, how, when considering Battle Damage Assessment, 'essential to provide credible and comprehensive analysis to determine the effectiveness of attacks', will the induced effects be identified?⁵² It is hard enough to get an assessment of the damage inflicted with conventional weapons, even with the considerable intelligence collection assets available to the UK. It is therefore likely to be extremely challenging for the British military culture, infatuated with tangible statistics, to measure the strategic effects and consequences of IW.

Precision engagement will be just as important with IW attacks as it is with traditional methods. Just as sanctions are hard to focus, IW campaigns could be difficult to precisely control. Above all in considering the potential for the offensive use of IW, is your adversary's susceptibility. Time after time, conflict after conflict, Western governments and their militaries consider the likely enemy courses of action based on the assumptions and culture inherent in our Western Way of Warfare.⁵³ The UK, more so the

of strategic information warfare means by an enemy, whether on economic or state command and control systems, or on the combat potential of the armed forces....Russia retains the right to use nuclear weapons first against the means and forces of information warfare, and then against the aggressor state itself.⁵⁰

IW can cause flawed images of each side's intentions and capabilities to be conveyed to the other, with potentially disastrous results.⁵¹

In the coercive operations that typify PSO or MOOTW, the strategic objective is to send a clear and unequivocal message to the adversary. Either the state in question meets the demands of the International Community, generally espoused in the form of a UN resolution, or it will continue to suffer the effects of action, increased in intensity to a point when it has no choice but to accept. This is an important change from Strategic Attack to Strategic Effect. In considering the use of IW techniques, it must be certain that Strategic Effect can be induced. Will the source of the IW attack be obvious to the opponent or will the activity be open to hijack by a third actor? What assurances are there that the planned activity will achieve the desired result? Given the shortfalls and extras that already bug COTS software, what assurances are there, if any, that

Unless an adversary depends on interconnected information systems, there is little point attempting to deny or destroy them

US, depends on the creature comforts of capitalism to such a degree that if they were to be interfered with, the results would be significant. Unless an adversary depends on interconnected information systems, there is little point attempting to deny or destroy them.

THE THIRD ELEMENT

There is an unfortunate track record when it comes to technology and its adoption into normal working life. Despite the claims and advice from visionaries, militaries tend to work very hard to adapt new technologies to familiar working practices. A ready acknowledgement of the potential and utility of innovation is often an attempt to avoid revealing the true story – a failure to really understand the implications. For example, in 1870, with their newly developed, rapid firing *mitrailleuse*, the French enjoyed a tremendous potential firepower advantage over the Prussians. Unfortunately, this early version of the machine gun looked more like a field piece instead of a rifle, and it was deployed behind the front with the artillery. Thus, the weapon that would dominate World War I a generation later had almost no effect on the Franco-Prussian conflict.⁵⁴ In contrast, DiNardo and Hughes argue that history has also repeatedly shown that technology is best incorporated in the context of enhancing such methods that have already proven successful.⁵⁵

... ‘information has always been a source of power, but it is now increasingly a source of confusion. In every sphere of modern life, the chronic condition is surfeit of information, poorly integrated or lost somewhere in the system’

More than just technical solutions are needed. ‘A focused and coherent technology strategy’⁵⁶ will indeed be an essential element but it is not the hardware that is the issue – the Vietnam War proved that high technology does not in itself win wars.⁵⁷ Because it is so easy to send information, a bizarre logic is commonly adopted by many users that dictates that everyone must want the information – scattergun or push delivery methods don’t solve problems but do clog inboxes and overload users. As Wilensky once put it, ‘information has always been a source of power, but it is now increasingly a source of confusion. In every sphere of modern life, the chronic condition is surfeit of information, poorly integrated or lost somewhere in the system.’⁵⁸

The success of the first 2 elements of the IW triumvirate has unfortunately resulted in a swing towards information deluge. Control must be regained (assuming it was there in the first place) and thus a key requirement will be an Information Management Strategy (IMS). Until information is treated as a strategic asset in the same way that conventional forces, combat arms training, readiness and everything else that is critical to operations is treated, IW issues



will continue to be addressed in a muddled and confused, *ad hoc* way. Such an IMS must reach across all elements of government and industry, be all embracing, covering every type and classification of information handled, required or produced by defence.⁵⁹ It must emphasize the blurring of traditional boundaries in the levels of warfare, Strategic, Operational and Tactical, and get away from the traditional ‘stove-piping’ of information into operational and non-operational, formal and informal, classified and unclassified. Information must add value to an individual or group, a period of time during which it holds that value, an owner or sponsor who’s task is to ensure that the value remains, otherwise the information must be removed.

Perhaps information itself is not the real issue. A librarian has custody of a large amount of information but cannot, through volume, use that information to create knowledge unless the librarian task is dropped and a more scholarly one adopted. Thinking back to Arquilla and Ronfeldt’s pyramid, they suggest that ‘...an excellent manager with poor information may be able to make some good decisions through intuition; an average manager with quality information will make better decisions consistently’ – the key word being quality.⁶⁰ A knowledgeable manager may be able to make equally good decisions with variable quality and quantity information whereas a wise manager may not need any information at all. There have been many situations in which commanders had virtually all the information possible on enemy strength and dispositions but could not transform it into an understanding of enemy intentions.⁶¹ Selection and Maintenance of the Aim, the cardinal Principle of War,⁶² is hard to achieve when a constant stream of variable quality information can tempt commanders into waiting just a little longer before making a critical decision.

For an IMS will be a stepping stone to a greater goal – knowledge through sharing. Campen tacitly avers the truth, suggested by Sun Tzu 2,500 years ago, that the ultimate goal of the struggle is to dominate the enemy in knowledge, not information.

Collection and analysis of information is, of course, a part, but not the whole.⁶³ By looking after a key ingredient to knowledge, information can be collected, used, disseminated and interpreted to create something that adds value to the core output task of the organization. Collection has never been a problem, indeed it is one of the UK’s strong points – whether the most is gained from that collected information is more doubtful. The orchestration of this process revolves around the adoption of information management as a core responsibility of those in the command chain. At every level, information needs are different and focused to the task in hand. It is suggested that the *baton* be held by a Chief Information Officer who would help lead and direct the organization by ensuring that information is treated strategically. Whilst Art Money, the US Assistant Secretary of Defence for command, control and communications has recently been appointed CIO in the US, such a post has yet to be filled in the UK.

Organizational changes will be harder to adopt. A natural and compulsive hierarchy, the military needs to reap the benefits of networking without losing the structure of the Command Chain, so important to the conduct of military operations in an increasingly complicated and difficult strategic environment. The Joint Battlespace Digitization programme suggests concepts of

an information equipped soldier having data-link, real time updates and control – such potential must be treated carefully. It would be unwise to vest the decision-making material of the military with such a low denominator. Indeed, as Sullivan warns:

Junior infantry...may be connected electronically to sources of awesome firepower....Privates or lance corporals might control more destructive power than an entire army corps possessed in World War II. But would it be wise to entrust such capabilities to nineteen- or twenty-year-olds, however intelligent, well-trained and psychologically stable?⁶⁴

On the other hand, the trend for micro-management through a growing desire for commanders to be in the cockpit or at the head of the platoon must be reversed. So-called ‘forward leadership from the rear’,⁶⁵ four-star generals, senior civil servants and even prime ministers make poor combat pilots or soldiers.⁶⁶ Unfortunately, history is full of examples of this disruption of the command chain, the most memorable being Lyndon Johnson essentially conducting the defence of Khe Sanh from a sand table in the White House.⁶⁷

Networking offers many opportunities for redundancy as many alternate paths exist to information or decision. Such a concept would be unworkable in its own right within traditional military circles. Yet the hierarchy that must exist between the electronic protagonists of government and commerce will strain towards such a solution. What will be key for the military is for it to decide where it can comfortably operate between the opposites of networked organization and organizational networks.

Of prime importance is the way in which the organizational culture change is introduced with the people who interact with the system of systems. For many personnel, military and civilian alike, the concepts surrounding IW are both alien and abstract. Many have grown up outside of the information age in a time when computers were physically enormous, occupying separate departments of large corporations and whose operators spoke another language. Whilst some would say the latter is still true, many find themselves at the command of far more power in a much smaller form resulting in fear, distrust and frustration. To many users, it isn’t as ‘obvious’, as the help desk suggest or as their children demonstrate.

Given that connectivity, when it arrives, will bring a new, greater vulnerability to the UK, it is imperative that defensive mechanisms are put in place as a matter of priority. Defence in Depth must be a principle to adopt. Combinations of physical, technical and procedural security will be needed to build up a robust information assurance core to the collective whole. Probing and testing by ‘Red Teams’ and ‘CERTS’ will be fundamental to any strategy that seeks to exploit and defend against the possibilities and disadvantages of this revolution.⁶⁸ Such Information Assurance mechanisms must not ‘play the blame game’⁶⁹ but must offer constructive criticism and practical remedies – to do otherwise would be to create a ‘PC police’ image that would impair the culture change process.

One of the greatest physical risks to security stems from human nature. Used properly, passwords are a robust mechanism to ensure that access to information systems is restricted to those that need it. If you can remember a mixture of alphanumerics and characters in upper and lower case and then learn a new 'word' every couple of months then all is well. Unfortunately, the average user, left to his or her own devices, will select something a little more memorable, but often predictable. The number of users whose password is 'password' is so widespread that system designers must now start to think like system users and develop passive systems such as biometrics for user identification.

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Technical contributors to defensive IW (Information Assurance in emerging UK doctrine ⁷⁰) include artificial intelligence, neural learning systems such as the IW Attack Assessment System (IWASS) which can be used to evaluate potential threats, provide Indicators and warnings of an IW attack and to predict likely courses of action.⁷¹ Other network software tools are available to monitor proceedings and to look for the unusual. It must be remembered though, that detecting attack will be an increasing part of the training that must be given to users of all levels and variations of military information systems. Detection will be an issue. Screens will not go blank – the data displayed will be subtly manipulated making what is seen plausible but wrong. This interference is all the easier now that, for example, raw radar displays have been replaced by computer generated situation displays, in convincing colour and clarity. Those hard-won skills that, through experience and training, enabled operators to work through electronic interference, are fading fast. Many have become system operators who no longer need the skill of a craftsman to get the required output.

According to an Organisation for Economic Co-operation and Development research paper, *Technology upgrading with Learning Cost – A Solution for Two Productivity Puzzles*, by Sanghoon Ahn, productivity declines initially when technology is introduced because people take time to learn how to use it. Later, however, benefits show through. What happens though, when the rate of change of technology is so great that you never get beyond the downward learning phase and into the upward productive phase?⁷² Less of Moore and more of Ahn would enhance capability by ensuring that users can fully exploit opportunity and effectively resist sabotage.

As far as offensive opportunities are concerned, the systems approach to targeting that has been developed on both sides of the Atlantic since the Gulf War will need to be expanded and refined. If IW techniques, including Computer Network Attack are to be developed and introduced into the repertoire of potential responses, then an intelligence cost can be expected. Whereas the crew of an aircraft dropping an iron bomb can manage to complete the task with rudimentary intelligence, to expect the same of an IW based attack is to court failure. The level of detail that will be required to successfully interfere electronically will



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be significant. But systems analysis pays off and, if approached methodically, is generally worth the effort expended. Every [target] system has its weakness, its Achilles Heel. Whether to use conventional force or IW/IO against this weakness will depend on the situation at the time. That the two options should be closely coordinated cannot be overstated.

CONCLUDING THOUGHTS

History gives us no clear definition of what constitutes an RMA but emphasises that an RMA is not a precise phenomenon that has a clear start and end point or indeed, can be recognised as

happening without the need for historical analysis.⁷³ So has there been a Revolution in Military Affairs? As yet, the sort of dramatic shift that typified the industrial revolution has just not materialized. There is certainly rapid change but this is much more evolutionary in nature. The biggest change in the conduct of future military operations is likely to come not from the weapons alone but from the application of information technology to military command and control.

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The Third Element must be developed to bring together Technology and Infrastructure in an orchestration of capability. A thorough understanding coupled with willingness for organizational change must be underpinned by a doctrine that illuminates and educates. Government and military must tackle the more intangible Category III IW, from Netwar to Cyberwar. It may be anathema to employ hackers and crackers but if they have a monopoly in the skill set then there appears to be little alternative.



The UK certainly believes that radically improved capabilities in the field of information processing and communications systems will increase situational awareness by combining information from all available sources and rapidly distributing it to those who need it, thus permitting more effective and efficient use of our forces.⁷⁴ Smart long-range precision weapons will enable us to attack targets accurately from distance, thereby reducing our own and civilian casualties.⁷⁵ But this capability enhancement currently has the hallmarks of a Military Technical Revolution and is not a panacea; it is merely an additional option for use in specific circumstances against an adversary susceptible to its damage mechanisms. Offensive opportunities, sensitive as they are, should be properly resourced and offered up to the political leadership as a potential alternative course of action.

The first element of the triumvirate of IW, information technology, has been evolving since the seventies and the second, the Internet or World Wide Web, once a critical mass of users were attracted, has been growing exponentially. Both have been rapid by any standard but, nevertheless, evolutionary. Journalists and documentary makers across the World extol the wonders of IW, dipping freely into the rich pool of Toffler catch-phrases with remarkably uncritical abandon.⁷⁶ But much work remains to be done, both in definitional terms, in international relationships and doctrine, not to mention national issues such as policy lead, requirements and potential impact on the way that the UK Ministry of Defence conducts its business in the arena of IW. If it is to avoid being left behind, the UK must learn from this confusion, sidestep time-wasting at the boundaries and contribute to the debate by offering clarity of thought in ‘a holistic assessment of national vulnerabilities’ and a measured analysis of the opportunities.⁷⁷

Information can only be an object of warfare when its value, to both sides, is understood. Without a top-level strategy on Information Management, any resulting doctrine and order will be the result of good fortune rather than good planning. If IW is to be another ‘club’ in the golf bag of statehood, then considerable effort must be put into the development of coherent doctrine – we must learn how to play with this new club. An understanding of the relationship between the Information Age and national security should be high on the agenda of any nation wanting to exploit the offensive opportunities of IW and ensure that it can defend itself against emerging threats. As Libicki suggests, ‘[US] vulnerability is greater than it ought to be but should not be exaggerated’ – while the UK is not yet as exposed, it is only a matter of time. That time should be used to develop a robust and coherent Third Element by learning how to disseminate, protect and exploit information shared between the UK’s military, government, industry and the society they all serve. Having achieved such a considerable task, the interoperability issues between NATO and potential coalition partners need to be addressed. If understood correctly, IW would lose its sex appeal or media attention and it would disappear from Presidential Decision Documents and grand national strategy – but it would grow up and go to work.⁷⁸ Perhaps then it will be possible for information to be a weapon of war. Moreover, it may take the ascendancy of the information generation to the height of both military and civilian office before the real potential of IW can be realized and a complete culture change enabled. Whether a revolution takes place or not will be up to future historians to debate – the seeds have certainly been sown.

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The **Forgotten Aviators:**

The British Contribution To
United Nations Air Power
During The Korean War
1950-1953

“My number 2 said “MiGs at 12 o’clock” so I looked and there were 8 MiGs. I think they were experienced pilots. They were about 250 mph faster than us and they were making an attack on us and then pulling straight up and then coming back. Then they got fed up with this, the 4 that I had, and one of them decided to make an attack on me. That was his fatal mistake because I could turn so much quicker than he could, and at low-level he had reduced his speed to get near me. And so in no time at all, I had got behind him and I fired until he went down and hit the ground.”

These opening words by Peter ‘Hoagy’ Carmichael were taken from an interview with Max Hastings for the television programme ‘The War in Korea’ in 1988, when he was describing a very historic day for the Fleet Air Arm. On 9 August 1952 Lieutenant Peter Carmichael RN was leading a formation of 4 Sea Fury aircraft of 802 Squadron operating from HMS Ocean when they encountered 8 Communist MiG-15 aircraft. In the ensuing 5 minute dog-fight one MiG-15 was destroyed and 2 others badly damaged; this truly remarkable feat was achieved without a scratch to the Sea Furies. Indeed, to Lieutenant Carmichael had fallen the unique distinction of being the only piston-engined aircraft pilot to shoot down a jet-engined aircraft, a formidable testimony to the Sea Fury’s ruggedness and its excellent dog-fighting characteristics. But this is just one account of the many British airmen of the Fleet Air Arm, Royal Air Force and Army Air Corps who flew in the Korean War between 1950 and 1953 – are they the ‘Forgotten Aviators’?





On 25 June 1950 North Korean forces crossed the 38th Parallel and invaded South Korea. In response to a Security Council recommendation that the United Nations should provide assistance to repel the invasion, 16 nations, including the United States of America and the United Kingdom, came to the aid of the Republic of Korea. A unified command under the leadership of the United States was established on 8 July 1950. This sudden and unexpected involvement in a limited war in a distant corner of the globe created many difficulties for the United Kingdom. British armed forces had been steadily and rapidly run down since the end of World War II and a new mobilisation was most unwelcome, both politically and economically. Nevertheless, a limited mobilisation was required if a worthwhile contribution was to be made to operations in Korea. The British Army was heavily committed in Malaya and elsewhere at that time and found great difficulty in raising a force to support this new emergency. However, a number of British brigades were formed during the first few months and these were subsequently combined into the 1st Commonwealth Division on 28 July 1951. The Royal Air Force was also very heavily committed to the Malayan Emergency and its overall contribution to resolving the new conflict in Korea was perforce limited. There were other reasons why the Royal Air Force did not send a larger air component to Korea and these will be outlined later in the paper. The Royal Navy could play only a limited role in the Malayan Emergency in view of that country's mainly landlocked nature, and was therefore able to provide a number of ships, including aircraft-carriers, to the United Nations coalition in Korea.

The long and bloody battles of the Korean War were to last until 2200 hours on 27 July 1953 when a cease-fire came into effect between the Chinese-backed North Korean forces and the United Nations Command. Many books and articles have been written on most aspects of the Korean War in the intervening years, some of which are detailed in the bibliography at the end of this paper. However, few accounts have been produced on the role of British air power in the Korean War. In an attempt to record some of the more important events, this article will outline the contribution made by the Fleet Air Arm, Royal Air Force and Army Air Corps to the overall war effort.

SEA FURIES, FIREFLIES AND SEAFIRES

United States, British and Commonwealth aircraft-carriers were active throughout the Korean War. The air power contribution from the Royal Navy was not insignificant, with HMS Triumph on active service from July to September 1950 and HMS Theseus from October 1950 to April 1951. Two other British aircraft-carriers saw extensive action, with HMS Glory undertaking 3 separate periods of active service between April 1951 and May 1953 and HMS Ocean involved in operations for 2 periods between May 1952 and July 1953. In all, 10 Fleet Air Arm squadrons were involved in combat air operations of various types, flying such aircraft as the Supermarine Seafire, Hawker Sea Fury and Fairey Firefly. A Westland Dragonfly helicopter was also embarked on a number of carriers for utility and search and rescue roles. The Vickers-Supermarine Sea Otter amphibian was

still in service at the time and flew from HMS Triumph and HMS Theseus, again in the search and rescue and communications roles. Participation in the Korean War provided the Royal Navy, and in particular its aircraft-carrier force, with a timely reminder of the realities of modern warfare.¹ Their performances were admitted on all sides to be outstanding, but this was rendered possible only by the virtual absence of enemy air activity. Had there been opposition on an appreciable scale, so much effort would have been required for fighter defence of the carriers that offensive operations would have been severely curtailed. The combat operations that did take place were achieved through extremely hard work, much improvisation and the acceptance of calculated risks. At times the weather conditions, especially during the winter months, were atrocious. Flying accidents were not uncommon and aircraft serviceability rates fluctuated markedly throughout the campaign. As witnessed by Lieutenant William Jacob RN, a Firefly pilot with 812 Squadron and later with 825 Squadron, carrier operations could be unpredictable and unforgiving:

*"We flew from dawn to dusk every day and by my recollection we flew about 70 sorties a day with a complement of about 24 aeroplanes. We did lose a lot of people, either because they were shot down or because they had some defect with the aeroplane. The aeroplanes were much less sophisticated than they are now and were not anything like as reliable. One particular person I remember, his aeroplane wheels and hook wouldn't come down, so he had to ditch beside the carrier. We all watched him, and he never got out, we never saw him again, despite the fact that a rescue helicopter was airborne and the carrier was only 200 or 300 yards away."*²



In all, 10 Fleet Air Arm squadrons were involved in combat air operations of various types, flying such aircraft as the Supermarine Seafire, Hawker Sea Fury and Fairey Firefly



...catapulting arrangements for the Firefly required so much preparation as to make its launching by this means scarcely worthwhile ...

Fleet Air Arm aircraft were used in a wide range of air power roles and missions. They flew sorties in what we now term air interdiction, close air support, tactical air reconnaissance, airfield attack and fighter escort. This was a remarkable achievement with obsolete aircraft such as the Firefly and Seafire. The Royal Navy also

had other problems with which to contend. Some ships were undermanned and ill-equipped or supplied for the many and wide ranging tasks to which they were to be committed. For example, catapulting arrangements for the Firefly required so much preparation as to make its launching by this means scarcely worthwhile. In a report dated 2 – 5 July 1950 the captain of HMS Triumph went on to state:

*'Very little Firefly I catapulting has been done because the catapult is always required for launching the Seafire 47. It takes 2 hours to fit the legs to the trolley for launching the Firefly I, their catapulting rate is slow and the catapult is then useless to the Seafire until converted back again.'*³

A wind speed of 34 knots over the deck was needed to launch Fireflies with 500 lb bombs, but if there was only a light breeze, Triumph's engines could not bring her up to that speed. At that time the Seafire 47 was not fitted with bomb racks, and therefore the only armament available on the aircraft was the air defence cannon and air-to-ground rockets. This did not give many options to those planning air operations or the aircrews involved. Among aircraft and warships alike there were

...the Royal Navy component of the United Nations maritime force was inclined to look admiringly at the advanced systems of their United States counterparts, notably in the much larger fleet carrier the USS Valley Forge.

communications problems due to obsolescent equipment, requiring high maintenance or, where new radios had arrived, a want of maintenance manuals.⁴ The vast majority of these problems arose from the deployment of a fleet underfunded and over committed. Most of the British aircraft-carriers involved in the Korean War were Colossus Class light fleet carriers, and therefore the Royal Navy component of the United Nations maritime force was inclined to look admiringly at the advanced systems of their United States counterparts, notably in the much larger fleet carrier the USS Valley Forge. This modern carrier could operate up to 100 aircraft with a mixed complement of Corsairs, Skyraiders and Panthers, plus 14 helicopters. In contrast, the British carriers usually operated with approximately 25 fixed-wing aircraft.

During the Korean War, the various air forces flying in support of the United Nations did not come under a unified command and control system. The airspace management procedures were either non-existent or very rudimentary. This lack of a central air tasking agency led to confusion between friendly air forces; for example, Fleet Air Arm pilots operating from aircraft-carriers had no real idea of what the other air arms such as the Royal Air Force, United States Air Force and United States Navy were tasked to fly from one day to the next. This far from ideal state of affairs could always lead to 'friendly fire' or 'blue on blue' incidents, and the inevitable occurred very early on in the war. On 28 July 1950 HMS Triumph and HMS Comus were sailing off the east coast of Korea when a flight of Seafires from 800 Squadron was launched to investigate an unknown radar contact which turned out to be several B-29 Super Fortress aircraft flying in formation. Commissioned Pilot D R White, who was flying as number 3 in his Seafire, passed one of the American aircraft at a range of approximately 300 yards when, for no apparent reason, it opened fire on him and the first burst of machine-gun fire hit his aircraft in the rear fuel tank. Commissioned Pilot White immediately rolled his aircraft onto its back and baled out. Unfortunately, the sea was too rough to launch the search and rescue Sea Otter from HMS Triumph but he was picked up by the United States Navy destroyer Eversole after about an hour in





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the water. He was found to be suffering from burns to his face, arms and shoulders, but his condition otherwise appeared to be satisfactory.⁵

The Super Fortress aircraft were from the 22nd Bombardment Group and on this day were flying towards their main target, the Seoul marshalling yards. On numerous occasions earlier in the month the B-29s had been intercepted by North Korean Air Force Yak aircraft. Indeed, a 19th Group B-29 had been shot down by Yaks on 12 July. Prior to the unfortunate incident on 28 July, the 22nd Bombardment Group commander had instructed his gunners to fire at any unidentified fighters within range which pointed its nose at one of the bombers.⁶ All the pieces were in place for a 'blue on blue' incident. When 4 unidentified aircraft suddenly broke out of rain clouds and headed toward the tail of a 22nd Group B-29, first the tail gunner and then the central fire-control gunner blazed away at them. All members of the bomber crew who saw the unknown plane identified it as a Yak, but it was the Seafire piloted by the unlucky White. However, when viewed at certain angles, the Seafire and Yak did not look too dissimilar.

Three days later, HMS Triumph secured alongside in the port of Kure and underwent a short period of self-refit and aircraft maintenance. During this time a signal was received from Lieutenant General George E Stratemeyer, United States Air Force, Commander Far East Air Forces, expressing regret for the incident on 28 July, but also suggesting that all aircraft should keep out of gun range of the B-29s.⁷ The actual text of the signal was drafted the day after the incident and is reproduced below.

MESSAGE TO COMNAVFE. INFO COPIES TO CINCFE, COM 7TH FLEET, CG BOMBCOM.

REQUEST YOU PASS FOLLOWING MESSAGE TO ROYAL NAVY:

SINCERELY REGRET INSTANCE SEAFIRE AIRCRAFT APPARENTLY FIRED UPON BY OUR B-29S AND ONE SEAFIRE WAS SET AFIRE. HAPPY THAT PILOT WAS RESCUED. ACTION UNDER WAY TO REVISE ELECTRONIC RECOGNITIONS PROCEDURES TO PRECLUDE FUTURE UNFORTUNATE INSTANCES. HOPE YOU WILL INSTRUCT ROYAL NAVY PILOTS TO REMAIN OUTSIDE OF .50-CALIBRE MACHINE GUN RANGE WHEN ATTEMPTING TO IDENTIFY, PRIOR TO AN ATTACK, FOUR-ENGINE AIRCRAFT. SIGNED STRATEMEYER.



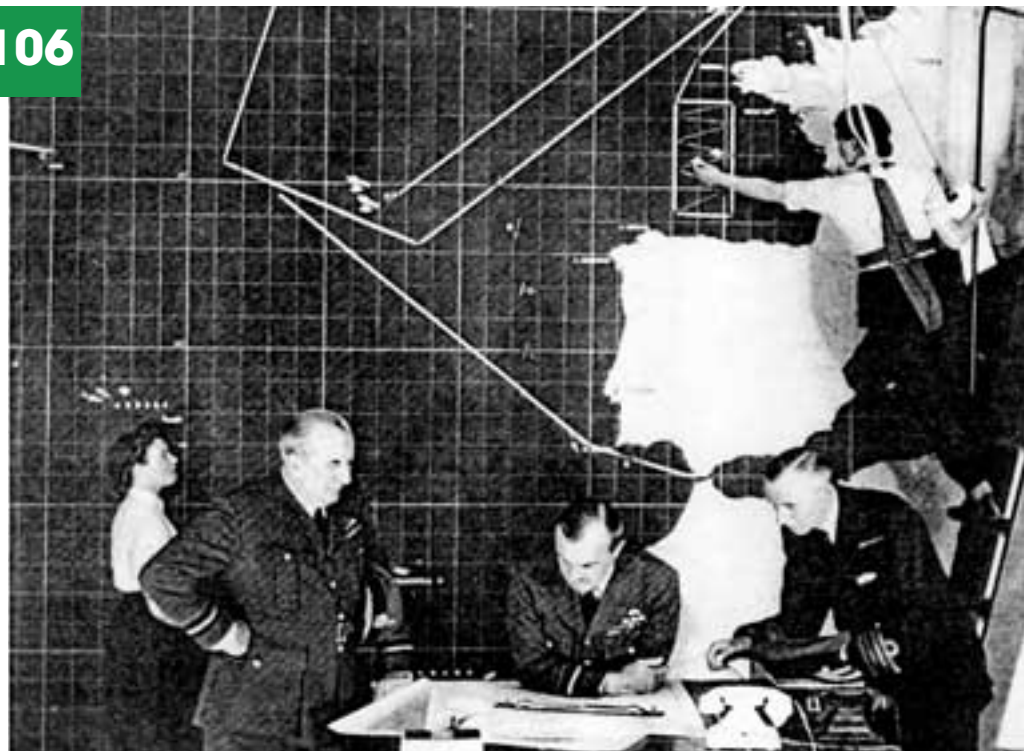
Decorations for distinguished services against the enemy were awarded to 165 officers and men of the Royal Navy and a further 289 were mentioned in dispatches

The highest proportion of operations flown by Fleet Air Arm aircraft were close air support or air interdiction missions. Some of the combat statistics achieved by the Fleet Air Arm during the Korean War were remarkable. For example, approximately 15,200 bombs of varying weights were delivered on and around various targets. Also, 57,600 three-inch rocket projectiles and over three million rounds of ammunition were fired from aircraft during the campaign. But sadly, 26 Fleet Air Arm aircrew lost their lives on operations. One Royal Air Force navigator, a flight lieutenant attached to 810 Squadron, HMS Theseus, was killed on 13 March 1951 when his Firefly aircraft crashed a few miles away from a bridge near Sariwon.

The crash was due either to having been hit by anti-aircraft fire or to damage sustained from bomb burst fragments; the Fleet Air Arm pilot was also lost. A further 7 Royal Navy aircrew were killed in flying accidents. Considering that the 10 squadrons involved flew nearly 23,000 operational sorties, these losses were mercifully light.⁸ Decorations for distinguished services against the enemy were awarded to 165 officers and men of the Royal Navy and a further 289 were mentioned in dispatches. An important aspect of the British naval air power effort lay in the fine morale maintained throughout the war. Despite long periods at sea, the drudgery of patrols and the very hazardous missions flown during the tropical heat of the summers and the extreme cold in the winters, the morale of the aircrew and ships' companies never wavered or flagged.

SUNDERLANDS, METEORS AND SABRES

As outlined earlier, the start of the war in Korea could not have come at a more difficult time for the Royal Air Force. The emergency in Malaya was at its height and the Service was suffering from what we now term 'overstretch'. In 1950 Air Chief Marshal Sir John Slessor was Chief of the Air Staff, and he and the other Chiefs of Staff saw countering the Russian threat in Europe as their main effort. Of paramount importance was establishing the NATO military structure in Europe and strengthening the forces available to the Alliance. The Royal Air Force was seen as central to this process and it was inconceivable that it should be weakened by sending combat squadrons to the Korean theatre of operations.⁹ There was, however, one way in which the Royal Air Force could immediately assist. With the initial Communist drive in Korea taking them rapidly southwards to Pusan, it was clear that the land forces would need the support of maritime aircraft to blockade the enemy's supply ports. At the time of the invasion, the Sunderlands of 88 Squadron from Hong Kong were exercising with Royal Navy and United States Navy ships in the Sea of Japan. The Sunderlands at once became involved in the conflict and were soon joined by more Sunderlands from 205 Squadron and 209 Squadron from Singapore. The Sunderlands were located at the ex-Japanese naval air base of Iwakuni in Japan, about 100 miles from the southern coast of Korea. Although the Sunderlands had other duties over the waters around Malaya, their roles were not as closely connected to the internal security operations as those of the



In 1950 Air Chief Marshal Sir John Slessor was Chief of the Air Staff, and he and the other Chiefs of Staff saw countering the Russian threat in Europe as their main effort

local land-based squadrons and some of the aircraft could be spared. Consequently, a pattern emerged whereby each of the 3 Sunderland squadrons spent a month at Iwakuni in turn and this continued for the rest of the war.¹⁰

For Air Chief Marshal Sir John Slessor the immediate difficulty in the Korean commitment was not a lack of combat aircraft and war supplies but an almost critical shortage of manpower. On 21 July 1950 he wrote a minute to Sir Harold Parker, Permanent Secretary, Ministry of Defence:

'You asked me to let you have for the Minister's information a short note on personnel requirements. The first point to realise is that the RAF today is

*some 20,000 men short of establishments. These establishments are not lavish for our present commitments. We quite definitely have not got any 'fat' on the Air Force – we had two years ago but it has all been sweated off. Within that problem is the more important one of the unbalance of trades and the very serious shortage in some of the really key trades without which the others cannot keep aircraft in the air....for instance, in January this year Wireless Fitters were only 50% of establishment, as were Radar Fitters (air); Electricians about 60% of establishment and Ground Wireless Mechanics 65%...'*¹¹

The Chief of the Air Staff went on to state that:

*'We must retain a far higher proportion of regulars now due for discharge and the RAF can only meet its minimum foreseeable commitments if the term of National Service is increased to 2 years.'*¹²

These and similar comments from the other Chiefs of Staff stimulated much debate within the Cabinet. High on the agenda for Cabinet meetings during this period was a proposal to increase pay for the armed forces, but it also became evident that they must first decide whether the length for national service was to be increased. For example, an extension of 6 months would add 80,000 men to the strength of the Army and the Royal Air Force. During the latter part of August 1950 it was finally decided that the length of national service would be increased and an additional £56 million would be made available for pay. In broad terms, the planned increase of 28,000 men for the Royal Air Force would fill ground crew vacancies and permit flying training for national servicemen. It was hoped that these changes would improve the overall combat effectiveness of the Royal

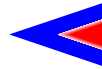


The Sunderlands of 88, 205 and 209 Squadrons formed the Far East Flying Boat Wing which participated fully throughout the 3 years of war. These aircraft were integrated at Iwakuni with patrol squadrons of the United States Navy...

a day-to-day basis, operational control was exercised from a United States Navy flying boat depot ship moored in Iwakuni Bay. The ship also controlled the United States Navy Mariner flying boat squadrons based at Iwakuni and these aircraft operated in a similar role to the Sunderlands. A common flying programme was developed and the patrols flown by the British and American aircraft were very closely coordinated. The blockade of the North Korean ports was the principal task; however, the Sunderlands also flew convoy protection patrols in support of the United Nation maritime forces. There was a threat to friendly shipping from North Korean surface vessels and mines, and the Sunderland crews depended upon a temperamental surface surveillance radar and the 'Mark One eyeball' when hunting enemy ships.

Air Force; however, they did not result in the Service sending close air support, fighter or bomber squadrons to Korea.

The Sunderlands of 88, 205 and 209 Squadrons formed the Far East Flying Boat Wing which participated fully throughout the 3 years of war. These aircraft were integrated at Iwakuni with patrol squadrons of the United States Navy, and their role was to maintain the blockade of Korean ports. To achieve these missions the Sunderlands came under the operational command and control of the United States Navy from their base at Sasebo. On



The tasking was onerous. The patrols were often of 12 hours duration, the weather was usually unkind and the aircraft were unheated and very draughty. Temperatures in the region of minus 20 Celsius were not uncommon and airframe icing was a frequent hazard.¹³ The blockade of ports held by the North Koreans had to be maintained around the clock and night flying proved to be even more demanding. The Sunderlands also had to carry out weather reconnaissance which was usually flown at night over the Yellow Sea and the Sea of Japan. Sea level pressure readings were required for more accurate weather forecasting and the crews operated at very low level at night using a rather unreliable radio altimeter. This was a risky enterprise in good weather and downright dangerous when flying in cloud. Nevertheless, there were no reported accidents and the meteorological data obtained by the aircrews was passed by radio to ships in the area and back to the shore-based controlling authority. The information was then used to assist in the planning of air operations throughout the Korean theatre.

The flying rates achieved by the Sunderlands are worthy of note. More than 1,100 missions were flown by the 3 squadrons, amounting to 12,500 flying hours

The flying rates achieved by the Sunderlands are worthy of note. More than 1,100 missions were flown by the 3 squadrons, amounting to 12,500 flying hours. This meant that each crew flew between 60 and 70 sorties. This equates to about 7 sorties per month during the period of each crew's attachment, with many individual aircrew members achieving 2,000 hours of demanding flying during their tour with the Wing.¹⁴ No Sunderlands were lost from enemy action and, as far as is known, no enemy aircraft were shot down by them. For their exceptional service throughout the war in Korea, one Order of the British Empire, 25 Distinguished Flying Crosses and Distinguished Flying Medals and many Mentions In Despatches were awarded to personnel of the Far East Flying Boat Wing. However, one aircraft was lost, with all 14 men on board being killed, when it crashed on Formosa (Taiwan) while on a ferry flight back to Seletar via Hong Kong. One aircraft crashed on landing at night at Iwakuni in bad weather with the loss of 4 crewmen and another aircraft was destroyed by very severe weather conditions at Iwakuni when, due to unserviceability, it was unable to depart before a typhoon hit the area.¹⁵

Tragic circumstances surrounded the loss of the 205 Squadron Sunderland which crashed on Formosa. The explanation given at the time of the accident was that the aircraft was some 60 miles off its planned track, at night and possibly in deteriorating weather conditions. A navigational error may have set in during the process of changing from one aeronautical chart to another. A contributory factor, it was thought, was the absence of a radar on board. The aircraft had been stripped of its serviceable radar set before departure, along with other components which were required back at Iwakuni to keep the other Sunderlands fully operational. The supply of spare parts from the main operating base at Seletar, Singapore to Iwakuni was often inadequate and the practice of 'robbing' parts from an aircraft due to return home was not uncommon. The chain of events leading up to this unfortunate accident seem to have a recurring theme: an on-board system unserviceable or missing, as in this case, and a

navigational error at night in poor weather with the aircraft approaching the coast or high ground. Too many aircraft have been lost in this way over the years.

Another formal Royal Air Force contribution to air power in the Korean War was the loan of pilots to 77 Squadron, Royal Australian Air Force, and to the 4th and 51st Fighter Intercept Wings of the United States Air Force.

“ALL I WANT FOR CHRISTMAS ARE MY WINGS SWEEPED BACK”

At the outbreak of the Korean War, 77 Fighter Squadron, equipped with the P-51 Mustang, was Australia’s remaining contribution to the Allied air forces left in Japan after the end of World War II. Squadron personnel were actively celebrating their imminent return to Australia when Communist North Korean forces invaded South Korea. The Australians were soon engaged on air operations and found themselves at war, flying obsolete aircraft. Many close air support and escort missions were flown from Iwakuni, until the Squadron moved to Korea in October 1950. The situation in Korea required that 77 Squadron be re-equipped with a modern jet fighter as a matter of urgency. There is no doubt that the Mustang was a superb aircraft for the role in which 77 Squadron flew it during the first months of the Korean conflict. But with the advent of the Soviet MiG-15 during November 1950, it was obvious that the superior performance of that aircraft could make further operations by piston-engine fighters in Korea fraught with danger, if not suicidal.¹⁶ The replacement aircraft for 77 Squadron had to be readily available and capable of being put into service with the least possible delay. On 6 December 1950 it was announced that 36 Gloster Meteor F Mk 8 fighters and 4 Meteor T Mk 7 twin-seat trainers would be purchased by the Australian Government, with delivery of the first 12 aircraft within 3 to 4 months. No doubt the Gloster aircraft salesmen were helped by the fact that the Meteor was standard equipment for Royal Air Force Fighter Command at that time!

The Meteor was sold to the Australians as a fighter-interceptor aircraft (its role in the Royal Air Force) and 3 Royal Air Force officers and one non-commissioned officer pilot were detached to 77 Squadron to help convert the Australian aircrew to the



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new jet. Interestingly, no Australian pilots were sent to the United Kingdom for training, as it was decided that 77 Squadron would use the Royal Air Force pilots as instructors. However, a 13 strong team of Royal Australian Air Force technicians was sent to the Gloster factory for training on the Meteor. By 24 February 1951, 15 Meteor F Mk 8 and 2 T Mk 7 aircraft were shipped to Iwakuni in Japan as deck cargo on a Royal Navy Light Fleet Carrier and formal training on the new aircraft started on 11 April 1951.¹⁷ At the end of June 1951 Squadron Leader Dick Cresswell, Commanding Officer 77 Squadron, wrote in his monthly report:

*'The squadron has completed almost three months of conversion training onto Meteor aircraft and I can say confidently that the pilots are now ready to take these aircraft into combat.'*¹⁸

It took approximately 8 months for the Royal Australian Air Force to select a new aircraft, accept delivery and train the pilots to combat-ready status, a truly remarkable achievement which would be impossible to emulate in the 21st Century. Towards the end of July 1951, 77 Squadron moved to a new location at Kimpo air base in South Korea and on 29 July 1951, 16 Meteors flew the Royal Australian Air Force's first jet fighter combat mission. The Meteor was tasked in the interception role and the first missions were invariably fighter sweep or combat air patrols.

It was soon found that in air-to-air combat the swept-wing Communist MiG-15 aircraft out performed the Meteors. Having had one aircraft shot down and 2 others damaged by MiG-15s on 29 July 1951, it was decided that 77 Squadron would be employed in a different role. During September 1951 the Squadron commenced its new role flying bomber escort and airfield defence sorties, a duty the pilots loathed. But it was painfully obvious that even in this role the Meteors were no match for the MiG-15s, and after losing 3 aircraft in one engagement on 1 December 1951 the Squadron was switched to duties where MiGs were unlikely to be encountered. Again, this decision was extremely unpopular with the aircrew and a more aggressive role was

keenly sought. After some improvisation the Meteors were used in the ground attack role, with United States Air Force F-86 Sabres coordinating their operations to provide protection from any marauding MiGs. At that time, a popular song on the Australian squadron was “All I want for Christmas are my wings swept back”.¹⁹

The recurring theme of 77 Squadron’s operations over Korea was deficiency in pilot numbers. However, in April 1952 final approval was obtained for the Royal Air Force to despatch Meteor pilots for service with 77 Squadron. It was planned that 4 Royal Air Force pilots would be attached to the Australian squadron during each alternate month, commencing during September 1952. In effect, 5 pilots arrived at Kimpo air base during each of the months of September, October and November to play their role in the conflict.²⁰ By the end of the Korean War, 29 Royal Air Force officers had served with 77 Squadron. The experience was not wasted for one of them, Flying Officer Keith Williamson, subsequently became the Chief of the Air Staff, and eventually several others also reached very high rank. In total, 4 Distinguished Flying Crosses and 6 Mentions in Despatches were awarded to Royal Air Force pilots flying with the Royal Australian Air Force, but 5 pilots lost their lives in combat. Flying Officer M O Berg RAF was shot down by anti-aircraft fire on 27 August 1952 and had to eject from his Meteor. He evaded capture by North Korean and Chinese ground forces for 8 days before becoming a prisoner of war. He was released on 1 September 1953.

“ROYAL AIR FORCE PILOTS IN MIG ALLEY!”

The assistance which the United States Air Force most desired during the early stages of the war was advice and guidance from the Royal Air Force on tactical operations, and particularly in night intruder tactics. Two highly decorated and experienced Royal Air Force officers, Wing Commander P G Wykeham-Barnes (later Air Marshal Sir Peter Wykeham) and Wing Commander J E Johnson (later Air Vice-Marshal Johnson) were therefore attached to the 5th United States Tactical Air Force. Both went to Korea in the closing months of 1950, where the Americans gave them every opportunity to see what was going on and allowed them to fly a number of operational sorties. The reports they produced were critical of the way in which a number of air operations were being planned and executed.

Firstly, it was their contention that air superiority, which had been quickly won at the start of the war, was now being taken for granted. Secondly, air power was being widely regarded as meaning merely close air support for the land forces. Finally, the important principles of air interdiction had not been fully understood at the start of the war. Wing Commander Johnson went on to state:

‘One of the fundamental lessons is that at the outbreak of hostilities both the Air Force and Army units were quite unprepared to participate in joint air-ground operations. The other is that the basic doctrine laid down at the end of World War II for air-ground operations is still valid.’²¹

It seemed that many of the crucial lessons learnt by the Allies about tactical air operations and air-ground cooperation at the end of the World War II had been overlooked or forgotten. It was also another example of individual armed forces believing they could win a war on their own.

Wing Commander Wykeham-Barnes used his night intruder experience to good effect. He flew many missions with the Americans and found that a lack of coordination between the different types of aircraft being used in this role was failing to produce the best results. He went on to produce a new plan for night intruder operations in which squadrons were allocated specific target areas to avoid interference with one another. Furthermore, he proposed a technique using flares for identification of targets and helped to develop a much improved air-to-ground communications system. Without doubt, these 2 highly experienced Royal Air Force officers established a very close working relationship with the United States Air Force and they opened the way for more British pilots to be accepted by the Americans.

Another senior Royal Air Force officer played a prominent part in consolidating Anglo-American relationships during the early part of the Korean conflict. Air Vice-Marshal C H Bouchier was appointed to General MacArthur's Headquarters as Senior Military Liaison Officer between General MacArthur (as Commander-in-Chief of the United Nations forces operating in support of South Korea) and the British Chiefs of Staff. Air Vice-Marshal Bouchier, as the senior Royal Air Force representative in Japan, made detailed arrangements within the Korean theatre of operations for British pilots to fly in combat with the United States Air Force. However, it was the Chief of the Air Staff writing personally to General Vandenberg, the Chief of Staff of the United States Air Force, proposing that Royal Air Force pilots should fly with the American F-86 Sabre squadrons, which really triggered this important British contribution to the air war in Korea.

...a new training system was soon introduced which entailed sending the British crews to Nellis Air Force base in America for conversion to the F-86 Sabre before being posted to one of the Fighter Intercept Wings in Korea



Carefully selected Royal Air Force pilots from the Central Fighter Establishment at West Raynham were among the first to be sent to the American fighter squadrons in Korea. However, a new training system was soon introduced which entailed sending the British crews to Nellis Air Force base in America for conversion to the F-86 Sabre before

being posted to one of the Fighter Intercept Wings in Korea. One of the pilots to follow this route to air combat operations was Flight Lieutenant John Nicholls (Later Air Marshal Sir John Nicholls):

“On 28 June 1952 I did my first operational sortie, which was a fighter sweep out. We didn’t see a thing. The area for operations for the Sabres was mostly what became known in press jargon as MiG Alley, a sort of quarter-circle shape bordered on the north by the Yalu River up to the areas of the dam, about a hundred or so miles in from the Yellow Sea, and then in a sweep down to the south-west to Pyongyang, the North Korean capital. It was in that area, initially, that most MiGs were found...”²²

Approximately 2 months later John Nicholls was credited with 2 MiGs damaged in a single sortie and went on to be credited with 2 MiGs destroyed and a total of 3 damaged. He was subsequently awarded the Distinguished Flying Cross. He flew his hundredth combat mission in the F-86 Sabre on 9 December 1952, and having completed a full operational tour left Korea for the United Kingdom the next morning. By the end of the war, 21 Royal Air Force pilots had served with the 4th and 51st Fighter Intercept Wings. These officers distinguished themselves and made a significant contribution to air combat operations, and a number were awarded both British and American decorations. In total, 3 pilots were awarded the Distinguished Flying Cross. Sadly, 4 Royal Air Force officers lost their lives whilst serving with the United States Air Force.

AUSTERS, BIRD DOGS AND MOSQUITOES

Of all the aircraft types operated by the United Nations in Korea, the most hated and feared – if the statements of captured enemy soldiers were to be believed – were the ‘Mosquitoes’, the T-6, L-17, L-19 and L-20 tactical control aircraft flown in support of the American ground forces. Used for battlefield reconnaissance and artillery spotting, the sudden appearance of one of these aircraft, popping up briefly from behind some feature of the terrain, was invariably the prelude to an air strike or artillery bombardment. The Communist ground forces went to great lengths to shoot down these small, slow and very vulnerable aircraft. During the spring of 1951, having observed the effectiveness of the ‘Mosquitoes’ at first hand, the British Commonwealth Division in Korea made repeated requests for the establishment of its own observation aircraft units. The first of these, 1913 Light Liaison Flight, was formed at Middle Wallop in June 1951 with Auster AOP 6 aircraft and shipped to Korea. The second unit, 1903 Independent Air Observation Post Flight, was taken from the relatively relaxed atmosphere of Hong Kong and sent to airstrips in the Commonwealth Division’s area. Although Royal Air Force units (the only ones to operate from Korean soil), the 2 Flights were manned with British Army pilots and the Auster aircraft were serviced by Royal Air Force and Army ground personnel in roughly equal numbers.

Although 1913 Flight’s main task was liaison, its Austers undertook visual reconnaissance missions from the moment they arrived in Korea. The Flight also possessed one Cessna L-19 ‘Bird Dog’ on loan from the American 8th Army and the British pilots pronounced the L-19 superior to the Auster in most respects. The principal role of 1903 Flight was counter



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bombardment, which involved locating enemy gun positions and assisting friendly artillery to engage them. The pilots also reported on enemy ground activity and carried out photographic reconnaissance. A daily average of 7 sorties was flown, with each pilot putting in about 45 hours flying each month.²³ In spite of the vulnerability of these fragile little aircraft, casualties were relatively light. Nevertheless, 2 aircraft were shot down with the loss of their pilots and one leading aircraftman was drowned when an Auster in which he was flying as an observer crashed into the Imjin River on 12 May 1953. No less than 2,935 Air Observation Post sorties were flown during the campaign and it must be remembered that there were never more, and usually less than 10 aircraft available to the 2 Flights.²⁴

The only other British aircraft to be involved in the war were the transport aircraft of the Royal Air Force. These aircraft, principally the Hastings, helped to provide the essential supply links between Singapore, Hong Kong and Iwakuni in Japan. They also had the crucial task of casualty evacuation.



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The Second World War confirmed the decisive importance of aircraft in tactical support of ground operations. An excellent example being the potent system of land/air warfare developed by Lieutenant General Sir Bernard Montgomery and Air Vice-Marshal Arthur Coningham during the Desert War of 1942. This doctrine for land/air cooperation also achieved some spectacular results during the campaign in Northwest Europe in 1944, when the ground attack aircraft of the Second Tactical Air Force, flying in support of Montgomery's 21st Army Group, proved to be a battle winning combination. Yet while these conclusions were readily accepted by a number of generals and senior British airmen, and even by military historians and defence intellectuals, in the years following World War II they were less enthusiastically adopted by senior military commanders in the United States. Indeed, it had taken just 5 years for the hard learnt lessons of the Second World War to be neglected at the start of the war in Korea. At the time, Wing Commander J E Johnson commented on these failings:

*"There was a lack of cooperation between the air force and army at all levels. US Air Force morale was very high, and they thought they were doing a vital job. But there were not the army officers present at briefings that we had in Europe in World War II. In the first months [in Korea] forward air control seemed very limited."*²⁵

Wing Commander 'Johnnie' Johnson was forthright in his views and quite critical of the way in which air operations were being conducted at the start of the Korean War, and in doing so, played a significant part in improving land/air cooperation. He realised that air power doctrine had not necessarily become dogma, but even worse, it had been forgotten.

*It was not just
aircrew who made
this outstanding
contribution to
United Nations air
power in Korea*

It was not just aircrew who made this outstanding contribution to United Nations air power in Korea. There were many aircraft maintenance engineers and technicians who served on the aircraft-carriers of the Royal Navy, and we should not overlook the many ground crew who kept the Sunderlands and Austers flying throughout the war. Usually working in terrible weather conditions and often at night, they did a first-class job. Extreme cold during the winter months added to the problems faced by the ground crews, yet owing to its routine and unspectacular nature, their work was rarely publicised. Other Royal Air Force officers and airmen from the ground branches also played their part. During the period of the Korean War, the United States Air Force suffered a number of manning shortfalls in some important ground trades, not least

that of photographic interpreter. The 5th Tactical Air Force was therefore reinforced with a small team of officers and airmen sent out from the United Kingdom who were skilled in interpreting aerial photographs of camouflaged installations.²⁶

The conflict in Korea is better known for the first all-jet air warfare in history. For 32 months, from November 1950 to July 1953, the United States Air Force F-86 Sabres and Russian-built MiG-15s tangled in the skies above Korea in swirling air battles. Vast dogfights swooped from very high altitudes, where the MiG-15 enjoyed advantages, down to lower levels, where the Sabre was

the master. In terms of aircraft design, swept-wing technology had come of age. The war in the air was dominated by the United States Air Force, but it should not be forgotten that Britain made a modest but significant contribution to United Nations air power in the Korean War.

NOTES

- 1 John R P Lansdown, *With the Carriers in Korea* (Wilmslow: Crécy Publishing Ltd, 1997), P 454.
- 2 William Jacob during an interview with Max Hastings for the television programme "The War in Korea", 1988.
- 3 Anthony Farrar-Hockley, *The British Part in the Korean War, Vol One* (London: HMSO, 1990), P61.
- 4 Idem.
- 5 John R P Lansdown, Op Cit, P23.
- 6 Robert F Futrell, *The United States Air Force in Korea* (Washington DC: Office Of Air Force History, 1983), P101.
- 7 William T Y'Blood (Ed), *The Three Wars of Lt Gen George E Stratemeyer, His Korean War Diary* (Washington DC: Air Force History and Museums Program, 1999), P87.
- 8 John R P Lansdown, Op Cit, P461.
- 9 Air Commodore H Probert, 'The Royal Air Force and the Korean War', *Air Clues*, Nov 1987, P442.
- 10 Idem.
- 11 Minute from Chief of the Air Staff (CAS) to Sir Harold Parker, DEFE 7/1927 dated 21 July 1950.
- 12 Ibid.
- 13 Air Chief Marshal Sir David Lee, *Eastward, A History of the Royal Air Force in the Far East 1945 – 1972*, (London: HMSO, 1984), P115.
- 14 Idem.
- 15 Air Vice-Marshal G A Chesworth CB OBE DFC RAF, 'Sunderland Operations in Korea', speaking at a RAF Historical Society Seminar, RAF Museum Hendon, 30 March 1999.
- 16 David Wilson, *Lion over Korea – 77 Fighter Squadron RAAF 1950-53* (Belconnen: Banner Books, 1994), P63.
- 17 Ibid P69.
- 18 Ibid P78.
- 19 Air Vice-Marshal John Price CBE DL RAF (Retd), 'With the Royal Australian Air Force in Korea', speaking at a RAF Historical Society Seminar, RAF Museum Hendon, 30 March 1999. (AVM Price flew with 77 Squadron RAAF in Korea in 1953).
- 20 David Wilson, Op Cit, P137.
- 21 Extract from 'The Royal Air Force and the Korean War', *Air Clues*, Nov 1987, P444.
- 22 John Nicholls, 'Air Operations in Korea', in *There Shall be Wings* by Max Arthur (London: Hodder and Stoughton, 1993) P431.
- 23 Robert Jackson, *Air War Korea 1950-1953* (Shrewsbury: Airlife Publishing, 1998), P113.

- 24 Air Chief Marshal Sir David Lee, Op Cit, P117.
- 25 Group Captain 'Johnnie' Johnson quoted from Max Hastings, 'The Korean War', (London: Michael Joseph Ltd, 1987), P306.
- 26 Air Chief Marshal Sir David Lee, Op Cit, P114.

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Royal Air Force
Hawk T1A

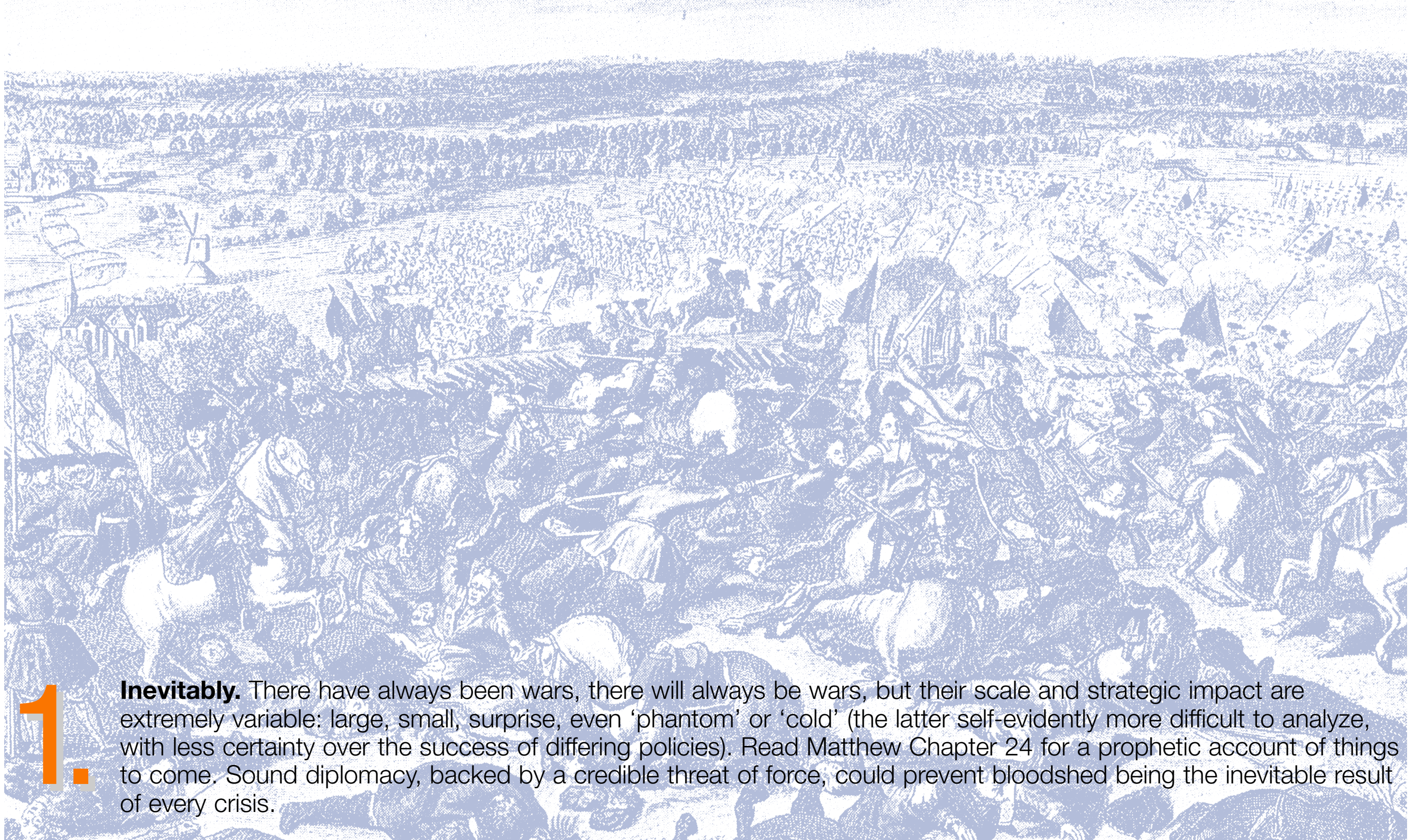
The image is a composite. The foreground on the right shows a close-up of a soldier's face, wearing a camouflage bucket hat and a uniform with a "RAF REGIMENT" patch. The soldier is looking off to the side. The background is a faded, historical-style illustration of a battle scene, showing soldiers in various poses, some on horseback, and a landscape with buildings and trees. The overall tone is serious and military.

Ten Strategic Factors

*For Those Who Aspire to Direct,
Command and Control*

UK Military Power

(with due respect to 'the principles of war')



1 **Inevitably.** There have always been wars, there will always be wars, but their scale and strategic impact are extremely variable: large, small, surprise, even ‘phantom’ or ‘cold’ (the latter self-evidently more difficult to analyze, with less certainty over the success of differing policies). Read Matthew Chapter 24 for a prophetic account of things to come. Sound diplomacy, backed by a credible threat of force, could prevent bloodshed being the inevitable result of every crisis.



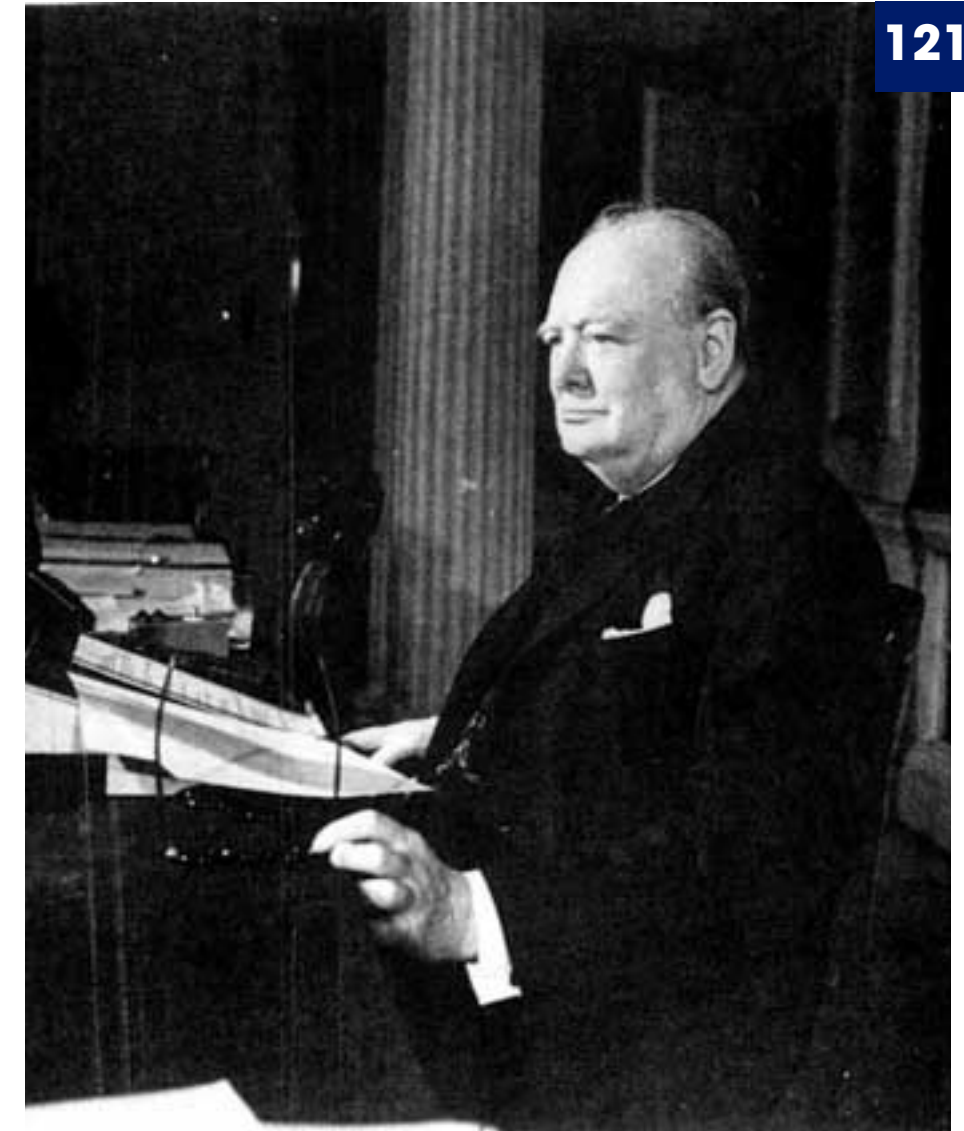
Never forget that real warfare is ugly, destructive and remembered fondly only by those who survived it without getting too close or those who revel in blood and chaos

However, even though we may go through periods of relative peace, so-called 'Ages of Reason', talk of long-term peace is wishful thinking. Therefore, some of those good old clichés come into their own: only the dead have seen the last of war; the more you sweat in peace, the less you bleed in war; if you want peace, prepare for war; train as you intend to fight and then fight how you train. Never forget that real warfare is ugly, destructive and remembered fondly only by those who survived it without getting too close or those who revel in blood and chaos.

2. **An Aim.** Focus: clear, achievable, with a vision of the desired end-state which includes a concept of how to measure ‘success’. Many hours will be spent on developing ‘Mission Statements’, ‘Implied’/‘Specified’ Tasks, all of which discipline is a good thing as it avoids confusion over something as (theoretically) simple as the *Strategic Aim*. The difficulty in the modern world is that the Aim must be understood by both the fighters and the onlookers, with the latter having a previously-unimagined level of political clout as they armchair-commentate in front of their TV. Remember the populist, ‘sound-byte’ aim, so expertly expounded by Churchill with this intuitive ability to capture the mood of the moment: “Victory... whatever it may cost”.

3. **Defensive Action.** There must be an intrinsic ability and will to survive. If one suffers the first strike – a likely outcome in non-expansionist democracies – then sufficient security must be in place to take cover, re-group and fight back. Intelligence (‘Indicators and Warnings’ devised and pursued by deep-thinking strategists) is needed, camouflage, concealment, deception, hardening, good equipment to protect against any type of attack, and downright courage (physical *and* political).

4. **Psychological Warfare.** Typical pre-match banter between opponents, reaching out to an opponent’s intellect or fears. This ‘weighing-up’ of the opposition can be enough to convince one side that it is worth making more effort to find peace. Leaflet ‘bombs’, loudspeakers, radio and TV bulletins to reduce resolve (which is why the global transmission of CNN can be so pervasive an ‘agent’). However, while offensive, Lord Hawhaw-style broadcasting is counter-productive; consider the thought process of an Argentine conscript when he discovers that there are SAS and Gurkha soldiers coming his way. But, it may be appropriate to offer/create for the enemy a way out with honour – humiliation is unlikely to pay in the longer term.



Remember the populist, ‘sound-byte’ aim, so expertly expounded by Churchill with this intuitive ability to capture the mood of the moment: “Victory... whatever it may cost”



...consider the thought process of an Argentine conscript when he discovers that there are SAS and Gurkha soldiers coming his way

5. **Leadership.** Motivating, visionary, morale-enhancing, tactically brilliant, courageous, blessed with drive and determination, trusted and/or feared in the role of 'the boss' (Unity of Command) accessible and unencumbered by vast staffs and HQs, capable of ensuring the right level of co-operation from other Services, nations and politicians. The vast majority of 'the troops' will be pretty average; they can be made match-winners by the right leaders at the different 'levels' (a Churchill, General Montgomery, Wg Cdrs Guy Gibson and Bob Braham, Col H Jones, General Schwarzkopf, or even Castro). Some people may lead by offering hard cash or instigating a regime of fear – shoot anyone who is not totally loyal and replace with a member of your own family. This can be very effective in small doses but, other than the use of a very loud voice, is not usually the Western democratic way! Some leaders may emerge only when the situation demands and people are willing to accept that kind of style (NB the rise and fall of Messrs Churchill and Thatcher). It is the leader's task to instil a passion, even an obsession, for excellence and quality (because few opponents will pay attention to 'the mediocre'), without making the workforce turn its eyes to heaven, in horror, at the very sound of these management-claptrap/familiarity-breeds-contempt descriptors. Finally, there has to be that willingness *to be led* and an eradication of that so-common cynicism and unwillingness to support/follow (a widespread trait particularly when the threat is not instantly definable by 'the common man'). It may take a few disasters before minds are appropriately focused and ready to be told what to do next.

...the Israelis were not so proactive when it came to 1973, having ignored the Intelligence assessments which had cried wolf too many times before; when it really mattered, nobody was listening

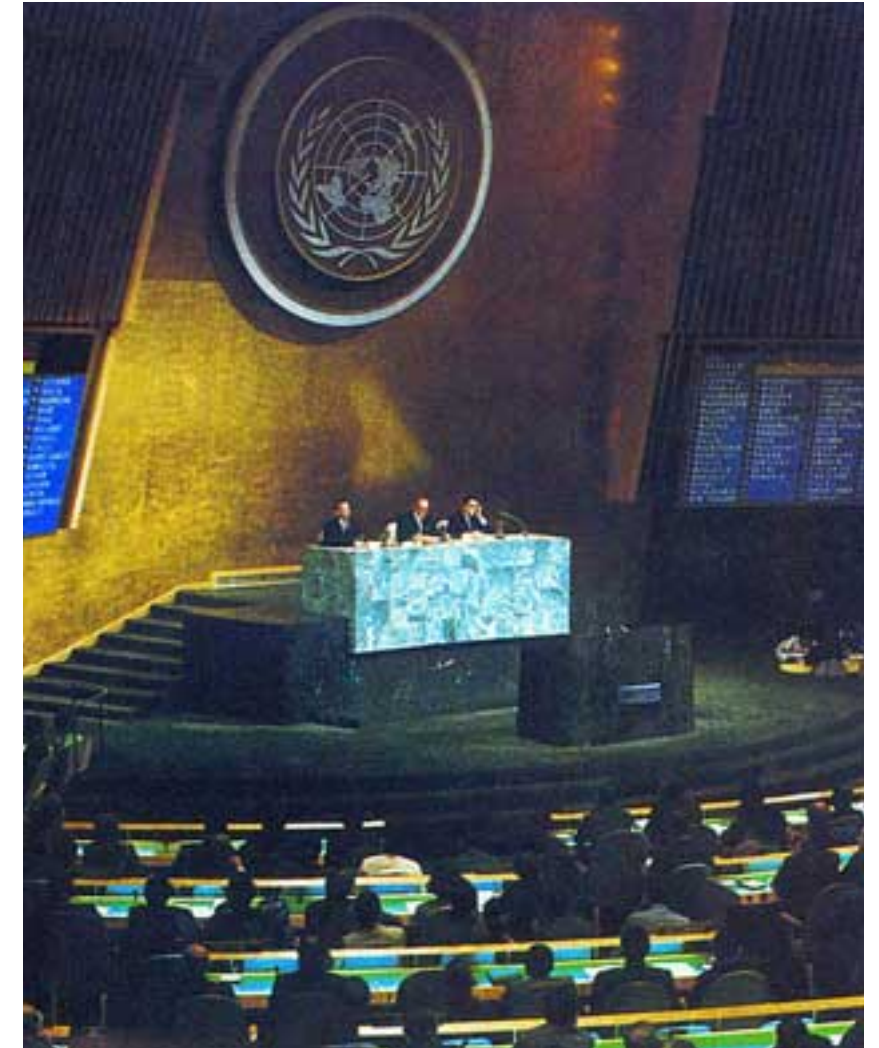


6. **Information/Intelligence.** Well-interpreted information by sharp, strategic-thinking Intelligence and Operations' staffs: spies, *accessible* recce and surveillance systems, the media propaganda war. The 7-day War was a classic pre-emptive strike in response to hard Intelligence indicating a dire threat – but then one has to be prepared for the public outcry after committing the first hostile act. Not surprisingly, the Israelis were not so proactive when it came to 1973, having ignored the Intelligence assessments which had cried wolf too many times before; when it really mattered, nobody was listening.
7. **Offensive Action.** Nobody ever won a war by being passive. The initiative needs to be wrested from the enemy, whilst protecting one's own forces, taking into consideration:
 - a. **Surprise.** This is little more than an enormous disparity in initiative between two forces: audacity, secrecy, wrong-footing the enemy. However, recall General Von Moltke's wise counsel: 'I notice that always there are 3 courses open to the enemy, and that he usually takes the fourth'. But how often are we ever allowed to use Surprise these days, in those operations short of full war, when political brinkmanship has telegraphed our every move?
 - b. **Smart Targeting.** Consider why exactly the enemy is fighting. Doubtless he thinks he can win, or he perceives himself to be right and to hell with the consequences. *Analyze the source of his power*, the 'centre of gravity' – if indeed it is possible to find just one. Without getting too wrapped up in esoteric Campaign jargon, it may be that there are several

'Decisive Points', but focus efforts on those targets which should lead to irreparable collapse in the enemy's capability (be it a mad/brilliant leader, the main sources of its commercial success, an enormous army [invariably dependent on supplies and lines of communication], or even a strategic piece of land [such as the Golan Heights]), without forgetting that control of a strategic 'piece of Air' has possibly become more relevant in this day and age. Keep 'attacking' until the job is done (which is why the Russians chose 'Annihilation' as one of their Principles of War) – but traditional *physical* attack may not always be the preferred strategy (computer viruses?) If these approaches are not possible, prepare for the worst or 'give up' gracefully for the time being and prepare to fight another day, on *your* terms.

- c. **Concentration of Force.** Never meet the enemy in a fair fight but consider how to 'sell your strategy' to those in the comfortable position of commentating rather than fighting or having to take responsibility for policy-making.
- d. **Economy of Force.** Beware 'overkill' as there are usually more targets than combatants or weapons. Beware empire creation as large groups tend to stifle ideas and initiative. 'Small is beautiful' and can be very effective (Joshua at the Battle of Jericho). We in the UK can only ever be small these days and must learn to co-operate with others to be truly strong across a wide front. On the international stage, the UK can only ever be a contributor – the trick may be to provide key capabilities, which capture headlines and boost prestige in the race for post-war economic profits. Any one nation which dominates an operation, supposedly backed by the majority of the UN, still runs the risk becoming just as big a bogeyman as the original enemy. The future 'battlefield' may be entirely different, 'fought' in the council chambers of the EU, on the floors of international money market, within vulnerable, networked computer systems, or in the hands of a very few 'Special' Forces, individuals capable of creating undreamed-of mayhem with nothing like the mass of

The future 'battlefield' may be entirely different, 'fought' in the council chambers of the EU, on the floors of international money market, within vulnerable, networked computer systems, or in the hands of a very few 'Special' Forces, individuals capable of creating undreamed-of mayhem...



people which would have been required in the past, warriors who have seriously analyzed the ‘centre of gravity’ and discovered that its destruction/disruption is relatively straightforward. Although it may not suit the conventional military machine, a government may wish to invest more widely/wisely in future, yet still under the banner of ‘National Security’.

- e. **Mobility/Manoeuvre.** Attack, move/withdraw, attack, always keeping the enemy off balance. Accept the value of little victories – they boost morale, self-confidence and political support. Build up to that all-or-nothing assault. This mindset must be fostered in training, ‘under a man’s skin’, that readiness to move quickly and create organization out of chaos. In a guerrilla-type war, mobility is the key, albeit many other factors – like a secure place in which to re-group, re-arm and re-charge the batteries – are relevant. ‘Manoeuvre Warfare’ is a popular phrase but suffers from different interpretation, the victim of policy-makers with limited vision. Until we have leaders unfettered by their personal experience of fighting in tanks, ships and specific aircraft types, prepared to consider ALL the options for achieving that end-state (which MUST include non-military and/or non-violent means,) talk of ‘Manoeuvre Warfare’ is just hot air. Beware those who are still really pursuing the concept of Attrition Warfare, glossing up their outdated strategy with high-tech, sexy gadgets but merely creating the window dressing of speedy movement between those same old battles of attrition. True Manoeuvre Warfare is extremely demanding, for both fighter and planner, but endeavour to stay in the driving seat and never stop thinking/doing/analyzing.

...Zulu warriors just knew they would win and their opponents had a pretty shrewd idea that they were right

- f. **Conviction.** There must be the desire to win, that classic ‘hunger’ for victory encountered commonly in the sports arena, exemplified by the South African victory against the All Blacks in the Rugby World Cup. On the military side, when Shaka Zulu attacked other African tribes, that conviction was there – on both sides – so that the Zulu warriors just *knew* they would win and their opponents had a pretty shrewd idea that they were right.

- g. **Chance for Peace.** Remain mindful of the chance for real peace after any particular offensive action planned. Attacking overtly civilian or religious targets will foster long-term enmity, as is any disregard of the generally-accepted ‘Laws of War’. Beware action through passion rather than logical thought. After a war, this could leave bitter memories and the desire for revenge in many hearts – further conflict (whether on a battlefield or in a court of law) is inevitable. Time does not necessarily heal; it can build a most determined, war-fighting resolve in the next generation.



Time does not necessarily heal; it can build a most determined, war-fighting resolve in the next generation

...just imagine what an F-15E would have done in 1939; do not under-invest in Research and Development

8. **Technology.** This is a potential match-winner (nuclear in Japan in 1945 and arguably the F-117 in the Gulf). It is possibly true that most new weapons disappoint, in the early days at least, but just imagine what an F-15E would have done in 1939; do not under-invest in Research and Development.

9. **People in Support.** People win wars, ordinary people made extra-ordinary by some outside influence. However, the basic fighting man still needs support from numerous sources: the people at home (especially wives and families), the media, follow-up or reserve forces, and of course the logisticians and communicators. The troops cannot fight when their bellies, magazines and mail slots are empty, or if they feel public antagonism (Vietnam), or worse still, threats to their own families back home (the American Civil War). If these 'basics' are got wrong, morale will crumble and the war will be lost.





The troops cannot fight when their bellies, magazines and mail slots are empty, or if they feel public antagonism (Vietnam)...

10. **Luck.** The harder I work, the luckier I get. But we can all do with a few breaks: the right weather, the enemy's secret codes (Battle of the Midway), using deception (a 'cunning plan') and it actually working, gaining early success which encourages self-belief and enables a success-blessed momentum to gather pace. Equally, one must be prepared for the luck to turn, and avoid the destructive feeling that 'this is not going to be my day' becoming entrenched. How many times has a football team been losing 3-0 only to win 3-4? Not often perhaps, but it certainly doesn't happen if spineless people lose heart at the first hurdle.

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ISBN: 1-85728-589-1 PB

It is, however, important to remember that air power was effectively born during total war and was nurtured in the expectancy of having a decisive role to play in any future conflict – on any scale. John Buckley takes the reader from the birth of air power, through the inter-war years, to the Second World War and then into the Cold War. He emphasises the importance of the role of air power in accelerating the trend for warfare to become more ‘total’, with the conflict between nations extending from the battlefield to affect all of the populations. While some may argue that the scale of Napoleon’s

Buckley is particularly strong in this area and his chapter on the development of air power doctrine and theory in the inter-war years is highly recommended to those requiring an introduction to the subject, His treatment of Douhet is excellent – especially as the latter's work is far more often cited than actually read. This chapter on doctrine and theory also comprehensively covers land and maritime warfare as well as the well-trodden ground of strategic bombing. Buckley includes theory from the French and Japanese perspectives in addition to covering the traditional UK, US and Luftwaffe thinking. The book then covers the War in Europe, the Far East and then goes into the Cold War era. Again for those requiring an introduction to this history, Buckley is concise and very readable. His blend of historical narrative and analysis is excellent. The academic credentials of this book are, not surprisingly, enhanced by an excellent bibliography and comprehensive end notes. This book is recommended to anyone with an interest in air power history, and particularly to those who may be tasked with conceptual thinking – whether this be for the production of essays or staff papers.

D Def S (RAF)

(Wolfgang Späte)

Including over 100 rare photographs, this book provides a fascinating glimpse into the lives of those who have made aviation history and is a unique and absorbing treatise on aviation by Wolfgang Späte, whose own flying career took him from the early gliders right through to post-war jets. Over a period of many years, Späte collected the memoirs and papers of pilots which emanate from the very earliest years of aviation to the modern test pilot age. The subjects are equally diverse: from the first tests of parachutes, to rocket-propelled explosive gliders to the 'ground-effect' flying boat.

The book includes the writings of Kurt Zwickau, Hanna Reitsch and Jean Marie Saget and many other renowned aviators. Dealing as it does with many subjects which have never been explored, it is a refreshingly new approach in a field of reading which is often found wanting in originality.

The author was born in Dresden in 1911 and after a short period working for a regional newspaper, first flew gliders in 1927. From 1934 he competed in numerous national and international competitions sometimes flying gliders he had built himself. By 1938 he had joined the élite of German glider pilots by becoming overall winner of the Rhöne Glider Competition and bearer of the Golden Achievement Award.

With the outbreak of war in 1939, Späte first served as an army reconnaissance pilot, mainly in the Polish and French campaigns, before enlisting as a fighter pilot when he saw active service in the East. In 1942 he became head of the Erprobungs-Kommando 16 (Trial Group 16) and in charge of the development of the famous Me

163 Rocket Fighter. He was appointed Commander Flying Group in 1944, and later Commander of a Fighting Wing. He was credited with a total of 99 aerial victories in the 2nd World War, rose to the rank of Major and was awarded the Knights Cross with bar.

Details: Crécy Publishing Ltd, £19.95
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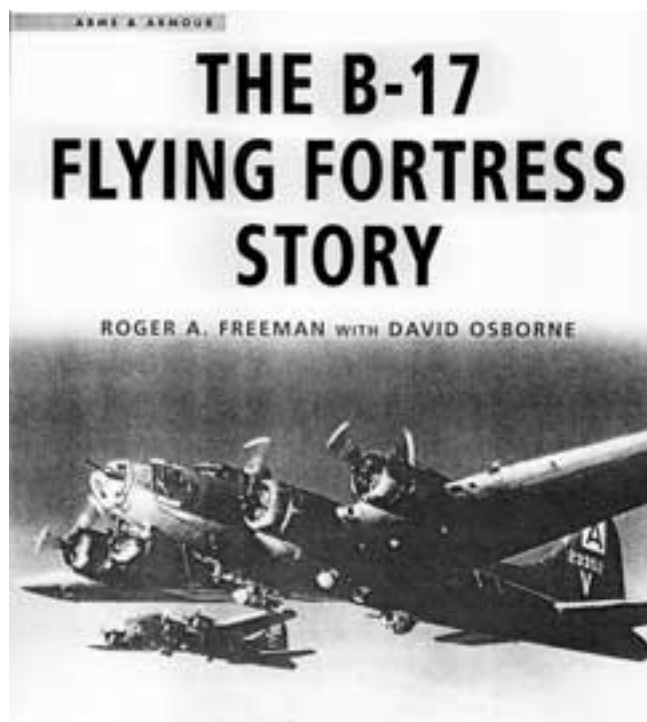
THE B-17 FLYING FORTRESS STORY

Roger A. Freeman with David Osborne

The B-17 Flying Fortress was a major factor in the success of the Allied war campaign against Germany. It was the epitome of a challenge faced, fought and won, a powerful and charismatic aircraft that achieved celebrity status and retained it throughout the war, operating extensively with the US 8th Air Force from bases throughout East Anglia.

This book is the ultimate illustrated history of the B-17. Written and researched by Roger A. Freeman, the acknowledged expert on Second World War American aircraft and their deployment in Britain, and with the help of David Osborne, it details the design and production of the bomber, its technical make-up and subsequent modifications. It also features an unprecedented abbreviated operational history of each of the 12,731 B-17s that flew in the war. This immense volume of information marks the book as a ground-breaking contribution to aviation history and an invaluable reference for the Second World War aviation enthusiast.

Details: Arms & Armour
Published: 1999 (1st 1998)
ISBN: 1 85409 5226 £19.99



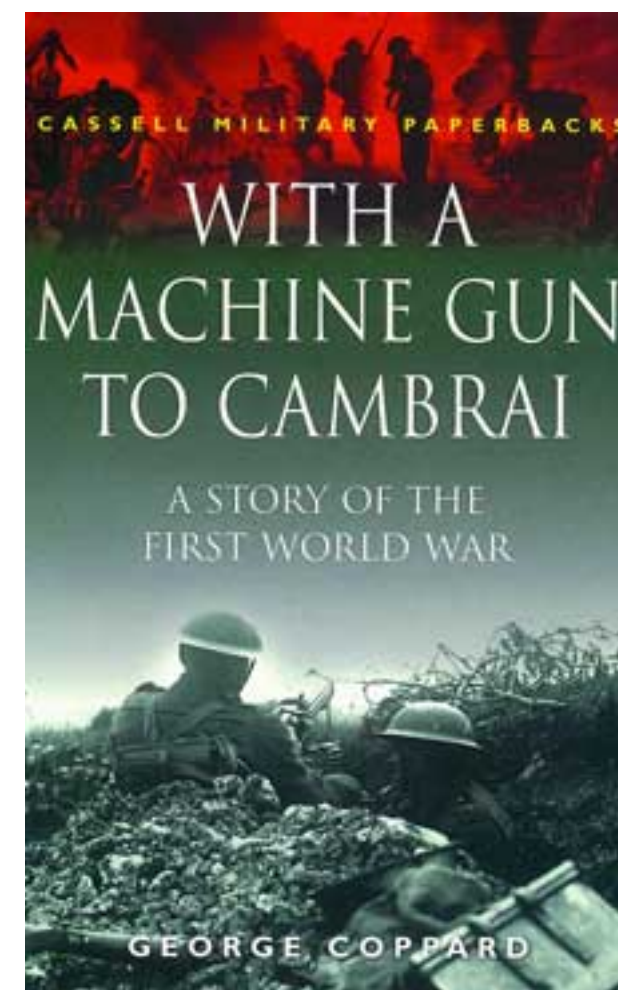
WITH A MACHINE GUN TO CAMBRAI

George Coppard

George Coppard, a sixteen-year-old from London, enlisted in Kitchener's Army in August 1914 after lying about his age. Serving with the Machine Gun Corps, he fought in the battles of Loos, Somme and Arras, and at Cambrai where he was badly wounded and won the Military Medal for bravery.

This book is based on the diaries that the author kept during his service in France. George Coppard is a natural storyteller, a lone voice speaking on behalf of all the hundreds and thousands of silent soldiers who served in the ranks. But above all this book describes what it was really like to live and fight on the Western Front – the horror and fear of battle, the comradeship and courage of the men in the trenches.

Details: Cassell & Co. £5.99
ISBN: 0 304 35258 6



Peter C Smith

This fine dive-bomber was sent up to equip three USAAF Groups and it served with great distinction in Sicily and Italy and in Burma and China, setting up an enviable sortie rate and a high profile accuracy. It also showed the way for the adaptation of the standard P-51 Mustang fighter for dive-bombing and close support. The RAF also utilised the A-36 in the dangerous low-level reconnaissance role during the Mediterranean campaign.

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Duxford Prepares for Air Show Season

The Imperial War Museum Duxford is well under way with preparations for the year 2000 air show programme. Events scheduled for July, September and October are expected to attract around 100,000 visitors in total.

The Flying Legends Air Show will take place on Saturday 8 and Sunday 9 July. Now firmly established as the premier 'warbird' show in Europe, Flying Legends brings together historic aircraft from all over Europe. Mustangs, Corsairs, Bearcats, Skyraiders, Messerschmitts and Spitfires are among the aircraft expected to take part.

Saturday 9 and Sunday 10 September is the weekend set for Duxford's Battle of Britain Anniversary Air Show. This show, sure to be the highlight of the air show calendar, commemorates the 60th anniversary of the momentous air battle which took place over Britain in 1940. RAF Fighter Command's victory during the Battle kept Hitler's Luftwaffe at bay and the anticipated invasion of Britain was cancelled. Spitfires and Hurricanes will take to the air evoking Duxford's role as a fighter base during the Battle. Pre-war aircraft and modern jets will contrast with the classic fighters of 1940.

Duxford's Autumn Air Show on Sunday 15 October will be the UK's last major air show of the year. The event will mark the 50th anniversary of the start of the Korean War and feature many aircraft types that took part in the conflict. Other aircraft from the Duxford collection will also take to the air giving the public one last chance to see their air show favourites before the winter.

Quarter of a Century for Duxford Aviation Society

On Thursday 6 April, 2000 the Duxford Aviation Society (DAS) will celebrate its 25th anniversary. The Society's members have devoted many thousands of hours of their spare time over the 25 years working on an astonishing variety of projects behind the scenes at the Imperial War Museum Duxford.

A registered charity, the Society now has more than 400 members working alongside Museum staff to restore aircraft, tanks and military vehicles and with private collectors whose flying aircraft are based at Duxford. The Society also cares for its own collection of 11 civil aircraft, amongst them the Concorde that is so popular with the Museum's visitors.

"The work of the DAS has been central to the success of Duxford" said Ted Inman, Director of Duxford. "Without their dedication Duxford would not have become the internationally renowned attraction it is today."

The Duxford Aviation Society boasts a number of specialist groups. The fire section, whose members are trained to professional fire fighting standards, provide airfield fire and rescue cover at weekends and on special events days. The Motor Transport (MT) section maintains the Museum's large collection of military vehicles, tanks and guns and the Radio Section restores and operates historic military radios, making contact with fellow enthusiasts throughout the world. The Technical Services section maintain the Society's vehicles and ground equipment and ensure that the undercarriages and wheels of aircraft are in good condition. Another group, the Duxford Associates, operate the Museum's Information Office and conduct regular guided tours of the complex.

More recently, a new 'non-working' category of membership, the Friends of Duxford' has been established. Formed just over a year ago there are now more than 1,700 Friends who, in return for an annual subscription, benefit from free entrance, reduced admission on air show days and other exclusive opportunities. The Friends of Duxford category of the DAS has proved to be extremely popular and members are now drawn from across the UK and from as far afield as Australia and America.

The Society is always looking for new members. More information can be obtained by writing to the Duxford Aviation Society, Imperial War Museum, Duxford, Cambridge, CB2 4QR or by calling 01223 836593.

Royal Saudi Air Force to Present Aircraft to Duxford

A British Aircraft Corporation 167 Strikemaster training aircraft in the livery of the Royal Saudi Air Force (RSAF) will be joining the line-up of historic aircraft at the Imperial War Museum, Duxford. Duxford, Europe's premier aviation museum, houses an impressive collection of over 180 aircraft and is a natural destination for the retired Strikemaster.

The aircraft was presented to the Museum by the Deputy Commander of the RSAF, His Royal Highness Prince Turki bin Nasir, in an official ceremony on Thursday 13 April. It was accepted on behalf of the Imperial War Museum by its President, His Royal Highness The Duke of Kent.

Between 1968 and 1977, the RSAF took delivery of a total of 47 Strikemasters in three separate batches. All the aircraft were used for training purposes at the King Faisal Academy in Riyadh until 1997, making Strikemaster one of the longest serving aircraft in the RSAF inventory.

The introduction of the Pilatus PC-9 trainer resulted in the gradual phasing out of Strikemasters, and it was last flown by the RSAF on 4 January 1997.

With all Strikemasters now having left service, the RSAF decided to gift an example to the Imperial War Museum. The chosen aircraft was shipped by the UK by container from Jeddah Islamic Port.

After refurbishment at Warton Aerodrome in Lancashire by BAE SYSTEMS (the new company formed by the merger of British Aerospace and Marconi Electronic Systems), it was dismantled and road transported by the Royal Air Force to Duxford for re-assembly.

The BAC 167 Strikemaster entered service in October 1967 as a proven development of the 1950s Jet Provost training aircraft with enhanced ground attack capability. The British Aircraft Corporation (forerunner of British Aerospace and, more recently, BAE SYSTEMS) manufactured Strikemaster as a multi-role aircraft for training or combat missions, as required. Some 146 examples were supplied to air forces world-wide.

Exceptionally good handling and manoeuvrability are major features of the aircraft which is powered by a Rolls Royce Viper Mk 535 turbojet engine.

Duxford Director Receives Aviation Accolade

Ted Inman, the Director of The Imperial War Museum Duxford, has been made a fellow of the Royal Aeronautical Society. This prestigious appointment has been made in recognition of Duxford’s position and standing within Britain’s aerospace community.

Mr Inman, Director of Duxford since 1978, has overseen a host of significant changes at the museum, most notably the design and construction of the award-winning American Air Museum, purpose built to house Duxford’s outstanding collection of American combat aircraft. Under his direction, the museum now attracts over 400,000 visitors per year and is renowned across the world as a centre of excellence.

Founded in 1866, the Royal Aeronautical Society is the oldest society of its kind in the world and has evolved as the global focal point for the entire aerospace community. The Society works to ensure the highest standards for professionalism in all aerospace disciplines and is a unique source of specialist information and a central forum for the exchange of ideas. “The Fellowship is a great honour for both Duxford and for myself” said Mr Inman, “I am sure this will spur us on to even greater achievements in the future”.

The Imperial War Museum Duxford has a collection of over 180 historic aircraft and an outstanding collection of tanks, military vehicles and artillery. The museum is open year round and is one of the country’s major tourist attractions.

CAMBRIDGE UNIVERSITY AIR SQUADRON - 75TH ANNIVERSARY

Cambridge University Air Squadron celebrates its 75th anniversary this year and hopes as many ex members as possible will attend one of the events we plan to arrange. Any past CUAS staff, students and honorary members are invited to contact the Adjutant, Cambridge UAS, 2 Chaucer Road, Cambridge CB2 2EB.

Telephone 01223 356942
Fax 01223 302284
e-mail sn65@dial.pipex.com



ANOTHER AIRCRAFT FOR RAF MUSEUM COSFORD

An aircraft originally designed for light passenger and business use, and later adopted by the RAF and Fleet Air Arm as a crew trainer, will have made its last flight in May this year.

The Handley Page Jetstream, built at Radlett in 1969, flew into RAF Cosford on Tuesday, May 23, destined to become the latest

acquisition to be displayed along with more than eighty other aircraft at RAF Museum Cosford.

After the prototype Jetstream flew in August 1969, development costs forced the Handley Page company out of business in 1970. A succession of companies kept the design alive and Scottish Aviation at Prestwick took over in 1972 with a production order for 26 pilot training aircraft for the RAF.

Eleven aircraft are still flying with No 3 Flying Training School and No 45 (R) Squadron at RAF Cranwell, Lincolnshire, teaching students skills such as crew co-operation and how to cope with in-flight engine failure.

Cosford's Jetstream – initially registered G-AYWR – was re-built in 1971. In 1975 it was sold to the Morgan Crucible Co. Ltd, the leading UK maker of industrial ceramics, as an executive aircraft. In 1983 it was registered to Rig Design Services Ltd but three years later was moved to British Aerospace at Woodford, Greater Manchester, for inter-site shuttle use.

In 1989 it became a flying test bed for avionics and sensor research programmes – the start of a decade of test duties. Its full conversion to test bed role began at Cranfield University in Bedfordshire in 1991, and in 1996 the aircraft was detached to Edwards Air Force Base in America for advanced short range air-to-air missile development trials. Latterly it has been stored at Cranfield after a test bed career covering more than 300 flights in support of British Aerospace research and development programmes.

THE COASTAL COMMAND AND 18 GROUP OFFICERS' REUNION

Each year the Coastal Command and 18 Group Officers' Reunion is held in the Northwood Headquarters Officers' Mess. This year's event will be held on Saturday 25 November 2000. Past and Present Members

of Coastal Command, 18 Group and 11/18 Group (Maritime) are invited to attend. For further details contact Sqn Ldr Bob Hall at Northwood, Tel 01923 846312 (BT) or 9360 46312 (GPTN).

CENTRE OF GRAVITY

Dear Sir

I thoroughly enjoyed Squadron Leader Walters' clearly articulated and well researched article on targeting in Air Power Volume Two Number Four. I must however take issue with the author's understanding of the term Centre of Gravity. In his opening paragraph Squadron Leader Walters states that "the essence of air strategy is to identify the enemy weaknesses, termed centres of gravity". Whilst I would agree with the first statement which reflects the essence of manoeuvre warfare, where a commander seeks to apply strength against identified weaknesses, I cannot agree that these enemy weaknesses are invariably a Centre of Gravity.

United Kingdom Doctrine for Joint and Multinational Operations uses the agreed NATO definition of Centre of Gravity – "Characteristic(s), capability(ies), or locality(ies)

from which a nation, an alliance, a military force or other grouping derive its freedom of action, physical strength or will to fight".² The use of the singular/plural reflects the different approach of individual nations; for example, the United States military force subscribe to multiple Centres of Gravity whereas United Kingdom doctrine subscribes to a single Centre of Gravity at the strategic and operational levels. Furthermore, both friendly and adversary have a Centre of Gravity at these levels.

When developing the joint campaign and the air strategy which will support the Joint Task Force Commander, a vital element will be to identify decisive points which will be key to unlocking the enemy's Centre of Gravity. The NATO definition of decisive points is: "Those actions, the successful completion of which are preconditions to the elimination of the enemy's Centre of Gravity".³ Much targeting will, therefore, inevitably be focused toward decisive points in an effort to affect the enemy's operational and strategic Centre of Gravity.

The joint campaign and all supporting operations will be developed using Lines of Operation which are "the link between decisive points in time and space on the path

to the Centre of Gravity”.⁴ These lines of operation will include information lines and individual environmental lines, all of which must be synchronised under a single campaign plan. Synchronisation will be the key driver of campaign phasing. Poor synchronisation will result in missed opportunities and may result in one line of operation having a detrimental affect on another.

Whilst much of the focus is based on attacking an enemy Centre of Gravity it is equally important to protect the friendly Centre of Gravity and decisive points. An enemy will inevitably try to unlock our own Centre of Gravity, therefore, equal emphasis must be placed during campaign planning and operations on ensuring that our Centre of Gravity and decisive points are protected as on attacking the enemy’s Centre of Gravity and decisive points.

Wg Cdr P. Teakle, RAF
NOTE

1 British Defence doctrine, JWP 0.01.4.8
2 United Kingdom Doctrine for Joint and Multinational Operations, JWP 0-10, Glossary – 1.
3 United Kingdom Doctrine for Joint and Multinational Operations, JWP 0-10, Glossary – 3.
4 Ibid, Glossary – 5.

ROYAL AIR FORCE HISTORICAL SOCIETY

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Force activities in the past and those concerned today so that we can learn more about its history.



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