



AIR POWER REVIEW

VOLUME 21 NUMBER 2

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Reviewed by Dr Alastair Noble

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FOREWORD

BY GROUP CAPTAIN JAMES BELDON,
DIRECTOR OF DEFENCE STUDIES

This second edition in the special Centenary series of *Air Power Review* starts as the World, weary from war but brightly optimistic about a new era of peace, was soon cast into a new era of strategic competition between the capitalist West and the Communist East. The Cold War, which is how the World (prompted by George Orwell's first use of the term in a 1945 essay entitled *You and the Atomic Bomb*) came to call the period from approximately 1947 to the fall of the Soviet Union in 1991, dominates this edition – and although the Falklands and Gulf War 1 may in isolation appear somewhat disconnected from the grand strategic struggle between East and West, the context in which they occurred, and the doctrines that were applied in those conflicts, were firmly rooted in the Cold War.

This edition's opening article re-examines the first major confrontation of the Cold War – the Berlin Airlift. By 1948, the handshakes between British and Soviet soldiers on the banks of the Elbe in 1945 were but a distant memory. Civil war in China had re-commenced between Chiang Kai Shek's Nationalists and Mao's Communists, and the Greek Government backed by the UK and USA was desperately fighting off an aggressive Communist revolt. But although far from being unimportant, these crises were nevertheless strategically less critical than the direct challenge that the Soviets posed to the Western Allies when they closed surface lines of communication from the western zones of Germany to Berlin in 1948. In his article, Seb Cox gives a detailed analysis of the crisis and the colossal scale of the Berlin Airlift. From an air power perspective, the precision of the planning, sequencing and logistical support required to pull off arguably the greatest humanitarian feat of all time is captivating – as is the remarkably low accident rate that was experienced, especially in an era when aviation was a relatively risky business, and weather presented a severe obstacle to operations. From a strategic perspective, the Allies' success was unusual in that it bore the hallmarks of a victory, but one borne of peaceful action. It was a new era, of course – one darkened by the shadow of the mushroom clouds of Hiroshima and Nagasaki. The costs of extreme violent confrontation had become not only unimaginable, but, in an era later to be partially defined by the concept of 'Mutually Assured Destruction (MAD)', un-enactable....or so people hoped.

Such thinking underpinned the basis of strategic nuclear deterrence, in which the Royal Air Force's V-Force was the UK's principal actor until 1969. Clive Richards delivers a detailed analysis of the credibility of Bomber Command in discharging its deterrent responsibilities in the period 1955 to 1962, tested to the full in the Cuban Missile Crisis of October 1962. The transfer of the nuclear deterrent from the RAF to the Royal Navy

in 1969 brought renewed prominence to the RAF's maritime patrol force, quite rightly described by Group Captain Rob O'Dell as the 'Cinderella Service'. His article, which spans the whole of the Cold War and beyond, describes the highs and lows of the RAF's maritime patrol force, and provides a very interesting juxtaposition to Professor John Buckley's article on Coastal Command's contribution to victory in the Second World War, which featured in Edition 1 of this Centenary series of *Air Power Review*.

The Falklands Conflict of 1982 takes centre stage in the twin essays co-written by Wing Commander John Shields and Dr David Jordan. Both articles offer clear and balanced perspectives on the impact of Royal Air Force air power on the prosecution of the British campaign in the South Atlantic. The authors' exposure of the false rumours and confirmed evidence of inter-Service rivalry may make uneasy reading, but unearthing such episodes is important for newer generations in seeking to overcome differences and exploit the unique attributes offered by different branches of the Armed Forces in pursuit of our country's operational and strategic aims.

I am delighted to include in this edition two first-hand accounts written by recently retired senior officers, whose collective recollections of the Falklands Conflict and Gulf Wars 1 and 2¹ provide an invaluable insight not only into those conflicts themselves, but the implications they had for the Royal Air Force's future development. I am extremely grateful to both Air Commodore Ian 'Paddy' Teagle and Air Commodore Al Byford for the honesty and humility of their contributions to this edition – they are unique and important additions to the Royal Air Force's history, and the authors' reflections provide a rich source of advice for junior officers and senior commanders alike.

Finally, I must thank Colonel Professor John Andreas Olsen of the Royal Norwegian Air Force for his fine introductory essay on the virtues of studying air power, and the role that this journal has played internationally in promoting critical thinking and debate on the subject. *Air Power Review* is, of course, only as good as its contributors' articles, and so I should like to complete this foreword by inviting all of our readers to play a part in advancing the professional discourse on air, space and cyber power. We welcome articles from all quarters, whether academic or practitioner, historian or theorist, from the UK or from anywhere around the World. And we would also encourage you to engage in the Royal Air Force Centre for Air Power Studies Facebook and Medium pages. We look forward to hearing from you.

¹ Owing to the temporal span of Air Commodore Teagle's article, we have intentionally breached the defined epoch of this edition to cover his experiences of the 2003 Iraq war.

THE TRUE WORTH OF AIR POWER STUDIES

BY COLONEL JOHN ANDREAS OLSEN

Biography: John Andreas Olsen is a Colonel in the Royal Norwegian Air Force, currently assigned to London as Defence Attaché to the UK and Ireland. He is a Visiting Professor at the Swedish Defence University and a Non-Resident Senior Fellow at the Mitchell Institute for Aerospace Studies. His assignments have included tours in the Ministry of Defence and NATO Headquarters. He has a doctorate from De Montfort University. His latest publications are *Airpower Reborn* and *Airpower Applied*.

Over the last three decades Western air power has come to play an increasingly important role in national security, international relations and warfare, to the point where successful military operations are now virtually impossible without the extensive employment of air power. Whether air power is the leading or supporting element depends on the strategic context and political objective of a given operation, but applied to its fullest extent air power can greatly ease the task of all other forces. Consequently, air power has become the ‘Western way of war’ – the preferred military choice for political leaders – because it offers the prospect of military victory without large-scale destruction and loss of life.

To appreciate the current impact and future relevance of air power, air professionals need to understand the past. Every one of us must reconsider air power history, revisit its place in society writ large, rethink concepts and paradigms of war and constantly relearn lessons. To grow and prosper, our national air services must provide a nurturing setting for such studies: establish a dynamic and vibrant environment for mastering aerospace history, strategy and doctrine and create a milieu for cultivating broader insight into air power by capturing thoughts in writing for further scrutiny. This effort should focus on air power’s contribution to national strategy and political objectives, emphasising strengths, limitations and potential as opposed to promoting air power as an end in itself. The subject of air power must as such be examined without fear or favour. The dialogue must not centre on technology and platforms, but rather on air power’s ability to create strategic effects. In short, it must, like all other forms of power, be assessed objectively on its own merits.

The Royal Air Force has been and continues to be a leader in this respect. In 1977 the RAF created the position of Director of Defence Studies. Then Group Captain (later Air-Vice Marshal) Tony Mason ensured the relevance of this function from the start, and the RAF Centre for Air Power Studies has since developed a strong reputation in the sphere of air and space power debate through publications, conferences, university degree

programmes and cooperation with academic institutions. The RAF's *Air Power Review*, which came into being in 1998, has been a constant source of inspiration and education, publishing wide-ranging and at times thought-provoking articles. The RAF has also taken doctrine seriously, as it has consistently sought to improve the vocabulary, language and concepts of air power to match the ever-changing geopolitical landscape. Therefore, the RAF has played a leading role in ensuring that the scholarly literature on air power has matured significantly over the last three decades, helping to make the study of air power ever more intellectually honest and academically respectable. Further, the RAF has had an immense impact on the international air power community's thinking. Air power professionals may first gain an appreciation of the true worth of air power studies by reading, but eventually the value of such studies manifests itself in the conduct of air operations, alone or as part of a larger joint campaign.

The RAF 2018 Centenary offers three special editions of the *Air Power Review* – a benefit for all students and practitioners of air power. This volume covers the period from the Berlin Airlift – where air power achieved a great and notable strategic success without the use of overt combat force – to the Gulf War of 1991 – the most successful air campaign ever implemented. The Cold War period between the successful mastery of air power in World War Two and the renaissance of air power from the 1990s onwards is in retrospect often viewed as the dark ages, not least because of its association with the nuclear arms race. But those decades also have much to offer students of air power in terms of insight into strategic deterrence, operational utility, tactical proficiency, technological development, conceptual advances and organisational improvement. The Royal Air Force took the lead in Europe in all six areas through its determination, leadership and professionalism.

The essays in this volume should be read carefully and critically, to compare and contrast the ideas and activities described with present operations to continuously improve our understanding of how to use air power responsibly as a political instrument. After all, ultimately the purpose of air power studies is to improve the practice of air power.

AN EFFORT OF BIBLICAL PROPORTIONS - THE BERLIN AIRLIFT 1948-1949

By Mr Sebastian Cox

Biography: Sebastian Cox has been the Head of the Air Historical Branch (AHB) since 1996. Having previously worked at the RAF Museum, he has been a member of the AHB staff since 1984. He holds degrees from Warwick University and King's College London, is a Fellow of the Royal Historical Society, and was awarded an OBE for services to RAF history in 2017.

Abstract: In the early months of 1948, Britain, the United States and France became frustrated at Soviet obstructionism over economic reform in Germany, which theoretically required all four powers' agreement. The Western Allies determined to introduce reforms, including currency reform, in the Western Zones with or without Soviet agreement. The Soviets, recognising an economic and political threat to their position in Germany, instituted a blockade of land routes into Berlin. The Allies used air power to airlift supplies to a city of 2.5 million people isolated in the middle of the Soviet Zone. Short of an act of war, or the airlift failing (as the Soviets expected it would) the Soviets could not prevent the aerial relief operation and were eventually forced to concede defeat in the first serious clash of the Cold War.

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In the beginning, God created Heaven and Earth. Then he created the Berlin Airlift to cure keen pilots of their sinful desire to fly aeroplanes.

Wing Commander “Mick” Ensor DSO* DFC* AFC RNZAF & RAF

Wartime veteran of Coastal Command, after flying 200
airlift sorties with 206 Squadron on the Avro York.

INTRODUCTION

Relations between the victorious Allied powers, Britain, the USA and the USSR during the Second World War were not always entirely harmonious. However, they did, through summit meetings at Yalta and Potsdam and via a joint European Advisory Council (EAC), settle the outlines of their post-war intentions and policies towards a defeated Germany. Amongst the many issues they agreed in outline were the boundaries of the three occupation zones, soon extended to four with the addition of a French zone. Berlin had been the capital of Germany since German unification in 1871, and the boundaries agreed placed the city deep inside the Soviet Zone but it too was to be sub-divided zonally between the four occupying powers. The EAC proposed that each occupation zone should have a military governor with wide powers and that they would act collectively through an Allied Control Council (ACC) to reach agreement on matters of common or wider interest such as German disarmament, de-Nazification, and the post-war German economy and government including elections. Some western officials wanted to include formal agreement on access corridors to Berlin through the Soviet Zone but, partly because the US military regarded that as solely a matter for them, and partly because others were anxious to maintain good relations with the Soviets and believed any problems would be solved with patience and goodwill, no such agreement was included.¹ The only question of access on which the occupying powers reached agreement was in respect of the air. There was a general recognition that the immediate post-war situation whereby pilots did more or less as they pleased in the airspace around Berlin (and which had led to a number of near misses) needed to be addressed. Consequently, on 30 November 1945 the ACC approved a paper which created three air corridors into Berlin from the Western zones, each twenty miles wide and extending from the ground to 10,000 feet and meeting a circular zone above Berlin twenty miles in diameter. Traffic was directed by a quadripartite Berlin Air Safety Centre.² The deeper significance of this agreement was not recognised at the time, but it was to provide the firm legal basis for what followed and was to prove the key element in ensuring the Western Allies’ continued position and presence in the city beyond 1948.

It was soon to become apparent that goodwill was notably absent from Soviet political discourse. Worse still, the EAC proposed that the ACC must reach unanimous conclusions, which effectively granted the Soviets the power of veto and significant scope for obstruction and delay should they be so minded, which, as it turned out, they frequently were. The requirement for unanimity was, as Ann and John Tusa point out,

‘a destructive weapon whose use could prevent the formulation of common policies and bring fatal discord into four-Power government’.³ The EAC also proposed that Berlin, though subdivided, would be governed by the three (later four) powers on the same principle, through a Kommandatura consisting of the three military governors. Here too, the Western allies had stored up trouble for themselves.

The ‘Big Three’ – Churchill, Roosevelt and Stalin – accepted the EAC proposals at Yalta. Once victory was secure, the leaders met again at Potsdam for a summit lasting just over two weeks, but now Roosevelt was dead and Churchill departed after just three days, defeated in the general election and replaced by Clement Attlee and his foreign secretary Ernest Bevin. Attlee was shrewd and had few illusions about Stalin, and Bevin was a socialist who had spent his life fighting against communists in the trades union movement. Neither harboured many illusions about the Soviet leader and Potsdam was where early signs of the Soviet attitude were first manifest, with Stalin unilaterally announcing his redrawing of Germany’s eastern borders. If the western military harboured any expectations that some ‘brotherhood of arms’ from the wartime alliance would be evident in their relations with the Soviets, they were rapidly disillusioned. Colonel Howley of the US Army led the first convoy of military vehicles to cross into the Soviet Zone on 17 June 1945 expecting to form the advanced guard of the US Garrison in Berlin. As soon as they crossed the bridge from the American zone they were stopped by Soviet troops who demanded that the size of the convoy be reduced by half. When they reached Berlin they were again stopped and redirected to the suburb of Babelsberg outside the city where they remained for a week before being allowed to proceed to their barracks in the city, which the Soviet Army then handed over with much parade-ground pomp and ceremony, only for the Americans to discover once inside that they had stripped the barracks of everything right down to the light fittings, toilets and hand basins. Had they but known it, the Americans had just received an early lesson in the Soviets’ approach to “reparations,” which included removing everything down to literally the kitchen sink. Howley’s men camped out for a week in the woods. The first British column did not fare much better, being told that all the Elbe bridges had necessarily been closed for “repairs”. A swift reconnaissance soon located an unguarded crossing and the column proceeded only to meet further bridge problems in Berlin where the Soviets had “accidentally” destroyed a bridge over the Havel. The British too camped out – on the site of the 1936 Olympics.⁴ The RAF party sent to occupy Gatow airfield met with an even more frosty reception, being promptly detained in a hangar for twenty-four hours and the commander of the initial unit, Wing Commander Ellis of 19 Staging Post, was kept under lock and key for a further twenty-four, ostensibly on the grounds that he had arrived “too early”!⁵ These were the early manifestations of a deliberate obstructionism from the Soviet authorities, petty or serious, physical or bureaucratic or both, and the rationale, as with the bridges, was often transparently false: it was an attitude, indeed a policy, with which the western allies were to become all too familiar.

When the British and American troops reached Berlin they found it was a city in name only. Devastated by Bomber Command's and the Eighth Air Force's bombers it had also been pounded by Soviet artillery during the fierce and bloody battle inside the city which characterised the last days of the Third Reich. The urban landscape in large parts of the city consisted not of streets between buildings, but roads bulldozed between two piles of rubble, beneath which many of the inhabitants lived a troglodytic existence in the cellars below the ruins. Life for the inhabitants was especially grim, not merely because of their living conditions and the lack of basic amenities (for example, none of the city's eighty-seven sewage systems was functioning), but also because of the behaviour of the occupying Soviet Army. The Soviets engaged in both official and unofficial looting on a gargantuan scale. As "reparations", they stripped Eastern Germany bare of industrial plant, moving 3,500 factories and more than a million pieces of industrial plant to the Soviet Union. This left two million workers without jobs, but they may have been the lucky ones as thousands of individuals with technical or managerial skills the Soviets lacked were themselves forcibly removed to the Soviet Union.⁶ The Soviets also utilised former concentration camps such as Buchenwald for "re-education" of those who dissented, branding them as Nazis. It has been estimated that some 200,000 people were sent to these camps between 1945 and 1950 and that a third of them died.⁷ These were the actions of Soviet officialdom: the behaviour of the Soviet troops was equally problematic for Berliners. The barbaric behaviour of the German invaders in Russia and the brutality of life in the Soviet Army bred a contempt and desire for revenge which the Soviet authorities had little inclination to curb.

There were undoubtedly instances of western occupiers engaging in such practices as looting and rape, though they also tended to use "economic" muscle to obtain what they wanted from German women rather than physical muscle. Western armies, however, made at least some attempts to curb and punish such activities. The attitude of the Soviets was exemplified by Stalin himself, who when challenged on the behaviour of his troops became tearful and told his interlocutor he could not understand the problem 'if a soldier has crossed thousands of kilometres through blood and fire and earth and has a little fun with a woman or takes some trifles.'⁸ Soviet soldiers had little to offer economically in any case but were temperamentally disinclined to offer anything to a German in exchange for something that they could take by force. Rape was therefore a horrific fact of life for German women in any area controlled by the Soviets. Looting was equally condoned with anything valuable - watch, bicycle, jewellery etcetera - simply appropriated at the point of a gun or bayonet. Items were not merely looted but often gratuitously smashed before their owners' eyes. This activity continued long after the trauma of combat had subsided. It bred in the German population, including the Berliners, feelings of utter contempt and hatred for the Soviets which were to prove of immense political importance as our story unfolds. One Soviet commissar did apparently comment: 'This will cost us a million roubles a day - political roubles.'⁹ He was an insightful

exception, as Soviet troops effectively undermined the efforts of the cohort of German communists imported from Moscow to organise the political takeover of Berlin.

The Soviets and German communists did their very best simultaneously to appear true democrats, appointing members of other parties to administrative posts and publishing a manifesto devoid of Marx or even socialism. But theirs was a deliberate waiting game – they also gradually sought to intimidate opponents and tried hard to engineer a merger of the Communist Party of Germany with the Social Democratic Party of Germany as part of their long term strategy to undermine and take over government by stealth. The Social Democrats would have none of it and engineered their own referendum amongst their members on the proposed merger which was roundly rejected – except in the Soviet Zone where the result, defeat for the proposal, was declared “irrelevant” and a forced merger instigated to form a new party, the Social Unity Party. In the 1946 elections to the City Assembly on 20 October 1946, the Social Democrats got 48 per cent of the vote and 63 seats, with the Social Unity Party getting only 19.8 per cent overall and just 21 per cent in the Soviet Zone despite rigging and intimidation, giving them just 26 seats. The Christian Democrats had 29 seats and the Liberals 12.¹⁰ The attempt to manipulate elections to allow the Communists a “democratic” takeover of the city had clearly failed. The Soviets attempted to circumvent the vote by stating that a phrase in the agreements requiring the Kommandatura to give permission for appointments to the City Government also applied to elected individuals. The Allies demurred, but eventually after six weeks allowed three Social Unity Party members to serve on the eighteen-man city executive and agreed to exclude three men that the Soviets vetoed.

The fate of Berlin was, however, not simply tied to local politics. Equally, if not more, important was the fate of Germany itself. At Potsdam it had been agreed that Germany would be governed as one economic entity. The Soviets had used this to demand, and continue to demand, that some production and resources from the western zones be transferred to them, but steadfastly refused to operate in a similar fashion in respect to food, at least until reparations had been settled. As eastern Germany had been the source of much of Germany’s food supply this caused serious problems for the western allies. The British, for example, had to import a million tons of food into Germany in the ten months after the War at a time when rationing in Britain was still in place and was actually set lower than the wartime level. The Chancellor of the Exchequer characterised the annual cost of £80 million as ‘paying reparations to the Germans.’¹¹ Germany was on the verge of starvation and, as the American Military Governor remarked, ‘There is no choice between becoming a Communist on 1,500 calories and a believer in democracy on 1,000 calories.’¹² The increasingly frustrated western Allies were realising that the prospects for German recovery in the face of Soviet intransigence were slim and that economic reform with or without the Russians was essential, not just for German recovery, but for Europe. In July 1946 the British and Americans announced that they would combine their zones to create a single economic entity – the so-called BiZone.

A more far-reaching and fundamental reassessment of American policy soon followed the appointment of a new US Secretary of State, General George C Marshall, after whom a new regenerative policy to aid Europe was to be named. The Marshall Plan, announced in June 1947, offered economic assistance to all who desired it, including the Soviets.

Stalin predictably rejected it. His plan was, and always had been, to achieve a communist Soviet-dominated Germany, which in turn could be utilised to undermine liberal democratic government in Europe, particularly France and Italy. It was politically impossible for him to accept Marshall aid and the Soviets also prevented any satellite nation from accepting. In October 1947 the Soviet foreign office concluded that Britain and the US were moving towards dividing Germany and preventing Soviet access (which they were still demanding) to the resources of western Germany, notably the Ruhr.¹³ Soviet attitudes hardened still further, as did those of the West. The US, the UK and France, together with the Benelux countries, held a conference in London in early 1948 which agreed to the economic merger of all three western zones and the establishment of a federal government – in other words, agreed to lay the foundations of the future Federal Republic of Germany. Division of Germany was now very close to reality. The Conference met during one of the coldest UK winters on record but, as it convened, the real chill came with the news of a communist coup carried out against the democratically-elected government of Czechoslovakia, with a Soviet Deputy Foreign Minister in Prague and Red Army units on the border. The result in Prague may have pleased Stalin in the short term, but its long-term effects were less positive for him; after the agreements in London, several European powers signed a mutual defence agreement in Brussels in March and during the same month Western European and North American states began preliminary discussions on a possible Atlantic pact.

In addition, the British and Americans moved to introduce currency reform. The official currency in Germany, including Berlin, was the “Occupation Mark”, but the Soviets had insisted on being given a set of printing plates which they then used quite literally to print money which they paid to their troops, often including large amounts of backpay. At the same time, the official exchange rate for O Marks to the dollar was \$1 to 10 O Marks, but the black market rate was \$1 to 1,500. A US soldier could change \$10 on the black market for 1,500 O Marks and then change those black market Marks back officially for \$100 making a swift and profitable killing of \$90 on his \$10 investment.¹⁴ The predictable result was rampant inflation, a nightmare for any German normally, but especially so for those with memories of the Weimar Republic.¹⁵ The establishment of a Central Bank for the western zones presaged the currency reform that the British and Americans were planning.

In Berlin, the Soviets had started counter-moves following the London conference. They determined on a policy to harass and to restrict and “regulate” western access to the city. Marshal Sokolovsky, the Soviet Military Governor, was summoned to Moscow on

9 March 1948. On his return, he attended a meeting of the Allied Control Council on 20 March looking, according to the British Governor, General Robertson, 'tired and grim', as well he might. He circulated a paper demanding details of the London conference and the British and Soviets each accused the other of taking unilateral actions. Receiving no satisfaction on the London conference, Sokolovsky walked out of the meeting declaring it closed.¹⁶ Though the western Allies did not know it, the ACC was never to meet again. The previous day Stalin had remarked to German communist leaders 'perhaps we can kick them [i.e. the Western Allies] out'.¹⁷ Late on 31 March, General Dratvin, Sokolovsky's deputy, delivered a letter telling the western powers of 'certain supplementary regulations' governing traffic between the Western Zones and Berlin'. It gave twenty-four hours' notice that goods and persons passing through the Soviet Zone were to be subject to inspection and approval by the Soviet authorities.¹⁸ The harassment actually began much earlier. Two British military trains from opposite ends of the corridor were stopped that night, and when inspections were refused they were shunted into sidings. A British woman climbed down and, helped by soldiers, built a bonfire, and true to national form made food and, more importantly, tea. On the other train, the Britons made friends with the Americans on the next door train who had been similarly side-tracked, and also made bonfires and learnt how to eat US steak-and-kidney pudding using toothbrushes and nail files.¹⁹ Eventually the trains returned whence they came and the British and Americans cancelled all further rail moves. Further harassment followed, and on 9 April the Soviets closed the autobahn. None of these measures yet added up to a full blockade and later in the month the military trains resumed. However, the Americans in particular, and the British to a limited degree, reacted by flying people and material in and out of the city. The British had only two Dakotas and an Anson available, whereas the Americans utilised thirty C-47s. In what was subsequently known as the "Little Lift", the USAF flew in over a thousand tons of goods, including food, in April.²⁰ The British did not at this stage deploy more aircraft though the British Army of the Rhine did request that the HQ of the British Air Forces of Occupation* on 4 April investigate whether the garrison could in future be supplied by air. An Operation Order was drawn up allowing for a lift of 65 tons per day for a month and requiring the deployment of two Dakota squadrons from RAF Waterbeach to Wunstorf under the codename Operation KNICKER.²¹ These measures were designed to support the military garrisons, not the city's population. The Soviets read the wrong lesson, concluding on 17 April that '[US] attempts to create 'an airlift' connecting Berlin with the Western zones have proved futile. The Americans have admitted the idea would be too expensive.'²²

On 5 April there was a significant incident in the air when a Soviet Yak fighter performing aerobatics close to Berlin collided with a British European Airways civil Viking airliner which was making its approach to land at Gatow. Both aircraft plummeted to the ground and all those on board perished. General Robertson immediately ordered fighter escorts for all British transport aircraft and visited Sokolovsky to protest. The Marshal implausibly suggested that the Viking had struck the Yak whereas the former had been

* British Air Forces of Occupation subsequently changed its title to the more familiar Royal Air Force Germany, though it remained BAFO throughout the Airlift.

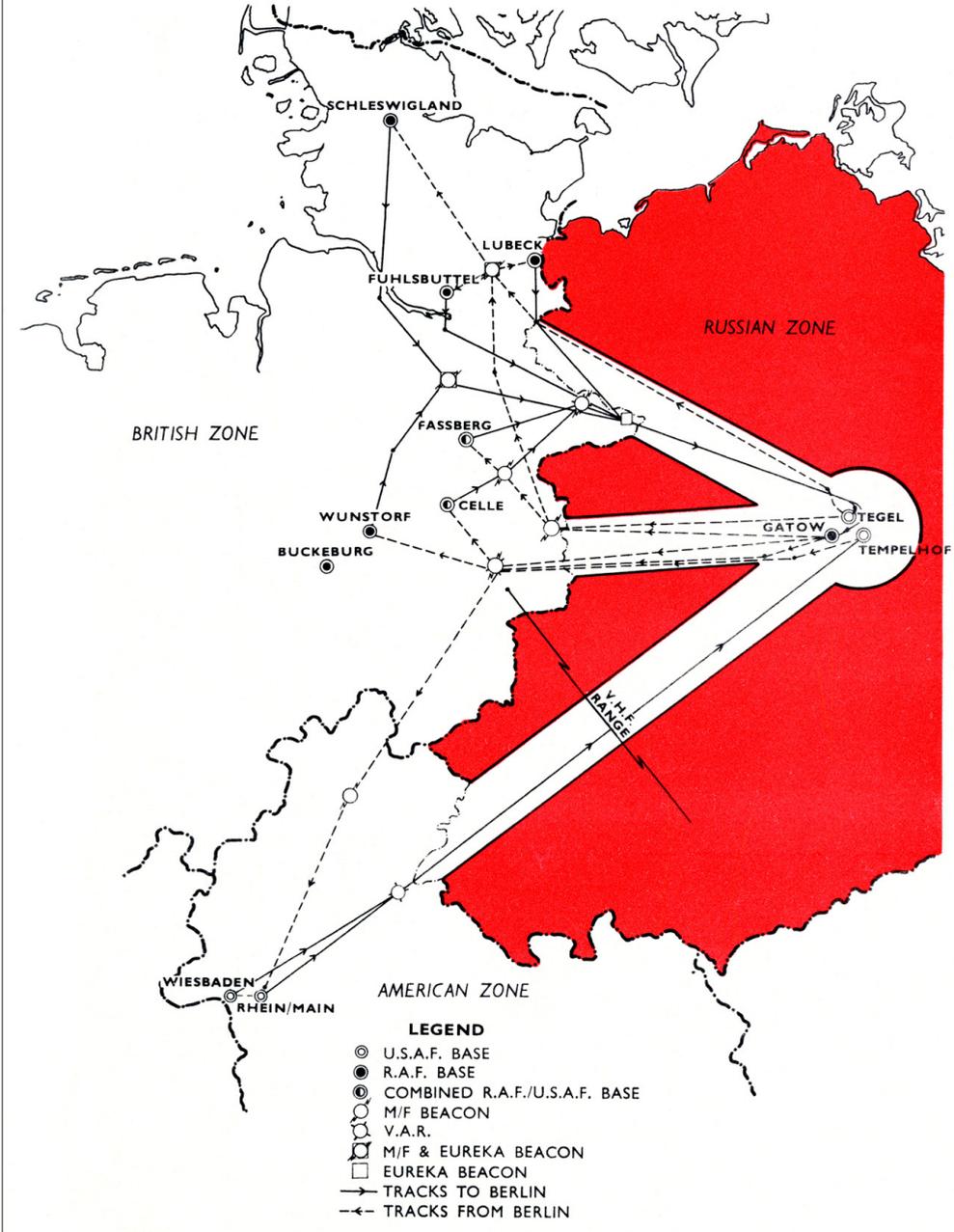
struck from below and behind, severing its right wing. Though firmly sticking to their narrative of blame, the Soviets were also perceived to be anxious to have the incident seen as accidental. Whilst harassment of aircraft in the corridors was to continue or even intensify during the later airlift, it was generally conducted with greater care and competence and no further collisions were to occur. The resolute Allied response, with US General Clay following Robertson in ordering fighter escorts, was thought by some to be crucial in persuading the Soviets that, whilst they might harass, bringing an aircraft down would potentially be a *casus belli*.²³

The accident involving the Viking, whilst serious and having implications for the future, was a distraction from the main political events in April. These were to precipitate a full-blown blockade by the Soviets and turn a difficult situation into a major international crisis. Following from the decisions taken at the London Conference, the British and Americans moved to implement the currency reform, printing the new notes, and notifying the Soviets on 18 June that “west” marks would be introduced in the Western zones of Germany, but **not** Berlin, on 20 June 1948. The Soviets immediately perceived the threat to their own position, hastily modified their own occupation currency with *applied* postage stamps and announced that only this currency would be accepted in Berlin. Meanwhile the blockade measures on rail and autobahn were further tightened with all surface transport from the West into Berlin effectively halted from 24 June. That same day, at the instigation of General Robertson, HQ BAFO ordered the implementation of Operation KNICKER. His message to the RAF was simple, ‘Something must be done and something must be done at once.’ Foreign Secretary Ernest Bevin’s exhortation was even pithier ‘Do your best’.²⁴ As one RAF staff officer present at the time remarked later, ‘...something at once and do your best is hardly the way to start a staff exercise, but that was the direction we had.’²⁵

General Clay had initially favoured attempting to force a military convoy through to Berlin, but Robertson visited him on 24 June and made clear that this action would mean war with the Soviets and that the British would not support such a move. Robertson had an alternative suggestion. Air Commodore Rex Waite was the director of the Air Branch of the British Control Commission for Germany (the *de facto* government in the British Zone) and had done some very rough calculations which suggested that an airlift could support the entire city for a short period of time. Robertson put Waite’s proposal to Clay, who demurred, but the US Governor found the next day he had no support from Washington for his military plan and when he met with Berlin mayor Ernst Reuter later on 25 June, for lack of something better, he told Reuter that he would go with the proposal to feed the city by air, though he thought it a crazy scheme.²⁶ Bevin’s determination not to be ousted from Berlin, Waite’s “back of a fag-packet” calculations, Robertson’s demand for “something to be done”, and Clay’s lack of an alternative acceptable to his superiors therefore coalesced into support for the idea of an airlift that went beyond merely sustaining the garrisons. Nevertheless, it is clear that in essence, at the start, this more

OPERATING ROUTES OF THE AIRLIFT

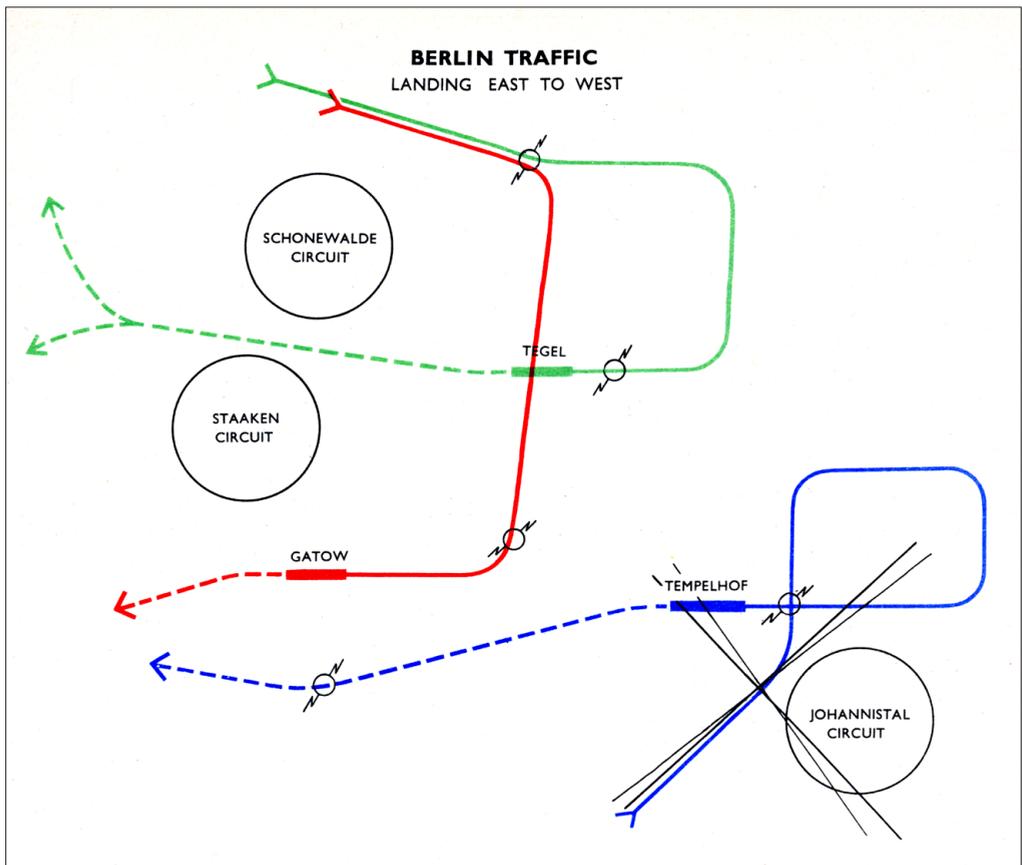
(This chart should be studied in conjunction with the Altitude Separation Chart on page 23.)



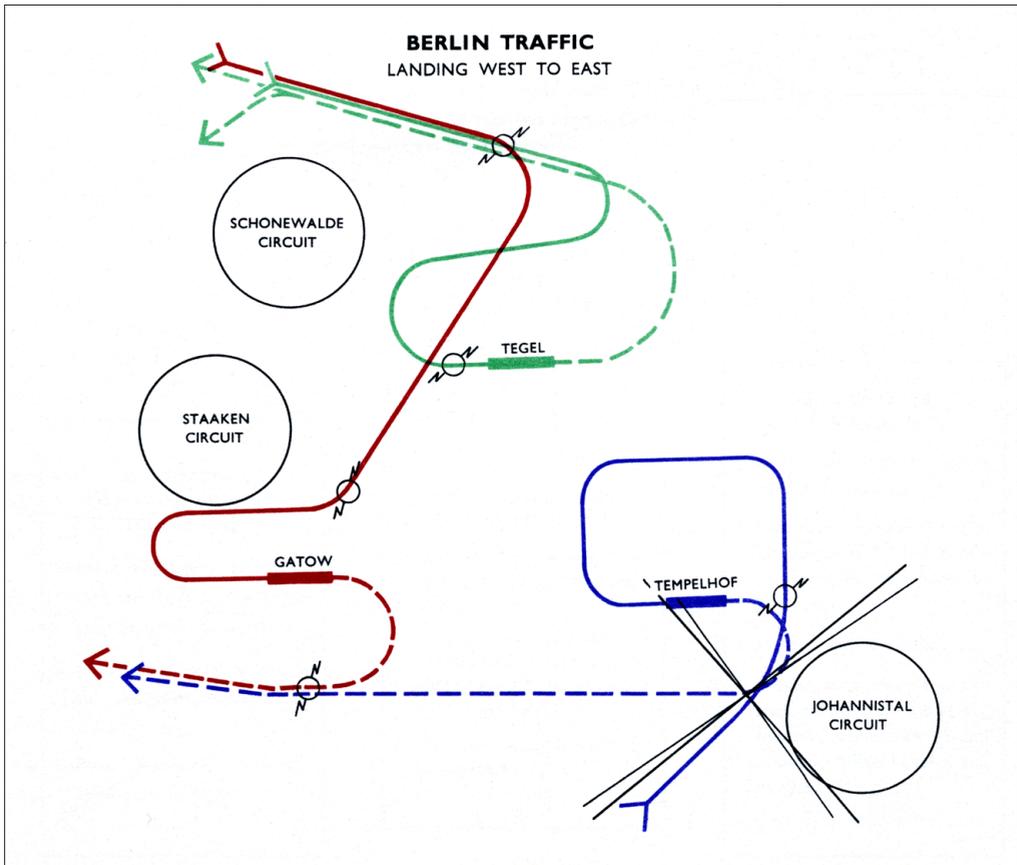
Operation PLAINFARE operating routes.

than somewhat *ad hoc* operation was simply intended to buy time whilst a political solution to the problem was worked out with the Soviets.

In one of those peculiar happenstances of history, on 25 June, more or less as Clay spoke with Mayor Reuter, the only RAF air transport squadron in Germany left the country and flew back to England! The Dakotas of 30 Squadron had been involved in an exercise with the Parachute Regiment which had just finished and so, as planned, they ate lunch and departed from their German base at Schleswigland for their base in the UK. Meanwhile, at almost precisely the same time another Dakota squadron took-off from RAF Waterbeach and headed in the opposite direction to Wunstorf. Three of their number made the first lift of a meagre 6.5 tons into RAF Gatow in Berlin that evening.²⁷ At midnight on 27 June, 46 Group ordered a second Dakota squadron to deploy to Germany as soon as possible and the squadron left Waterbeach for Wunstorf on the morning of 28 June.²⁸ Each squadron had eight aircraft. To set that in context, the daily requirement of food alone was 900 tons of potatoes, 641 tons of flour, 106 of meat and



Berlin Air Approaches landing East to West.



Berlin Air Approaches landing West to East.

fish, 51 tons of sugar, 32 of fat, 20 of milk and so on, amounting to around 2,000 tons per day. This did not include other essentials such as the daily requirement for 1,650 tons of coal to power West Berlin's power stations, or the fuel for the vehicles. The capacity of a Dakota flying into Berlin from the West was 2.5 tons.²⁹ The figures simply did not stack up. The Americans had 100 such aircraft in Germany but still the figures did not add up. Shortage of aircraft was only one element of the equation.

In Berlin itself there were only two functioning airfields. RAF Gatow, the former *Luftwaffe* base, had one pierced steel plank (PSP) runway of 1,500 yards. This was designed for use on temporary airfields constructed during the war, and used mostly by single-engined aircraft of at the most Dakotas, and was certainly not intended for high intensity operations solely by heavily laden transport aircraft. A 2,000 yard concrete runway and taxi-track was under construction, but in June 1948 a shortage of materials (it being in the Soviet Zone) meant it was only three-quarters complete: it was put into use anyway and was completed on 16 August. The PSP runway was also renovated and extended to

2,000 yards.³⁰ The airfield in the US Zone was Tempelhof, which had some impressive Nazi-era terminal buildings with seven subterranean levels, but the 5,000 foot runway was also PSP. The approach to Tempelhof was also difficult, with aircraft passing a seven-storey block of flats, and pilots describe breaking cloud to find themselves peering into people's living rooms. Both airfields had new runways added and existing ones improved and extended.³¹ At the other end of the air corridors, the RAF base at Wunstorf had concrete runways and hardstandings, but these proved insufficient when more aircraft arrived. Lübeck likewise had a concrete runway which had to be extended as were the existing hardstandings. The American bases at Wiesbaden and Rhein-Main had runways of 5-6,000 feet originally, but likewise lacked other facilities. All these airfields were subject to massive reconstruction works to extend and improve facilities, especially aircraft hardstandings, and in some cases additional runways. Other airfields at Celle, Fassberg, Fuhlsbüttel and Schleswigland were also brought into use and improved and developed as the airlift progressed. In Berlin an entirely new airfield, with a runway built of compressed rubble (of which there was an inexhaustible supply) bound with asphalt was constructed at Tegel in the French Zone. Elsewhere new bulk storage, railway sidings and other airfield facilities were also built including six 12,000 gallon storage tanks and pumping facilities at Wunstorf.³² Not the least of the Airlift's many achievements were these remarkable feats of engineering undertaken against an urgent requirement, often with inadequate equipment, and often whilst the airfields continued to operate around them.

As the Allies began to react to the new political and military situation aircraft began to fly into Germany from Britain and around the globe. The decision to expand Operation KNICKER was approved by the Cabinet on 28 June and saw it renamed Operation CARTER PATERSON, the name of a well-known UK removals firm of the era, but proved a gift to Soviet propagandists who quickly implied that the name presaged a British withdrawal from Berlin. It was rapidly changed again to Operation PLAINFARE.³³ The Chief of the Air Staff, briefing senior colleagues on the day the Cabinet met, stated that the RAF was capable of lifting 75 tons per day into Berlin and that extra aircraft due to arrive in Berlin in the next two days would raise the total to 450 tons, and that would rise to 750 tons from 3 July when repairs to Gatow's runway were completed. The initial plan was to deploy 54 of the 112 Dakotas in RAF service to Germany. These would then reduce to 32 aircraft, to be replaced by Avro Yorks with a greater load carrying capacity of 7.5 to 8.25 tons. The aim was to achieve a capability for lifting 840 short tons by 7 July (1 short ton equalled 2,000lbs).^{*} By 30 June the original 16 Dakotas at Wunstorf had been joined by a further 38 aircraft, including the returnees of 30 Squadron.³⁴

Unsurprisingly perhaps, not all went entirely smoothly at first, especially in Germany. Wunstorf was soon crowded with aircraft which overflowed from the relatively restricted hardstandings and aprons onto the grass airfield. Unseasonably poor weather, with persistent heavy rain, meant the constant movements of aircraft and particularly vehicles turned the airfield into a sea of ankle-deep mud. The damp penetrated aircraft

^{*} All tonnage figures given in this article are in short tons.

electric systems causing serious serviceability problems with 22 Dakotas at Wunstorf unserviceable on 3 July. A shortage of bowzers coupled with a single bulk fuelling point, along with a serious lack of ground handling equipment from wheel chocks to trolley-starters, exacerbated the problems.³⁵ There was also initially a shortage of labour to load and unload the aircraft, a problem not helped by the Treasury's refusal to fund the transfer by air of a Royal Army Service Corps company to accompany a deploying Dakota squadron: the soldiers were sent by sea and rail.³⁶ The officer in charge of Wunstorf's transport wing noted in his diary on 3 July that the British Army could not cope with the increased aircraft numbers.³⁷ The first Yorks had arrived at Wunstorf on 1 July with further aircraft scheduled on successive days, but the ground handling issue, and the state of the airfield led to a decision to postpone the deployment of the last twenty Yorks. Feverish work over the next two days saw several ditches filled and some of the parking area covered with PSP and arrangements were then put in place for the remaining aircraft to deploy on 4 and 5 July.³⁸

As with the British, it was the American C-47s in Germany that shouldered the burden initially, but on 27 June Lieutenant General Curtis Le May, commanding United States Air Forces in Europe (USAFE) requested the immediate deployment of a Group of Douglas C-54 Skymasters to Germany. Like the York, the Skymaster had a greater load-carrying capacity than the C-47, being able in theory to lift thirteen tons of cargo, although generally it was restricted to ten tons during the airlift to conserve brakes and tyres during the repeated landings. As there was little in the way of maintenance support for the C-54s in Germany they were to bring groundcrews and spares with them.³⁹ The first C-54 touched down at Rhein-Main airfield on 1 July and by the next day seventeen aircraft had reached the base with more to follow from around the globe. They began to replace the C-47s which returned to their bases, although their crews remained to fly the C-54s.⁴⁰ Le May, who flew a C-47 into Berlin in late June to better see the operation for himself, appointed Brigadier General Joseph Smith as the commander of the US airlift, now codenamed Operation VITTLES. It was Smith and his staff who instigated the "block system" whereby the different aircraft types operating on the air lift were allocated time slots with the bigger C-54s flying first, departing at four-minute intervals. Four minutes after the last C-54 took-off, the first C-47 would follow. In the air the aircraft were stepped up between five and ten thousand feet in steps of 1,000 feet.⁴¹ The Americans too experienced some initial problems. As with Wunstorf, the rain and constant movement churned up the grass surfaces at Rhein-Main, which quickly became known as "Rhein-Mud". At Tempelhof, the constant shuttle of C-54s soon caused the runway surface to begin to disintegrate under the pounding it received, and Smith asked for permission on 9 July to begin building a new runway, which meant using some of the available lift to fly in some of the construction material.⁴²

The southern corridor was also longer than the northern route from the British Zone, so Smith asked Group Captain Kenneth Cross, Group Captain Operations at BAFO, for

permission to relocate some C-54s to the British Zone in Germany.⁴³ A new runway had been built at Fassberg and some of the Dakotas from the overcrowded airfield at Wunstorf had moved there in July, but following Smith's request to Cross these were moved again to Lübeck, and C-54s moved in to take their place and utilise the shorter northern route, allowing them to fly more sorties per day. The first C-54s arrived at Fassberg on 20 August and PSP hardstanding was constructed sufficient to accommodate sixty-five C-54s of the 65th Troop Carrier Wing.⁴⁴

Fassberg thus became an RAF Station under the command of an American officer, an arrangement which was to become familiar in the UK during the Cold War at bases such as RAF Mildenhall. It did not, however, start well. The Americans were appalled by everything from the beds to the food, which was apparently kippers, fried tomatoes and overcooked sprouts and insufficient quantities at that, and the RAF forbade the Americans from drinking or gambling in their RAF quarters, whilst the NAAFI would not sell them whisky as it was bonded and only for sale to British servicemen. The first three USAF commanders rotated in and out at bewildering speed with the last of the three communicating only in writing with Group Captain Biggar, the senior RAF officer. His replacement was Colonel John Coulter, a man possessed of far greater diplomatic skills, and it was he who persuaded the RAF to give him effective control. He was also possessed of a wife with film star good looks, mainly because she was indeed a famous film star, Constance Bennett. Unlike so many of that breed, however, she had the human touch and no "airs and graces". She was cheerful, despite the spartan surroundings, high-spirited and, according to a USAF General, "no mean scrounger". She astounded the RAF wives by using a standard "service issue brown earthenware slops basin as a suddenly chic salad bowl." A PX was opened, supplies of US whisky found, and facilities improved, if only a little, but morale definitely improved.⁴⁵

The RAF found one novel way of sidestepping the problem of airfield capacity. On 4 July, two squadrons of Sunderland flying boats landed on the waters of the River Elbe at the old Blohm and Voss works at Finkenwerder in Hamburg.⁴⁶ The next day they flew their first sortie into Berlin, carrying three and a half tons of spam, and landing on the River Havel near Gatow.⁴⁷ Although they did not require airfield facilities at either end of the lift, the Sunderlands had their own problems. The Elbe at Finkenwerder was littered with wartime wrecks and obstructions, many of them unmarked, the waters of the river were usually rough and the aircraft had to be loaded from small boats, which was time-consuming. The aim was to fly three missions per day which represented six hours in the air, plus loading and refuelling time which made for a long day. The lack of approach aids and navigation equipment for the flying boats also hampered their operations.⁴⁸ In theory, the Sunderlands could carry up to 10,000lbs of freight. They were used to carry a variety of goods into Berlin including salt, meat, sanitary towels and cigarettes, and then fly passengers and industrial goods in the opposite direction. The goods carried out included boxes of lightbulbs from the Siemens factory which filled the capacious fuselage but

posed no problems of weight or centre of gravity.⁴⁹ The carriage of salt was presumably on the basis that the hulls were anodised as better protected against salt water, but in fact that only applied to the fuselage or exterior not interior, though the control cables did run along the roof of the aircraft and not along or beneath the floor.⁵⁰ Two Short Hythes, the civil version of the Sunderland, joined the lift flown by Aquila airways. The Sunderlands and Hythes were withdrawn from the airlift in December because the rivers were icing up, but in any case, there were problems trying to fit them into the block scheme. In all, the big flying boats lifted 6,709.5 tons of goods into Berlin, 5429.5 by the Sunderlands and the balance by the Hythes.⁵¹ The flying boats did perform one other valuable service, which was considerably to improve the morale of the Berliners, who would flock to the banks of the Havel, especially on Sundays, to watch the big birds alight gracefully on the water.⁵² The Soviets protested that these activities were conducted outside the quadripartite agreement, in which they may well have been correct, but the British simply ignored them.⁵³

There was still a need for more aircraft and crews and the British began to contract civil airlines to assist. At first the focus was on the need to transport liquid fuel. Attempts had been made to carry fuel in 55 gallon drums but each weighed 365lbs and they were bulky and not easily secured in the aircraft, making transporting them hazardous.⁵⁴ The solution was tanker aircraft, but at the time the RAF possessed none. However, one British aviation pioneer had entered the field. Sir Alan Cobham had formed *Flight Refuelling Limited* specifically to investigate the art of refuelling in the air, but his Lancastrian (modified Lancaster) tankers were now required not to refuel others whilst flying, but to carry fuel to be discharged in Berlin. The first Lancastrian flew direct from Tarrant Rushton to Berlin on 27 July 1948. A second Lancastrian arrived and the aircraft initially operated from the airfield at Buckeburg but moved to Wunstorf on 27 July and most “wet” lift subsequently flew from Wunstorf or Schleswigland.⁵⁵ The latter did have a Luftwaffe system for pumping fuel but it was relatively slow and, although a modern facility was built at Wunstorf capable of rapidly fuelling twelve aircraft, it was not completed until April 1949. In Berlin initially the fuel was offloaded at Gatow into underground tanks and then pumped to barges on the Havel and moved to Berlin. Later Tegel was also used. The offload at Gatow was through gravity feed and, depending on the aircraft type, could be slow. Eventually the civil “wet” lift consisted of 14 Lancastrians, seven Tudors, 17 Halifaxes/Haltons and two Liberators capable of lifting 550 tons per day.⁵⁶ Nevertheless, in the winter of 1948 fuel stocks became dangerously depleted. The target had initially been set at 220 tons per day but the average had been only 128 tons and in November the city would have run out of fuel if the Allies had not resorted to the simple expedient of purloining Soviet stocks which happened to be stored in the Western Zone!⁵⁷

It was not only the “wet” lift which employed civil aircraft. A series of contracts were also let to other civil operators, some with just one or two aircraft, and the first of these

arrived at Wunstorf on 4 August. A Handley Page Halton (a converted Halifax bomber) of Bond Air Services flew the first sortie into Berlin at 0300 hours and this aircraft flew five return trips in the next twenty-four hours. There were problems integrating the hotch-potch of civil aircraft types into the lift, exacerbated by the fact that they lacked sophisticated navigation aids and had radios operating on the wrong frequencies. Many of the firms also ran on shoestring budgets and had few groundcrew and lacked spares, so resorted to scrounging both from the RAF whenever they could, though their unserviceability rate remained generally high.⁵⁸ The Number 46 Group Report, having listed all the maintenance facilities and equipment provided to the airlines, commented drily: “It is submitted ... that Civil charter companies cannot be regarded as entirely self-supporting from the engineering point of view...”. Indeed so.⁵⁹

Many, if not most, of the civil aircrew were ex-RAF and some would have flown over the city in military variants of the very same aircraft just four years previously, but with very much more hostile intent. In some respects, however, they may have felt little had changed. Especially during September, the Soviets chose to conduct military exercises along the fringes of the corridors and even above them, as formally under the quadripartite agreement they extended only to 10,000 feet. Amongst other activities, the Soviets conducted live anti-aircraft firing exercises alongside the corridor and fighters “buzzed” or flew in close formation on airlift aircraft. One anti-aircraft exercise continued for three hours but was only announced to the Air Safety Centre one hour after it commenced. At night they also shone searchlights into the eyes of pilots on approach, especially at Gatow. ‘No less than fifty-five airlift aircraft recorded hits by Soviet ground fire’, though none was ever shot down. The RAF did not apparently keep a record of incidents although the USAF did, recording 733 occurrences of harassment of various sorts in the corridors between 10 August 1948 and 15 August 1949. Eleven of the 733 incidents are recorded as “balloons” but precisely what type of balloon or their exact method of use is not recorded in the USAF list; they may have been released as free balloons such as those used by meteorological staffs for recording upper air data.⁶² The Soviets reportedly flew barrage balloons above their airfields at Kothen, Dalgow and Brandenburg at some point, though how sustained this activity was is not clear.⁶³ Allied aircrews were certainly fearful that the Soviets would deploy barrage balloons on the airfield approaches in Berlin but they did not, ‘possibly because it would have been difficult to claim that a collision with a tethered balloon on the approach to an airfield was the fault of the pilot!’⁶⁴

The last of the RAF aircraft deployed on the airlift were the brand new Handley Page Hastings which arrived at Schleswigland on 1 November shortly after the airfield had been reopened as an Operation PLAINFARE base for civil aircraft. The Hastings crews started hauling coal on 11 November, thus quickly coating their shiny new aircraft, and indeed themselves, with a fine layer of coal dust. ‘Coal dust was particularly insidious. It covered not only the occupants with its soot but also worked its way into instruments

and corroded electrical wiring. Both coal and flour dust swirled around the inside of an aircraft during flight and both could be explosive under the right conditions.⁶⁵ Though it could lift some eight tons, and accommodate awkward loads like large girders for Berlin's power station, the Hastings, unlike the nose-wheel configuration of the C-54, was a "tail-dragger" and awkward to handle in any sort of crosswind.⁶⁶ Its configuration also meant pushing loads uphill through the length of the fuselage.

The early days of airlift operations were very much an *ad hoc* affair such that it was not, in truth, planned in detail. In the early days both in the American and British lifts it was often a case of an aircraft was ready and loaded and a crew was found to fly it. Squadron Leader Johnstone of 30 Squadron brought seven Dakotas into Wunstorf from Oakington but no-one marshalled them in, and finding nobody to direct him on what he was to do next, he went to Station HQ seeking answers. "Every corridor and stairway seemed alive with harassed blue-clad pilots vainly seeking instructions, 'like Victoria Station in the rush hour'".⁶⁷ One Australian officer, Wing Commander Norman Lampe, was an experienced transport pilot, but was officially a staff officer at Royal Australian Air Force Headquarters when he was sent to England on temporary duty in July 1948. He somehow contrived, almost certainly without higher authority, to get to Germany and fly five sorties out of Wunstorf in August.⁶⁸ Wunstorf was officially home to 123 Wing, a fighter-bomber Wing equipped with Vampires and Spitfires which were flown out between 22 and 28 June to make room for the airlift. The domestic accommodation normally housed just over 900 personnel but Operation PLAINFARE increased it to over 2,000 without including civilian operators and at its peak there were 3,200 personnel permanently on site and another 1,000 present in the day. Initially crews bedded down where they could, with some sleeping in the Station Church and mattresses on floors or simply under or on desks. Attics in accommodation blocks and all the messes were pressed into use and eventually specifically converted to provide more bed space.⁶⁹ It was a similar picture on the American side. Pressure to fly was intense and normally desk-bound staff officers were pressed into flying missions.⁷⁰ However, this type of frenetic but somewhat unstructured activity inevitably led to increasing fatigue amongst aircrew, particularly when they were getting no proper rest.

In large part this was the inevitable result of a largely unplanned operation thrown together at the last minute with increasing resources thrown at it, but little in the way of long-term planning, not least because no-one initially thought it would last more than a few weeks. The command and control arrangements reflected this. On the British side, Group Captain Noel Hyde, Station Commander at RAF Waterbeach, received a formal directive from his Group Commander at 46 Group on 30 June appointing him 'to command the Transport Command Force detached within British Air Forces of Occupation (Germany)'. He was to 'operate under the control and direction' of the AOC-in-C British Air Forces of Occupation (BAFO).⁷¹ When he reached Wunstorf, the Station Commander and Group Captain A J Biggar (an officer on BAFO staff) told him BAFO had made them

“directly responsible for all transport operations”. Group Captain Cross arrived from Air Headquarters (AHQ) BAFO on 1 July and told Hyde he was to be responsible to the Station Commander Wunstorf and the latter was to report to Group Captain Biggar who would be forming a skeleton HQ at Wunstorf and given acting air rank. On the basis of his own directive, Hyde demurred but said he would co-operate in the interests of the operation until a ruling came from Transport Command. Hyde and Cross visited AHQ BAFO where the Senior Air Staff Officer (SASO), Air Vice-Marshal Spackman, told Hyde his directive from 46 Group stood, that he was not to be responsible to the Station Commander, and that Biggar was to be regarded as a forward staff officer attached to the Army Air Transport Organisation at Wunstorf although details of work to be carried out would come through him. This was itself hardly a crystal-clear chain of command, but when Hyde returned to Wunstorf from AHQ, Biggar and the Station Commander stated that Group Captain Cross had telephoned and re-stated that they were in command. Farce followed farce as the AOC-in-C visited Wunstorf on 2 July and reiterated the C2 arrangement outlined by Air Vice-Marshal Spackman, only to issue a contradictory Operation Instruction 14/48 the following day.⁷² This stated that a BAFO Advanced HQ had formed at Wunstorf (though it didn’t say when!) and that the Officer Commanding (Group Captain Biggar) ‘is to exercise operational control of the Transport Forces allotted to him by Air Headquarters BAFO. This he will do through the Officer Commanding, RAF Station Wunstorf, who will in turn exercise control through the Officer Commanding the RAF Transport Wing located at Wunstorf.’ It added that Hyde was to ‘command the transport aircraft under the direction of the Officer Commanding, RAF Station Wunstorf.’⁷³ A more convoluted chain of command would be hard to imagine.

The underlying problem here was that BAFO’s operational element consisted almost entirely of tactical-fighter bomber and reconnaissance squadrons. There was a distinct lack of expertise relating to transport operations which did not normally impinge on their daily life, and this was reflected in the officers serving in senior positions in the AHQ. The C-in-C, Air Marshal Sanders, had spent the early part of the Second World War as Director Ground Defence in the Air Ministry then went to Bomber Command; the SASO, Air Vice-Marshal Spackman, had been in air defence throughout the War; and Group Captain Kenneth Cross had enormous wartime experience in the realm of fighter and tactical air operations but not air transport. BAFO clearly felt that, as the operation was taking place within their area of responsibility, they should control it, which was understandable, but they also appear to have recognised that they did not necessarily possess all the right expertise. In attempting to square that circle, they appear to have acted initially on the premise that they were simply temporarily moving Wunstorf’s tactical wing out and replacing it with a transport wing which would then function through the normal chain of command via the resident station commander with the incoming transport force operating under him. Whether they expected a transport-qualified Group Captain to accompany the Transport Force deployment is a moot

point, but, if they did, they clearly assumed he would be subordinate to their station commander. They then further complicated matters by inserting their own “Advanced HQ” at Wunstorf under Group Captain Biggar, which was to form part of a wider joint organisation set up in conjunction with the British Control Commission for Germany and the British Army of the Rhine to be known as the Combined Army/Air Transport Organisation [CAATO] which was clearly intended to co-ordinate the Army and RAF effort in support of the airlift. As the BAFO Report candidly admitted, ‘Under this organisation the Station Commander Wunstorf was responsible for operations to a Group Captain appointed to the staff of CAATO. In effect, this meant that three Group Captains were located at Wunstorf, each having a responsibility for operations.’⁷⁴ However, it would seem from Hyde’s report of his conversation with Cross that Biggar had arrived at Wunstorf in advance of the creation of CAATO and this added further confusion. The evidence from Hyde, quoting Cross, was that there was initially some intention to give Biggar acting air rank, but this never seems to have happened, perhaps because the head of CAATO was an Army Brigadier! Meanwhile, Transport Command, recognising the size of the force they were deploying, sent a transport force station commander, the unfortunate Group Captain Hyde, with his own directive to exercise command over the deploying squadrons. Again, *per se*, not an unreasonable move when ninety-four Transport Command aircraft from sixteen squadrons and two OCUs were deploying to mount what was an entirely air transport operation.

Thus, thrown into the mix were: a high profile, politically-charged, fast expanding multi-national operation for which there was no precedent; an HQ lacking experience and expertise in mounting transport operations but conscious the operation was in their area with the potential to go “hot” at any moment; a desire by the resident HQ to exercise tight control; and a more distant HQ owning the assets and the operational expertise. All of which led to the plethora of group captains and conflicting directives and instructions, some emanating from the very same headquarters. Add in the normal confusion endemic in fast-moving situations and the muddle is more understandable, although AHQ BAFO did not come out of the early period with its reputation greatly enhanced. Hyde, who must have been immensely frustrated and was clearly under intense pressure to ensure that the operation got under way promptly and effectively, appears to have exercised great tact and forbearance in the circumstances, accepting the unsatisfactory C2 arrangement temporarily in the interests quite literally of getting the operation off the ground. Large numbers of ground crew were also deployed to support the Transport Force and the duplication apparent at the top of the C2 chain was mirrored lower down. At this level, however, the goodwill and flexibility exercised by Group Captain Hyde and his equivalents seems less apparent. Hence, ‘At Wunstorf in the beginning there were, in effect, two Technical Wings [and thus two Wing Commanders]. The local Technical Wing was not familiar with the types of aircraft in use nor the system of servicing. Neither part was prepared to merge with the other, with the consequence that there was no central co-ordination to enable the fullest use to be made of local

manpower resources.⁷⁵ This reluctance probably stemmed initially from the uncertainty over the length of the operation and the view that it would soon come to an end.⁷⁶

As the operation expanded and with it showing every sign of continuing it was recognised that the C2 was unsatisfactory and after discussion between BAFO, Transport Command and the Air Ministry it was finally decided that a new operational HQ should be detached from 46 Group and established at Buckeburg. The AOC 46 Group, Air Commodore J W F Merer, was appointed to command, and his directive charged him with the control and execution of PLAINFARE operations, including co-ordinating with the USAF and ensuring the most effective utilisation of aircrew, aircraft and maintenance personnel.⁷⁷ This HQ formed on 22 September 1948. In the event, as will become clear shortly, 46 Group was not destined to exercise unfettered control of the RAF lift. Many of the same sorts of C2 issues which had plagued the early British effort were replicated on the American side. Like BAFO, the overall USAF HQ in Germany, USAFE, under Lieutenant General Curtis LeMay, was tactically orientated. With the exception of the two C-47 Troop Carrier Groups, which in any case were rapidly withdrawn, USAFE, like BAFO, had no air transport assets. The majority of the C-54s deployed to the airlift belonged to a different command, Military Air Transport Service (MATS), a joint USAF/USN air transport organisation roughly analogous to Transport Command. LeMay was pleased when the USAF sent an experienced air transport expert from MATS, Major General William L Tunner, to take charge of the US airlift replacing USAFE's Brigadier General Smith.

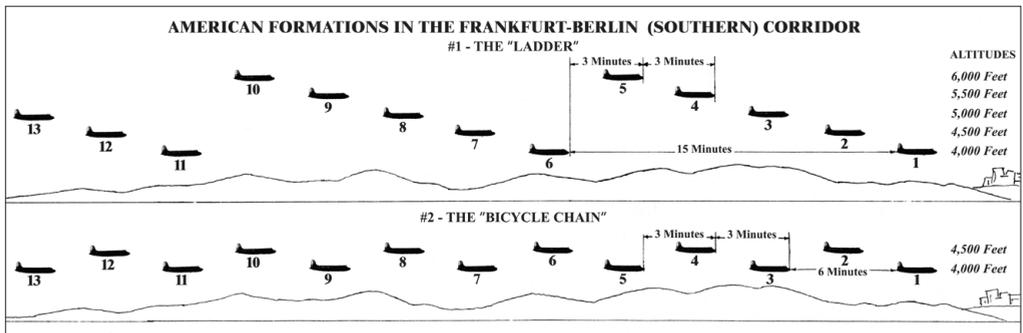
In the Second World War, Tunner had commanded the USAAF airlift over "The Hump", i.e. the Himalayas, from India and Burma in support of Chinese forces fighting the Japanese. He arrived in Germany on 28 July exactly one month into the airlift. His vision for an airlift was ordered efficiency with aircraft either flying, loading or unloading, or being serviced, and crews either flying or resting. Aircraft and crews standing around idle waiting for something or someone was anathema to him. 'Tunner's approach required the careful co-ordination of every aspect of the airlift, including detailed procedures and exact duplication and precise execution'.⁷⁸ Tunner, with LeMay's connivance, established direct communications with MATS and Air Material Command so that he could tap quickly into the resources in personnel, spares, and equipment he required. He and LeMay quickly became convinced that the American and British efforts should be merged under a single operational command, particularly once USAF C-54s began operating from the British base at Fassberg. The British, however, were initially determined to "run their own show" and were conscious that any combined organisation would inevitably have a US commander. LeMay worried away at the British, but got little joy from Air Marshal Sanders so tried going via Washington to London without success.⁷⁹

LeMay was forced at first to accept the British preference for a combined control centre at the Berlin end of the operation and this was established as the Joint Traffic Control Centre at Tempelhof which handled traffic into both Tempelhof and Gatow.⁸⁰

Eventually, with C-54s operating alongside a wide variety of RAF and civil types along the northern corridor and landing at both Tempelhof and Gatow the British were compelled to accept the logic of the US position. Sanders conceded the principle of combined control at a conference on 30 September, but the British then fell into arguing about its location which they wanted to be Buckeburg, arguing that the main effort in future would be from British bases.⁸¹ The Americans wanted Wiesbaden where Tunner's USAF airlift HQ was established, arguing, quite correctly, that there were not enough senior officers for two HQs and that dual-hatting would be best.⁸² The British finally accepted on 7 October and LeMay and Sanders signed a joint directive on 15 October establishing the Combined Airlift Task Force (CALTF) under Tunner with Air Commodore Merer as his Deputy. In fact the Americans were right. Essentially CALTF was Tunner's HQ rebadged. Merer was busy at his own HQ and only made the trip to Wiesbaden every two or three weeks. A handful of RAF officers were posted to CALTF including two or three operations officers, an air traffic controller and a signals officer. One important post, however, was that of Director of Plans and this was filled by Group Captain Noel Hyde who brought the same expertise combined with diplomatic skills he had shown at Wunstorf in the airlift's early days. He was, in Tunner's words 'a particularly welcome adjunct to the staff'.⁸³ Eighty-three USAF operations officers were posted to 46 Group's HQ at Buckeburg and co-ordinated the flights of the C-54s from Fassberg and later Celle. The British could be somewhat dismissive towards CALTF with BAFO concluding that the 'Combined Headquarters did not develop much beyond regulating the traffic flow into the Berlin airfields and co-ordinating their traffic pattern.'⁸⁴ In fact, of course, as Tunner appreciated, this was the very activity which was crucial to making the airlift successful.

We have seen how Brigadier General Smith introduced the basic "block" system on the airlift. Soon after his arrival, Tunner was to gain first-hand experience of another problem. He was flying on a C-54 into Berlin in August when the weather deteriorated with very low cloud and driving rain affecting visibility and the radars. A C-54 crashed, another burst its tyres braking to avoid the blazing wreck, and a third landed on an unfinished runway and ground looped. The controllers followed standard procedure and began stacking aircraft which soon saw a mass of aircraft milling around in very restricted airspace and poor visibility from 3,000 to 12,000 feet. Tunner quickly saw a bigger disaster looming (it was, of course, Friday the 13th) and radioed the controller himself and ordered him to send every other aircraft in the stack back to its take-off base.⁸⁵ From then on, any aircraft missing an approach was not slotted back into the circuit but flew back to its departure airfield to start the entire process again. A one-way system also funnelled all aircraft into Berlin airspace along the northern and southern corridors with all aircraft departing Berlin along the central corridor. Gradually much greater discipline was introduced into the airlift where, early on, corners had been cut, literally and figuratively. Crews who had been flying until they nearly dropped and snatching snacks were instructed that they could fly no more than two sorties without

a proper meal.⁸⁶ It became mandatory to follow a Ground Controlled Approach (GCA) and not fly a visual approach even in good weather.⁸⁷ RAF crews carried a navigator and better navigation aids and could fly the corridors to arrive to the minute at the Frohnau beacon, the reporting point at Berlin at which all aircraft reported and were identified and switched to the GCA controller who talked them onto the runway. USAF aircraft had no navigators and fewer aids, so tended to fly from Medium Frequency beacon to beacon using their radio compass and calculating time and distance.⁸⁸ The introduction of CPS 5 radar at Tempelhof with moving target indication made the identification and control of aircraft approaching Berlin much better and improved flying discipline still further.⁸⁹ In the southern corridor, where all aircraft were C-54s, the separation between aircraft in good weather was reduced to 500 feet in height and three minutes in flow rate. This pattern had five aircraft stepped up with the sixth aircraft at the same height as the first and fifteen minutes behind. In March 1949 this was changed to just a simple five hundred foot, three minute separation with only two height bands which made landing at Berlin simpler. With the many different aircraft types in the Northern corridor, all but the C-54s continued to operate the “block” system. There were a number of aircraft accidents during the airlift but only one mid-air collision and that occurred between two USAF C-47s very early on.⁹⁰



To allow as many aircraft as possible to fly into Berlin, the US Air Force developed a system called the “ladder”, which separated aircraft by altitude and distance.

The improvements in the air were mirrored by much greater organisation and efficiency on the ground. The logistics of delivering supplies to the airfields and the packing, loading and unloading of freight was an Army responsibility utilising large numbers of German civilians. The Army/civilian loading teams were always supervised by RAF Air Movements personnel who were responsible for the documentation and the lashing and weight distribution of loads. Backloading from Berlin in British aircraft was the sole responsibility of RAF movers. The Army/civilian loading teams were eventually organised into specific ten or twelve man teams under the same individual and an element of competition was introduced with rewards such as prizes of cigarettes or coffee given to the best teams. By the end of the airlift it took an average of 25 minutes to load a C-54 with a “standard” load of coal or flour.⁹¹ Aircraft marshalling on the ground at both ends of the airlift was

improved and systemised. Aircraft reported their loads as they approached Berlin and the unloading teams were waiting as the aircraft taxied in. Greater use was made of dried goods, for example dried potato and powdered milk which weighed a fraction of the “real” item. Coal, however, which formed a major part of the total lift, could not be reduced, though every scrap of coal dust was swept from the aircraft and aprons and compressed into briquettes. Coal sacks were supposed to be recycled but many just disappeared and others began to disintegrate. Over 1,300,000 sacks from Britain costing £12,500 had been supplied by the end of October.⁹²

The real concern came with the onset of winter. During November the weather worsened and fog at the bases became a particular problem and tonnages began to drop with the British lift falling from 1,000 tons a day in the previous month to just over 850, with the USAF showing a similar drop.⁹³ The Russians confidently believed that “General Winter” would come to their aid and defeat the Allies as he had done with Napoleon and Hitler. General Robertson himself doubted that the airlift could sustain the city through the winter and he was by no means alone, though General Clay was optimistic.⁹⁴ Clay was perhaps pinning his hopes on the US President approving his request for extra C-54s, and in late October President Truman came through and approved the transfer of an additional 66 of these most valuable aircraft.⁹⁵ But there were other positive factors too. The new airfield at Tegel in the French zone received its first aircraft on 18 November, after the French dynamited a Soviet-controlled radio station’s masts located on French territory on the approach!⁹⁶ Tegel formally opened on 1 December. RAF Hastings started operations on 11 November from Schleswigland, and C-54s moved into the newly opened RAF Celle on 15 December.⁹⁷ The C-54s authorised by the President began arriving with the last of them reaching Europe in January.⁹⁸ That month the daily average tonnage began to climb again, with the British lift again climbing above 1,000 short tons and the USAF nearly meeting 4,500.⁹⁹ The crisis passed and tonnages steadily climbed from March onwards. In April, Tunner staged what became known as “the Easter Parade”. His planners at CALTF published the daily quotas for each airfield for 16 April calling for a maximum effort and Tunner visited USAF and RAF bases to cajole and harry. The response exceeded his expectations with the lift delivering 12,849 tons in one day.¹⁰⁰

General Winter had failed. On 12 May 1949 the Soviets lifted the blockade. The Allies continued the airlift until September 1949, in part because they wished to insure against any sudden re-imposition of the blockade by the Soviets once it had wound down, in part to build up stocks in Berlin, and in part to demonstrate that they could maintain the airlift indefinitely if they chose.

The achievements of the airlift in statistical terms are impressive enough. The total tonnage lifted into Berlin by British and American aircraft was 2,325,808.7 tons. Of this, the British lift carried 542,236 tons split of which the RAF carried 394,509 tons. The Yorks carried the largest tonnage, 233,144.6 tons, with the Dakotas hauling just

over 100,000 tons and the Hastings some 55,000 tons, whilst the Sunderland managed some 5,400 tons. The British carried 241,000 tons of food, 165,000 tons of coal and 92,000 tons of wet fuel, all the latter in civil aircraft. They also carried 35,000 tons of freight, including 12,800 tons of economic goods, and 131,436 passengers out of the city. British aircraft flew more than 32 million miles, consumed over 35 million gallons of Avgas and spent over 200,000 hours in the air.¹⁰¹ They helped sustain a city of more than two and a half million inhabitants for many months including through the winter. Just as importantly, however, was that in the first real test of the Cold War they demonstrated immense western resolve in the face of Soviet provocation and intransigence and dealt a significant blow to Soviet prestige and influence with incalculable effects on Western European communist parties, particularly those in France and Italy. The western presence in Berlin was maintained and it remained as a beacon of freedom inside the Communist bloc, not to mention acting as a very useful centre for intelligence gathering. The airlift also demonstrated to a Service dominated by airmen from an offensive bomber and tactical air background that the RAF's air transport capability could be deployed as a strategic asset to considerable effect.

We should also recognise the Royal Australian Air Force, Royal New Zealand Air Force and South African Air Force crews who flew with the RAF on the airlift, as well as the civilian operators, many of them ex-RAF. Eighteen British Commonwealth servicemen died in the course of the airlift; fifteen RAF, one Royal Australian Air Force and one South African Air Force and one British Army sergeant. The civil lift suffered twenty-one fatalities. Thirty American servicemen and one civilian died, and six Berliners died in accidents on the ground and seven died when an RAF Dakota crashed near Lübeck.¹⁰² In comparison with the scale of the airlift and the difficulties involved, not to mention the potential casualties had the dispute turned "hot", these losses were astonishingly small.

All told, the RAF lifted in about seventeen per cent of the tonnage and the civil lift contributed six per cent, with the rest being carried in USAF aircraft. The reasons for this disparity are varied and are not simply down to the numbers of aircraft deployed. It was recognised that the most efficient aircraft on the airlift was the C-54 and thus these were given priority both in the block system, but more especially when the weather was bad and the rate at which Berlin could accept aircraft dropped, then RAF Dakotas were grounded in favour of flying C-54s from Fassberg or Celle. The British also accepted far greater responsibility for backloading goods and passengers out of Berlin. This meant longer waiting times on the ground in Berlin whilst aircraft were loaded, whereas the C-54's usually turned straight round to fly back empty. The British took the view that flying goods produced in Berlin out was important for the local economy, a view not shared by the Americans. Passengers did not always have a comfortable trip and could be idiosyncratic. One elderly lady was settled on some mailbags in the back of a Dakota and suffered a turbulent trip to Lübeck without complaint, but resolutely refused to board the "dangerous" truck waiting at the other end to take her to Hannover.¹⁰³

On 23 September 1949 at 1830 hours, a Royal Air Force Dakota took off from Lübeck and after making its way along the northern corridor and calling up Berlin overhead the Fronhau beacon it landed at Gatow fifty-two minutes after it took off. Emblazoned on the nose of the Dakota were the words “*Positively the last load from Lübeck, 73,705 tons. Psalm 21, Verse 11*”. If anyone on the apron had a bible to hand and turned to the quote they would have realised that the biblical reference was aimed squarely at the Soviets – *For they intended evil against thee; they imagined a mischievous device, which they were not able to perform.*¹⁰⁴

NOTES

¹ On the EAC’s proposals and policy differences among officials see Ann and John Tusa, *The Berlin Airlift*, (London, 1998) chapter 1 *passim*.

² *Ibid.*, p.48, and Air Historical Branch, AP3257, Headquarters British Air Forces of Occupation Report on Operation Plainfare p.20.

³ *Ibid.*, p.11.

⁴ Helena P Schrader, *The Blockade Breakers – the Berlin Airlift*, (Stroud, 2010), pp.9-10.

⁵ Air Historical Branch. Copy of station history by Squadron Leader R E Miller, A Bridge Yesterday – the story of Royal Air Force Gatow in Berlin, p.17.

⁶ Roger G Miller, *To Save a City – the Berlin Airlift 1948-1949* (College Station, 2000), pp11-12.

⁷ Tusas, p.59.

⁸ Quoted in *Ibid.*, p.24.

⁹ Quoted *Ibid.*

¹⁰ *Ibid.*, p.74.

¹¹ *Ibid.*, p.66.

¹² *Ibid.*

¹³ Miller, p.19.

¹⁴ Schrader, p.27.

¹⁵ The rampant inflation which affected the Weimar Republic inter-war ran into thousands of per cent and destroyed the savings of the German middle class and was in part responsible for the rise of the Nazi party. So searing were the effects that fear of inflation continues to exert a very strong influence on German financial policy to this day.

¹⁶ Diptel 434, Military Governor to Foreign Office, 20 March 1948, in Keith Hamilton (Ed), Documents On British Foreign Policy, Series III Volume VI, Berlin, document 5.

¹⁷ Quoted in Miller, p.19.

¹⁸ Diptel 494, Military Governor to Foreign Office, 31 March 1948, DBPO document 6.

¹⁹ Tusas, pp.107-8.

²⁰ Miller, p.21.

²¹ AP3257, British Air Forces of Occupation, A Report on Operation Plainfare, the Berlin Airlift, 25 June – 6 October 1949, p.5.

²² Miller, p.23.

²³ Tusas, pp. 115-7.

²⁴ Presentation by Air Chief Marshal Sir Kenneth Cross to the RAF Historical Society seminar on the Berlin Airlift. *Proceedings of the Royal Air Force Historical Society, Number 6, September 1989*, pp.53-4. At the start of the Airlift the then Group Captain Cross was Group Captain Operations in BAFO.

²⁵ *Ibid.*, p.54.

²⁶ Miller, pp.43-4.

²⁷ Sebastian Cox, Britain and the Berlin Airlift, *Royal Force Air Power Review*, Vol.7 No.1, Spring 2004, pp.28-9.

²⁸ AP3257, British Air Forces of Occupation, A Report on Operation Plainfare, Appendix B, Report by Group Captain N C Hyde, Officer Commanding Transport Force on First Three Weeks of Operations Knicker, Carter Paterson and Plainfare for period 27 June 1948 to 19 July 1948, p.117.

²⁹ Tusas, p.144.

³⁰ AP3257, British Air Forces of Occupation, A Report on Operation Plainfare, Appendix C, Report by Number 46 Group on Operation Plainfare, pp.148 & 151-152.

³¹ AP3257, British Air Forces of Occupation, A Report on Operation Plainfare, Appendix G, Combined Airlift Task Force [CALTF] Report, pp.324-7 and Schrader p.55.

³² AP3257, CALTF Report pp.323-327.

³³ Tusas, p.150.

³⁴ Cox, p.29.

³⁵ AP3257, Report by Group Captain Hyde, p.120-2

³⁶ Tusas, p.149. The Army were initially responsible for providing the manpower for loading the aircraft.

³⁷ Cox, p.30

³⁸ AP3257, Report by Group Captain Hyde, p.117.

³⁹ Miller p.55.

⁴⁰ *Ibid.*, pp.58-9.

⁴¹ *Ibid.*, p.60.

⁴² *Ibid.*, p.61.

⁴³ *Ibid.*

⁴⁴ AP3257, CALTF Report, p.323.

⁴⁵ Richard Collier, *Bridge Across the Sky*, (London, 1978) p.122 and Tusas, p.253.

⁴⁶ AP3257, BAFO report p.14 and Cox pp.31-2.

⁴⁷ Schrader, p.79.

⁴⁸ AP3257, Appendix C, Report by Number 46 Group on Operation Plainfare, p.140.

⁴⁹ Cox, p.32.

⁵⁰ Miller, p.155.

⁵¹ AP3257, BAFO Report, Appendix R, Statistical Summary, p.520.

⁵² Wolfgang J Huschke, *The Candy Bombers*, (Metropol, Berlin, 1999), p.86.

⁵³ Cox, p.32.

⁵⁴ *Ibid.*

- ⁵⁵ Tusas, p.179, and AP3257, No 46 Group Report, p.140.
- ⁵⁶ AP3257, Number 46 Group Report, pp.199-200.
- ⁵⁷ Cox, p.33.
- ⁵⁸ *Ibid.*, pp.32-3.
- ⁵⁹ AP3257, Number 46 Group Report, p.196.
- ⁶⁰ Cox, p.32-3 and Tusas, pp.248-9.
- ⁶¹ Schrader p.96.
- ⁶² Roger D Launius, *The Berlin Airlift: Constructive Air Power*, Air Power History, Spring 1989, p.18.
- ⁶³ Collier, p.95.
- ⁶⁴ Cox, p.33..
- ⁶⁵ Schrader, p.88.
- ⁶⁶ Tusas, p.254.
- ⁶⁷ Collier, p.146.
- ⁶⁸ Chris Clark, *Operation Pelican: The Royal Australian Air Force in the Berlin Airlift, 1948-1949*.(Tuggeranong, 1978), p.20.
- ⁶⁹ Air Historical Branch, RAF Wunstorf Folder, "RAF Wunstorf Interim Report on Operation Plainfare", p.9, n.d. circa August 1949, and Collier p.69.
- ⁷⁰ Tusas, p.150.
- ⁷¹ AP3257, Report by Group Captain Hyde, Appendix A, p.129, No 46 Group Directive dated 30 June 1948.
- ⁷² AP3257, Report by Group Captain Hyde, p.118.
- ⁷³ AP3257, Annexure 4 to Appendix A, to BAFO Report, p.110 AHQ/BAFO Operation Instruction 14/48, 3 July 1948.
- ⁷⁴ AP3257, BAFO Report, p.7.
- ⁷⁵ *Ibid.*, p.82.
- ⁷⁶ *Ibid.*, Number 46 Group Report, p.179.
- ⁷⁷ *Ibid.*, BAFO Report, p.8.
- ⁷⁸ Miller, p.91.
- ⁷⁹ *Ibid.*, p.101.
- ⁸⁰ *Ibid.*, pp.101-2.
- ⁸¹ AP3257, Number 46 Group Report, p.146.
- ⁸² Daniel F Harrington, *The Air Force Can Deliver Anything! A history of the Berlin Airlift*, (Ramstein, 1998) p.66.
- ⁸³ William H Tunner, *Over the Hump*, (Washington DC, 1985), p.210.
- ⁸⁴ AP3257, BAFO Report, p.19.
- ⁸⁵ Miller, p.115.
- ⁸⁶ Tusas, p.186,
- ⁸⁷ Miller, p.116.
- ⁸⁸ *Ibid.*, p.182-4.
- ⁸⁹ AP3257, BAFO Report, p.161.
- ⁹⁰ Miller, p.147.

⁹¹ *Ibid.*,

⁹² Tusas, p.243.

⁹³ AP3257, BAFO Report, Appendix R, Statistical Summary, p.519.

⁹⁴ *Ibid.*,p.162.

⁹⁵ Miller, p.161.

⁹⁶ Tusas, p.305.

⁹⁷ AP3257, Number 46 Group Report, p.147.

⁹⁸ Miller, p.163.

⁹⁹ AP3257, BAFO Report, Appendix R, Statistical Summary, p.519.

¹⁰⁰ Miller, pp.174-5.

¹⁰¹ Figures compiled from AP3257, BAFO Report, Appendix R, Statistical Summary.

¹⁰² Miller, p.187.

¹⁰³ Cox, p.37.

¹⁰⁴ *Ibid.*, p.25.

‘TIME IS NO LONGER OUR ALLY’ RAF BOMBER COMMAND, DETERRENCE AND THE TRANSITION TO WAR, 1955-62

By Mr Clive Richards

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Abstract: In the decades following the Second World War, successive British governments adopted a defence posture based upon deterrence. Prior to 1968, primary responsibility for delivering the UK’s nuclear deterrent was vested in RAF Bomber Command. However, the credibility of the latter in this role was dependent upon three factors: the ability to disperse and protect the bomber force in time of war, in order to complicate any attempt by an enemy to destroy it before it could be launched; the development of robust transition to war procedures; and the maintenance of a proportion of Bomber Command at a high state of peacetime readiness, capable of retaliating in the event of a surprise pre-emptive attack. This paper examines the measures put in place during the latter part of the 1950s and early 1960s to achieve these three objectives, and the degree to which they were implemented in practice during one of the Cold War’s moments of greatest danger – the Cuban Missile Crisis of October 1962.

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INTRODUCTION

Now...there is in existence a weapon of small bulk capable of being conveyed on to a distant target with inevitable catastrophic results. We can set no bounds to the possibilities of airplanes flying through the stratosphere dropping atomic bombs on great cities. There are possible developments of the rocket for a similar purpose. I understand that the power of the bombs delivered on Nagasaki may be multiplied many times as the invention develops. I have heard no suggestion of any possible means of defence. The only deterrent is the possibility of the victim of such an attack being able to retort on the victor. In many discussions on bombing in the days before the war it was demonstrated that the only answer to the bomber was the bomber. The war proved this to be correct. This obvious fact did not prevent bombing but resulted in the destruction of many great centres of civilisation. Similarly if mankind continues to make the atomic bomb without changing the political relationships of States sooner or later these bombs will be used for mutual annihilation.

So reflected Prime Minister Clement Attlee in a draft letter to President Truman, circulated to members of the War Cabinet committee established to consider the question of atomic energy – GEN 75 – for comment on 6 September 1945.¹ Just one month earlier, the first atomic weapon to be used in anger had detonated over the Japanese city of Hiroshima. Recent biographers have pointed to Attlee's conviction 'that the only way to respond to a nuclear attack was with a nuclear attack' and 'that belligerents would almost always use the most extreme weapon available'.² For Bew, his belief in 'the overriding importance of 'deterrence' to the future of British foreign policy' marked out Attlee as a man 'ahead of his time.' However, 'the conclusion that he drew from this was a depressing one. The only response to an atomic bomb on London – or the only deterrent – was the expectation that Britain would not let such an attack go unanswered'.³

Subsequent political leaders shared Attlee's 'brutally realistic assessment' that the security of the UK – and, indeed, that of the West in general – relied not only upon the acquisition of atomic (and, later, thermonuclear) weapons, but also upon the ability to demonstrate to any aggressor that these weapons would be used *in extremis*. For more than two decades, the duty of exercising this deterrent capability was shouldered primarily by the Royal Air Force. 'With the advent of air power as the dominant factor in war, its effect can be felt immediately by the people' stated the Air Officer Commanding-in-Chief (AOC-in-C) of RAF Bomber Command, Air Marshal Sir Hugh Lloyd, in his contribution to a special issue of the journal *Flight* published in July 1950 to mark that year's RAF Display:

We, as a nation, refrain from striking the first blow. Hence it is vital that we should be capable of immediate reprisal – a reprisal so devastating in its results as to

deter any enemy. But in the launching of it time is no longer our ally; there must be instant action, like that of a fire brigade.⁴

Lloyd's comments were followed by an outline of the activities of Bomber Command, in which the anonymous author emphasised that 'the best contribution to lasting peace' that those serving in the Command could 'make as individuals is to be highly efficient and fully prepared, for...the very existence of a powerful retaliatory striking force is one of the strongest deterrents to a potential aggressor.'⁵ However, at the very time that these words were written, Bomber Command lacked the means to deliver the devastating reprisal advocated by its AOC-in-C. The absence of atomic weapons from the Command's arsenal – together with the growing obsolescence of the Avro Lincoln and Boeing Washington piston-engined heavy bombers that (alongside the English Electric Canberra) comprised its comparatively meagre front line – were reflected in the Directive issued to Lloyd by the Air Ministry following his appointment in February 1950. Rather than striking vital centres within the USSR itself, this document focussed Bomber Command's activities in the event of war upon attacking 'those targets whose destruction will do most to reduce the scale of attack by land and air on Western Europe and the UK.'⁶ Lloyd was charged with ensuring that Bomber Command was



Yesterday's bomber: Boeing Washingtons of No 115 Squadron over the North Sea en route to the bombing range at Heligoland.

able 'to engage at short notice land and coastal targets within the effective radius of action of your forces':

Your principal effort is likely to be directed against targets within 250 miles of the RHINE so that full advantage can be taken of maximum bomb-loads and navigational aids to bombing. In view of the limited strength of your force, your aim should be to develop the utmost possible accuracy, thereby reducing the number of aircraft required to destroy each target.⁷

It was only later in that decade, with the entry into service of British atomic and thermonuclear weapons and aircraft capable of carrying them to targets deep in the Soviet Union (the Vickers Valiant, Avro Vulcan and Handley Page Victor – known collectively as the 'V-Force'), that Bomber Command would assume a central role in British strategy. In a memorandum relating to the Air Estimates for the 1955-56 financial year, the Secretary of State for Air stressed the need for 'the Royal Air Force together with the United States Air Force' to 'provide the main deterrent to aggression...by the threat of overwhelming nuclear striking power. The primary task which now confronts the Royal Air Force', this Command Paper continued, was 'to build up the "V" bomber force, with its nuclear potential, to a state of high efficiency and preparedness':

The next twelve months will see the "V" bombers beginning to come into service. But much more is involved than re-equipment with modern aircraft. We must select personnel of the highest quality and train them specially. We must provide the basis required in peace and war, bearing in mind that the "V" bomber force must be capable of completing its mission even though a surprise attack might first have been launched upon this country. We must perfect methods of operation which would ensure success however difficult the conditions.⁸

The retaliatory nature of Bomber Command's stance posed a fundamental issue – the danger of Soviet pre-emption. 'It should be obvious', US strategist Bernard Brodie contended in his 1959 RAND study *Strategy in the Missile Age*, 'that what counts in basic deterrence is not so much the size and efficiency of one's striking force before it is hit as the size and condition to which the enemy thinks he can reduce it by a surprise attack – as well as his confidence in the correctness of his predictions.'⁹ Brodie went on to stress that adoption of a deterrent posture 'dictates primary concern with the survival of a retaliatory force of sufficient size following enemy attack.'¹⁰ The notion that the airfields housing the RAF's own bomber fleet would be the primary targets of any Soviet nuclear assault was not lost on the British Government. In an assessment of 'The form and scale of attack to which the United Kingdom would be exposed in the event of general war', prepared in 1955, the Joint Intelligence Committee included the destruction of 'airfields from which nuclear attacks could be launched against the Soviet Union' as one of the

‘Enemy’s Aims within the United Kingdom’; the likely form of attack on these targets being an ‘A-bomb from aircraft at optimum height.’¹¹

It was expected, therefore, that if the V-Force was to function as a deterrent, it was essential that it be seen to maintain a credible second-strike capability. This paper will consider some of the difficulties inherent in establishing such a posture, and the steps taken by the RAF to overcome them. It will then go on to determine the success of these measures, as indicated by Bomber Command’s response to one of the most dangerous periods of the Cold War – the Cuban Missile Crisis.

AIR DEFENCE AND THE V-FORCE

One obvious method of ensuring the continued survivability of the V-Force in the face of a Soviet bomber attack was to shield it behind a stout air defence system. By the mid-1950s, the ability of the RAF to extend – and the UK to afford – an impenetrable air umbrella over the whole of the UK had come under serious question. One politician who ‘was exceedingly doubtful of the value of RAF Fighter Command in Britain, however valuable such squadrons might be overseas’ was the Chancellor of the Exchequer between December 1955 and January 1957, Harold Macmillan. ‘Everyone really knows’, Macmillan confided in his diary on 29 January 1956, ‘that there is *no* defence [against nuclear attack] yet we go on wasting immense [sums] on the design, development and production of ‘fighters’ – up to 1962 and further. This is a great burden on industry, as well as on the Exchequer.’¹² Macmillan continued to question the necessity of a manned fighter force on succeeding Eden as Prime Minister in January 1957. Following a restricted meeting of the Cabinet Defence Committee on 20 November 1957 to consider ‘what is Fighter Command for?’ Macmillan noted that ‘A huge sum of money is spent on it, but I don’t believe they could protect us from Russian bombers – at least enough w[oul]d get through to destroy the island’.¹³

The Prime Minister’s concerns with regard to the effectiveness of Fighter Command were shared, to a degree, by the Air Staff. A paper presented to the Air Council Standing Committee (ACSC) in June 1956 by the Vice-Chief of the Air Staff, Air Chief Marshal Sir Ronald Ivelaw-Chapman, conceded that the UK air defence system ‘would be incapable of preventing widespread devastation of the United Kingdom’. Nevertheless, this paper went on to argue that ‘The air defence of the United Kingdom forms an essential part of the deterrent’, for three reasons: ‘it provides the warning essential to prevent the enemy being able to destroy our striking force (and any units of the American striking force based in the United Kingdom) on the ground before they can strike back’; ‘it compels the enemy to devote considerable effort and resources to the development of a striking force capable of operating successfully in the face of it’; and ‘it could increase the time required by the enemy successfully to attack individual targets such as the airfields on which our striking force is based and thus make it even more difficult for him to destroy these forces before they could counter-attack.’¹⁴

The impossibility of guaranteeing that every Soviet bomber despatched to strike a UK target would be intercepted and destroyed was a key premise of one of the most controversial documents in the history of postwar British defence policy; 'Defence: Outline of Future Policy', a White Paper presented to Parliament in April 1957. From the outset, this document was linked inextricably to the politician chosen by Macmillan to serve as his first Secretary of State for Defence, Duncan Sandys, and it reflected the desire of both men 'to revise not merely the size, but the whole character of the defence plan.'¹⁵ With regard to the air defence of the UK, the White Paper was trenchant. 'It must be frankly argued', it stated,

that there is at present no means of providing adequate protection for the people of this country against the consequences of an attack with nuclear weapons, though, in the event of war, the fighter aircraft of the Royal Air Force would unquestionably be able to take a heavy toll of enemy bombers, a proportion would inevitably get through. Even if it were only a dozen, they could with megaton bombs inflict widespread devastation.¹⁶

Although it was clear from 'Defence: Outline of Future Policy' that Fighter Command would no longer be required to prepare for a second Battle of Britain, the text of the former nevertheless echoed to a degree the arguments advanced by Ivelaw-Chapman in favour of maintaining the UK's air defences, albeit on a much-reduced scale. 'Since peace so largely depends upon the deterrent fear of nuclear retaliation', the White Paper went on,

it is essential that a would-be aggressor should not be allowed to think he could readily knock out the bomber bases in Britain before their aircraft could take off from them. The defence of the bomber airfields is therefore an essential part of the deterrent and is a feasible task. A manned fighter force, smaller than at present but adequate for this limited purpose, will be maintained and will progressively be equipped with air-to-air guided missiles. Fighter aircraft will in due course be replaced by a ground-to-air guided missile system.¹⁷

For the Chief of the Air Staff (CAS) between January 1956 and December 1959, Marshal of the Royal Air Force (MRAF) Sir Dermot Boyle, the White Paper represented 'the most important and also far reaching event for the Air Force during my time as CAS'. Sandys 'rewrote the Defence White Paper overnight...and refused to listen to advice to the contrary', Boyle later recalled; 'I fought him in every legitimate way I could with very little effect, except that he finally agreed to the building of the TSR2, whose reconnaissance element had to be stressed, since he admitted that reconnaissance work could best be done by manned aircraft'.¹⁸ It has subsequently been criticised roundly by many in the UK military aviation community. 'To this day', Brookes observed in 2007, 'it is common for even senior RAF speakers to heap opprobrium

on Sandys and to imply that he tried singlehandedly to impose over-inflated policies on the RAF.’¹⁹

It is certainly the case that the White Paper had profound ramifications for RAF Fighter Command. While the Command’s control and reporting system was to be retained and reshaped to serve as ‘an effective warning system for the defence of the deterrent’, the number of fighters that it would control dwindled rapidly.²⁰ ‘Our fighter strength has already been considerably reduced’ the Secretary of State for Air, George Ward, reported to Parliament in his memorandum to accompany the 1958-59 Air Estimates, ‘and the planned rundown will be completed during the coming year. This smaller force of fighters will be needed to deal with manned aircraft, especially at longer range, to prevent reconnaissance, to investigate unidentified movements and to deal with the stand-off bomber and jammer, so long as these threats continue.’²¹ Between 1956 and 1958 the Command’s strength fell from approximately 600 aircraft, divided between 35 squadrons, to 320; this figure was further reduced to 272 in 1960 and 140 fighters operated by eleven squadrons in 1962. Moreover, ‘in 1957 all of the fighter squadrons of the Royal Auxiliary Air Force were disbanded, a further serious loss of strength and ability to deal with the unexpected.’²² During the 1960s, Bowyer has contended, ‘the roles of Fighter Command’s squadrons were of watch and ward in the aerial approaches to the United Kingdom, and a smaller but no less important forward reconnaissance capability, though the latter was mainly allotted to the squadrons in France and western Germany’; in essence, the Command ‘became a kennelled watch-dog protection for the V-bomber bases, ensuring security of the bomber take-off platforms.’²³

DISPERSAL AND READINESS

Given the inability of the UK’s air defence system to guarantee the survival of the V-Force, it was accepted from the outset that Bomber Command would need to adopt new patterns of organisation and operation. One survival measure adopted during the 1950s was that of dispersal. To accommodate the V-Force, ten RAF stations – Finningley, Scampton, Waddington, Coningsby, Cottesmore, Wittering, Marham, Honington, Wyton, and Gaydon – were developed as Class 1 airfields, with the necessary infrastructure to support day-to-day peacetime V-bomber operations. However, as had already been noted, it was recognised from the outset that the significance of these stations would not be lost upon Soviet planners and that they would be prime targets for attack in the event of a Soviet pre-emptive strike. To reduce the risk that the latter might lead to the destruction of the V-Force *in toto*, both Headquarters RAF Bomber Command and the Air Staff pressed for the introduction of a system whereby V bombers could be dispersed to alternative airfields across the UK should war appear likely.

Proposals to disperse the V-Force ‘over ten Class 1 and 45 other airfields in the UK’ were approved by the Air Council in June 1955, and in its Quarterly Liaison Report for



Dispersing the V-Force: four Avro Vulcan B2s of No 83 Squadron, based at Scampton, on the ORP at Finningley during a dispersal exercise less than a year before the Cuban Missile Crisis.

the quarter ended 30 September 1955, the Department of the Air Member for Supply and Research noted that ‘urgent attention’ was ‘being directed towards drawing up detailed plans for the dispersal of MBF [Medium Bomber Force] in war, or during times of international tension’ in order ‘to give full effect to HM Government’s declared defence strategy based on the deterrent value of the V-force.’²⁴ Speaking on the Air Estimates for 1955-56 in the House of Commons on 10 March 1955, Ward – then Under-Secretary of State for Air – stressed that all efforts were being made ‘to ensure that a surprise attack by the enemy will not cripple the effectiveness of the V-bomber force and its ability to retaliate at once’:

The Command will have its main bases, on the development of which we have already made considerable progress, and a widely dispersed network of operating sites at home and abroad. It is also being organised to maintain a high state of

readiness and flexibility. These steps are an important contribution to the deterrent, because an aggressor could not safely attempt a surprise assault unless he could be sure of attacking all the American and British strategic airfields simultaneously.²⁵

Reductions in the size of the V-Force led eventually to the number of dispersal airfields being scaled back to 27, 'belonging not only to home-based RAF Commands but in some cases to the Royal Navy and the MoA [Ministry of Aviation]'.²⁶

The provision of dispersal airfields would not in itself serve to safeguard the deterrent force. It was also recognised that Bomber Command would have to shed some of the ponderousness that had hitherto come to characterise bomber operations. The need to increase the Command's readiness state was emphasised by the emergence of a new threat – the entry into service of Soviet ballistic missiles capable of reaching the UK. 'There is at present no form of defence known against ballistic missiles' Ivelaw-Chapman acknowledged in his June 1956 paper to the ACSC:

It is commonly suggested, and may well be true, that when we get into the ballistic missile era none of the currently planned defences will be of any use. And that the only defence then will be to have sufficient ballistic missiles ourselves to ensure that the aggressor is afraid to start. In view of the disparity between the ranges to be covered, we may well expect the Russians to have developed a ballistic missile which is effective against the UK before we have developed a ballistic missile which is effective against Russia. But for the purposes of the deterrent, this is not greatly significant as long as our bombers remain capable of delivering an effective counter attack. What would be significant would be if, while we were still reliant upon bombers, the Russians were able to knock them out by ballistic missiles at their airfields before they could take off.²⁷

'The real defence' of the V-Force, Sandys asserted during a meeting of the Cabinet Defence Committee on 31 December 1957, 'lay in increasing the state of readiness of the bombers, so that they could take off before they could be destroyed on the ground.' At the end of their discussion, the Committee duly 'Invited the Minister of Defence, in consultation with the Secretary of State for Air, to consider arrangements for improving the state of readiness of Bomber Command, including the possibility of accelerating the rate of run-down of Fighter Command for this purpose'.²⁸

To ensure that sufficient numbers of V-Force aircraft were able to evade destruction at their airfields, Bomber Command looked to practices long-established within RAF Fighter Command. On his appointment as AOC-in-C Bomber Command in January 1956, Air Chief Marshal Sir Harry Broadhurst, 'with vast wartime experience of fighter and tactical air operations behind him introduced a "fighter-pilot type" mentality into V-force [sic]

aircrew'.²⁹ At Conference "Prospect" on 6 May 1958, Broadhurst 'said his crews could react from the radar of Fighter Command almost as quickly as they could start up their engines.'³⁰ To facilitate the scrambling of aircraft from readiness 'it was proposed to build operational readiness platforms (ORPs) at the ends of runways on the Class 1 and dispersal airfields...though actual construction was probably not completed until 1963; previously such features were only found on fighter airfields.'³¹ A list of medium bomber dispersal airfields approved for Operational Readiness Platforms, circulated in February 1962 detailed nine Class 1 airfields with ORPs capable of accommodating four aircraft (Finningley, Coningsby, Honington, Scampton, Wittering, Cottesmore, Waddington, Gaydon and Wyton); five dispersal airfields with ORPs that also could accommodate four aircraft (Burtonwood, Bedford, St Mawgan, Ballykelly and Kinloss); and twenty-two dispersal airfields with ORPs that were only capable of taking two V-bombers.³²



ACM Sir Harry Broadhurst, AOC-in-C RAF Bomber Command from January 1956, boarding an Avro Vulcan at Waddington, 22 October 1957.

Bomber Command's alert and readiness system revolved around a series of 'Alert Conditions' and 'Readiness States' ordered by the Bomber Command Operations Centre (BCOC) at HQ Bomber Command. These were laid down in a manual entitled *Bomber Command Alert and Readiness Procedures (Aircraft)*, the second edition of which became effective from 1 August 1962.³³ According to an extract from the latter, 'The degree of preparedness of the Bomber Force is defined as an ALERT CONDITION'. The normal state of the Command in peacetime was designated Alert Condition 4. During 'periods of political tension – which may not be serious enough to warrant Alert Condition 2' the Command could be placed on Alert Condition 3, 'PRECAUTIONARY ALERT'. This condition could be 'issued to all or part of the force at any time' and the 'Specific actions to be taken will be detailed at the time the Alert is announced.'

The next Alert Condition – Alert Condition 2, 'GENERATE AIRCRAFT' – required the Command:

to prepare the maximum number of aircraft to combat serviceability. Aircraft planned to operation [sic] from main bases are to be prepared for operational

take-off and crews are to standby at 15 minutes readiness. All other aircraft are to be armed and prepared for take-off to their dispersal airfields. Reconnaissance Squadrons are to be prepared for operational take-off. All Operations Rooms and other vital services are to be fully manned on a 24 hour basis. Aircraft prepared for dispersal are to remain in this configuration until either ordered to disperse or specifically order [sic] to prepare for operational take-off from main bases.

During this phase, AOC-in-C Bomber Command was 'charged with producing 75% of available aircraft in 24 hours.'³⁴

The highest Alert Condition was Alert Condition 1, 'DISPERSE AIRCRAFT'. At this stage,

Aircraft due to disperse are to proceed to their dispersal airfields and there to be prepared for operational take-off; ['regenerated'] crews will then standby at 15 minutes readiness. Aircraft and crews remaining at main bases continue at 15 minutes readiness. Once this Alert Condition has been announced aircraft will continue to disperse, regardless of Readiness State ordered, unless, or until, it is specifically stopped by BCOG.

The Alert Conditions outlined above regulated the process by which Bomber Command would be readied for combat during a transition-to-war period. They were further qualified by a series of Readiness States, which prescribed the 'take-off readiness of the force' and were 'related to the tactical warning that could be expected of an impending



Alerting the V-Force: a practice scramble by a Vickers Valiant crew at RAF Wyton during a visit to the station by the Duke of Edinburgh, 24 June 1958.

enemy attack.' As such, Readiness States were applied to those elements within Bomber Command that had already been generated to *combat ready* status, and could be varied regardless of the Alert Condition then in force. The first was Readiness State 'One Five', or '15 Minutes'; this required 'All combat ready aircraft...to be prepared to take-off within 15 minutes.' The next rung on the readiness ladder was Readiness State 'Zero 5' ('05 Minutes'), during which combat ready aircraft would be expected to get airborne within five minutes; for those aircraft unable to start their engines simultaneously, and at those airfields lacking Operational Readiness Platforms at the end of the runway, 'cockpit readiness will be accepted as meeting this requirement although a 5 minute reaction may not be possible.' Readiness State 'Zero Two' ('02 Minutes') required 'All combat ready aircraft...to start engines and taxi to the take-off position and there await further instructions by VHF R/T.' Ultimately, combat ready aircraft could be ordered to SCRAMBLE, or 'take-off on their operational mission subject to release while airborne.'

Although this system of Alert Conditions would appear to take the form of a 'ladder', one Alert Condition was not necessarily a precursor to the next. For example, at the beginning of Exercise MICKY FINN II on 20 September 1962, the Command was moved from Alert Condition 4 directly to Alert Condition 2, bypassing Alert Condition 3. Bomber Command could be required to maintain Alert Conditions 2 and 1 for a maximum of thirty days. Readiness State Zero Five was to be held for up to four hours; while Zero Two was envisaged as lasting for no longer than a matter of minutes.

Procedures in Bomber Command's Thor Intermediate-Range Ballistic Missile (IRBM) force differed from those of the MBF. In a letter considering Thor readiness and launch procedures dated 11 August 1959, the Vice-Chief of the Air Staff (VCAS), Air Marshal Sir Edward Hudleston, informed Broadhurst's successor as AOC-in-C Bomber Command, Air Marshal Sir Kenneth Cross, that 'Our aim must be to keep all serviceable missiles at T-15' (15 minutes to launch).³⁵ An Air Staff memo forwarded by VCAS to the CAS on 5 December 1961 stated that 'an average of between 45 and 50 Thor weapons are maintained permanently at fifteen minutes readiness'.³⁶ During MICKY FINN II, 'The Thors once again proved their reliability and 59 out of the 60 weapons available were available for launch at the 1st count down 5½ hours after the alert was called.'³⁷

QUICK REACTION ALERT

It was recognised that while the procedures described above could be used to bring Bomber Command to combat readiness in the period of heightened tension prior to the outbreak of a conflict, they were not suitable to deter an opponent from mounting a 'no-notice' strike. To guard against such an eventuality, a 'Quick Reaction Alert' ('QRA') capability was introduced within Bomber Command. The first element of the Command to adopt QRA was the Valiant 'Tactical Bomber Force' (TBF) assigned to the Supreme Allied Commander Europe (SACEUR). No 207 Squadron was placed at the operational disposal of SACEUR on 1 January 1960, and was incorporated in the latter's QRA system

in October of that year; it was joined in 1961 by Nos 49 and 148 Squadrons. All were co-located at RAF Marham as part of No 3 Group.³⁸

QRA was not restricted to the TBF. Following a trial conducted between 18 September and 14 October 1961 (Exercise MACASSAR) that demonstrated Bomber Command's 'ability to maintain a force of some 15 aircraft at 15 minutes readiness during periods of tension', on 31 October 1961 Air Marshal Cross wrote to the VCAS to press the case for keeping a proportion of his force on permanent alert. 'It seems only military commonsense', Cross argued,

to maintain a permanent alert concept of some form, in the face of the growing Russian threat and the need to build up experience to compete with the greatly reduced warning time during the coming years. A permanent alert force also gives us the opportunity of closer integration with the SAC [Strategic Air Command] reflex forces in this country, thus taking full advantage of our combined strengths and the combined effect of our ECM equipments, especially during the critical phase of penetrating the enemy's outer radar defences.³⁹

The Air Council 'approved in principle the proposal to maintain one aircraft in each medium bomber squadron at fifteen minutes readiness' on 7 December 1961, and this measure was introduced in the following year.⁴⁰ The effect of this was to ensure that even at the normal peacetime Alert Condition – Alert Condition 4 – a proportion of the V-Force was maintained continuously at Readiness State One Five. By the end of that year, 68 weapons systems (54 Thor IRBMs and fourteen aircraft) were 'normally held at immediate readiness (15 minutes)'.⁴¹ In addition to the three QRA Valiants of the TBF, the Medium Bomber Force QRA component in October 1962 comprised six Vulcans of No 1 Group (one at Coningsby, two at Scampton and three at Waddington) and five Victors of No 3 Group (two at Cottesmore, two at Honington and one at Wittering).⁴²

Bomber Command did not attempt to emulate the US Air Force (USAF) practice of maintaining aircraft on airborne alert. In the House of Commons on 19 April 1961, the MP for Rochester and Chatham, Julian Critchley, 'asked the Secretary of State for Air what would be the cost of maintaining a standing air alert consisting of 10 per cent. of the V-bomber force.' Julian Amery replied:

Because of its capacity for quick reaction to warning of attack, the V-bomber force provides an effective deterrent without recourse to air alert. To maintain a standing air alert with 10 per cent. of the Force would involve not only an increase in flying maintenance costs but also substantial changes in the present organisation of Bomber Command. I am not in a position to say precisely what the cost would be.⁴³

However, in his initial arguments in favour of introducing QRA, Cross did suggest that this would 'also lead us gradually into the permanent airborne alert in the Skybolt era', which he envisaged as beginning in '1966/68'.⁴⁴ Such plans centred upon the proposed introduction into Bomber Command service of the Douglas GAM-87 Skybolt air-launched ballistic missile. Although Bomber Command's Operational Research Branch did conduct a number of studies into the practicalities of maintaining an airborne alert, the Kennedy administration's decision to cancel Skybolt at the end of 1962 brought all further work to an end.⁴⁵

THE PROOF OF THE PUDDING? BOMBER COMMAND AND THE CUBAN MISSILE CRISIS

How the Command's war plans might work in the real world would be put to the test in October 1962. The flashpoint for this confrontation would be the Caribbean island of Cuba.

A detailed examination of the Cuban Missile Crisis and its aftermath lies beyond the scope of this paper. However, accounts of the Crisis from a UK perspective indicate that British intelligence officers were first informed by their US counterparts of the location of launch sites on Cuba for Soviet R-12 (NATO designation SS-4 *Sandal*) Medium-Range Ballistic Missiles (MRBMs) and R-14 (SS-5 *Skean*) Intermediate-Range Ballistic Missiles (IRBMs) on 19 October 1962. The British Ambassador to Washington DC, Sir David Ormsby-Gore, cited reports indicating that weapons 'that may not be entirely defensive' had been located on Cuba in a cable to the Foreign Office sent on 20 October. The ambassador was briefed personally by President Kennedy on 21 October and the President sent a personal message to Prime Minister Harold Macmillan later the same day.⁴⁶

The seriousness with which the situation was being taken by the US military was further illustrated by the events of 22 October. During a meeting of the US Joint Chiefs of Staff on the morning of that day, the US Air Force's Chief of Staff, General Curtis E LeMay, requested approval for the introduction, from midday, of a series of measures intended to raise the USAF's readiness in general – and that of SAC in particular. These included: authorising SAC to institute an airborne alert (increasing to one-eighth of the Command's aircraft by the afternoon of the following day), and to begin the dispersal of the Command's Boeing B-47s to civilian airports at the discretion of the Commander-in-Chief SAC; similarly authorising the dispersal of Continental Air Defense Command (CONAD)'s interceptor aircraft 'on a very quiet, low-key basis'; raising the world-wide Defence Condition (DEFCON) to DEFCON 3; and further raising that of SAC to DEFCON 2, the latter to be completed within twenty-four hours. Although the Joint Chiefs authorised the introduction of the airborne alert and the dispersal of SAC and CONAD aircraft, they elected to seek the approval of Secretary of Defense McNamara before instituting the increase in DEFCON states proposed by LeMay.⁴⁷

USAF commands were subsequently placed on DEFCON 3 with effect from 2300Z on 22 October, and the US government would appear to have exerted pressure upon its NATO allies to follow their lead. A key player in the relationship between the Kennedy administration and the NATO governments would appear to have been General Lauris Norstad, USAF, who held the dual appointments of US Commander-in-Chief, Europe (USCINCEUR) and SACEUR. Norstad's relationship with Kennedy and Secretary of Defense Robert McNamara had hitherto been difficult; by mid-1962 their 'disputes... had deepened well beyond any chance of accommodation', and although the general's retirement had been announced in July 1962 on health grounds, 'Norstad, who felt fine, told colleagues he had been fired.'⁴⁸ Although due to be replaced imminently by General Lyman L. Lemnitzer, US Army, Norstad nevertheless found himself serving as a linchpin in the relationship between Washington and the European NATO capitals. In a letter sent to Norstad on 22 October, Kennedy stated that as the crisis had begun to unfold he had 'given much thought to its impact upon NATO and your tasks as SACEUR':

I have regretted the inability to widen the circle of discussion during this period and particularly to enlist the support of NATO governments for the course of action which the United States has been obliged to take. While I know that our action creates a difficult situation for you, both in your role of SACEUR and CINCEUR, I have every confidence in your leadership and experience to help us over this critical period in our NATO relationships. Undoubtedly, a Soviet objective in undertaking to create a military base on Cuba has been his long time desire to split the NATO alliance. This we must not allow him to do and I know that your persuasive voice will carry great weight with our allies in presenting the logic and necessity of the American action.⁴⁹

As Kennedy predicted, the task facing Norstad was a difficult one. The readiness state of NATO forces in Europe would prove a particularly divisive issue. Although Prime Minister Harold Macmillan noted in his diary entry for 22 October that 'Washington, in a rather panicky way, have been urging a NATO 'alert', with all this implies (in our case, Royal Proclamation and call-up of Reservists)', it was far from axiomatic that Britain would bow to this request.⁵⁰

The prevailing UK position with regard to NATO's alert system had been agreed seven years earlier. On 15 September 1955, the Cabinet – of which Macmillan, as Foreign Secretary, was then a member – considered a memorandum by Minister of Defence (Selwyn Lloyd) detailing a request from Norstad's predecessor as SACEUR, General Alfred M Gruenther, US Army. Gruenther was keen to ensure that 'national authorities' should 'agree that when a warning period was called he should be automatically authorised to put into force measures which he himself could carry out, and that national authorities should at the same time automatically put into force the measures which they alone

could take.'⁵¹ During the ensuing discussion, it became clear that the Cabinet were unwilling to delegate to Gruenther the authority that he sought. 'For political and other reasons', the minutes record, 'it might not be possible for the Government to give full effect immediately to all of the preparations in question, and on certain of them...the Government would have to reserve their position' – although the Cabinet did undertake to 'do all we could to meet SACEUR's wishes, and...even those measures on which the Government had to reserve their position would be given the most sympathetic consideration when the time arose.'⁵²

Now that the time had indeed arisen, Macmillan urged caution. The Prime Minister's personal experiences as a Guards officer during the First World War had left him with 'a scepticism about human and political pretensions, about the claims of military planners, and about the uses of armed conflict', and he now balked at the possibility of stumbling into a new and even more devastating conflict.⁵³ On the evening of 22 October the Prime Minister 'gave a large dinner for General Norstad, which lasted from 8-11', during the course of which he informed SACEUR 'that we w[oul]d not repeat not agree at this stage' to Washington's call for an increase in the NATO alert state. 'N[orstad] agreed with this', Macmillan continued in his diary, 'and said he thought NATO powers w[oul]d take the same view. I said that 'mobilisation' had sometimes caused war. Here it was absurd, since the additional forces made available by 'Alert' had no military significance.'⁵⁴ The SACEUR would appear to have succeeded in transmitting the concerns of Macmillan and other NATO leaders across the Atlantic; for in his diary entry for the following day, Macmillan noted that during a conversation in the afternoon Norstad passed on 'the good news that he had persuaded Washington to be more reasonable....'⁵⁵

The British Government continued to monitor events as they unfolded during the following week, liaising with Washington, but taking no overt action to increase the alert and readiness state of the V-Force. However, as the crisis deepened, at 1100 on Saturday 27 October 1962 the CAS, Air Chief Marshal Sir Thomas Pike, attended a meeting with the Prime Minister at Admiralty House.⁵⁶ Sir Thomas outlined the substance of his meeting with the Prime Minister to his fellow Chiefs of Staff – the First Sea Lord (Admiral of the Fleet Sir Caspar John) and the Chief of the Imperial General Staff (General Sir Richard Hull) – at the Ministry of Defence at 1430 that afternoon and a record of this 'conversation' prepared by the Secretary of the Chiefs of Staff Committee is now preserved in The National Archives.⁵⁷

According to this record, Sir Thomas began by relaying a summary of a communication between President Kennedy and the Prime Minister on the evening of 26 October in which the President had described the assurances that the US Government required with regard to the withdrawal of offensive weapons from Cuba. President Kennedy had gone on to state that 'unless he received these assurances within 48 hours he would

take action to destroy the rocket sites by bombing, by invasion, or both.’ CAS further reported that although President Kennedy had ‘stated that he would consult with the Tripartite nations before taking any definite action.... [T]he Prime Minister considered this might take the form of information rather than consultation.’

The Prime Minister had then gone on to discuss with Sir Thomas ‘the current alert posture of our forces.’ Although senior officers of the Air Ministry, Admiralty and War Office had been warned ‘to be available, if required at approximately one hour’s notice’, the Prime Minister was ‘adamant that he did not consider the time was appropriate for any overt preparatory steps to be taken such as mobilisation. Moreover, he did not wish Bomber Command to be alerted, although he wished the force to be ready to take the appropriate steps should this become necessary.’ While plans were in hand to call a meeting of the Cabinet on 28 October should the situation continue to deteriorate, the Prime Minister’s intention was ‘that matters should be played as low key as possible.’

Sir Thomas informed his fellow Chiefs of Staff that ‘as a result of his conversation with the Prime Minister, he had warned the Air Officer Commanding-in-Chief, Bomber Command that he should be on the alert and that his key personnel should be available on station. There were ten bombers overseas at present, but he felt that it was not desirable to recall these aircraft at the moment.’ During their ensuing discussion, the Chiefs of Staff agreed that while measures could be taken ‘in a Precautionary Stage, and before any NATO Alert was declared, these had little military significance without the calling of general mobilisation’, it was nevertheless essential

for Bomber Command to be alerted and dispersed as soon as the situation so warranted in order that its deterrent effect should be seen to remain credible. This measure would be the most effective that could be carried out short of general mobilisation, and would give political reassurance to the United States.

Should the US mount any offensive action against Cuba, the Chiefs of Staff believed that ‘One of the most likely reactions...would be to occupy West Berlin’. However, they concluded that as ‘Berlin was indefensive [sic] militarily’, existing plans to mount probes along the ground access routes to the city would be ‘useless’ and that ‘The Prime Minister should be advised of this in order that he may urge the President to restrain General Norstad from undertaking any such operation.’⁵⁸

Considerable confusion has grown up with regard to the stance adopted by RAF Bomber Command during the course of the crisis. In *Countdown: Britain’s Strategic Nuclear Forces*, Air Vice-Marshal Stewart Menaul – the Senior Air Staff Officer at HQ Bomber Command between 1961 and 1965 – described the impact of the Cuban Missile Crisis on the Command from 27 October 1962. In his account, AVM Menaul notes that at the

time of the crisis Bomber Command was engaged in 'one of their frequent alert and readiness exercises'. On the evening of 26 October, the AOC-in-C Bomber Command, Air Marshal Sir Kenneth Cross, 'called the duty operations officer on the telephone to say that he had decided to allow the exercise to proceed and to retain the existing readiness state for the time being'; subsequently, following a discussion with his senior staff officers Sir Kenneth 'decided to increase the readiness state of the force, purely as part of the training exercise.' As a result, 'Both the Thor missile force and the V-bombers were at fifteen minutes readiness.'⁵⁹



The AOC of No 3 Group, RAF Bomber Command, AVM Kenneth ('Bing') Cross, in front of a Vickers Valiant in December 1958. Cross superseded Broadhurst as the Command's AOC-in-C in May 1959.

Given the author's senior position with HQ Bomber Command at the time of the Cuban Missile Crisis, AVM Menaul's account has been accepted by a number of scholars as an accurate insight into the posture of Bomber Command during the Crisis and the decisions made by its AOC-in-C, acting apparently upon his own initiative. However, in a supplementary paper published in the proceedings of a joint meeting of the RAF Historical Society and the [US] Air Force Historical Foundation in 1993, the then Head of the Air Historical Branch, Group Captain Ian Madelin RAF (Retd), noted that the recollections of Sir Kenneth Cross 'differ from those of Air Marshal [sic] Stewart Menaul'.⁶⁰ AVM Menaul's recollections are also at variance with Bomber Command records now deposited in The National Archives. On consulting the RAF Form 540 for RAF Bomber Command in October 1962, it is clear that the Command was *not* in the midst of an alert and readiness exercise on 26-27 October 1962. Rather, Exercise MICKY FINN 2 had taken place during the previous month; this exercise being timed to coincide with NATO Exercise FALLEX 62.⁶¹ Moreover, there is no evidence of an increase in the Command's Alert Condition or Readiness State prior to the meeting between CAS and the Prime Minister on the morning of 27 October 1962.⁶²

The Operations Record Books (ORBs) for both HQ No 1 Group and HQ No 3 Group record that the Command was ordered to move to Alert Condition 3, Precautionary Alert, on or immediately after 1300Z on 27 October 1962.⁶³ The measures to be taken were described by the compiler of the ORB for HQ No 1 Group in the following terms:

All key personnel were required to remain on station and Operation Room staff to be available at short notice. Although no generation of aircraft was ordered, some preparations were made to ensure rapid generation if necessary. All measures were to be unobtrusive.⁶⁴

On the following day, a limited increase in the number of aircraft on QRA would appear to have been ordered by HQ Bomber Command. According to the ORB for HQ No 1 Group, at 1547Z on 28 October the Group was instructed to increase the number of aircraft on QRA from six to twelve, 'to be effective as soon as possible after 0800Z on 29th October, 1962'.⁶⁵ Although there is no record of such an order in the ORB for HQ No 3 Group, there are indications that this Group also increased the number of aircraft on QRA during the course of the Crisis.⁶⁶ Additionally, on 28 October 1962 an Exercise SUNSPOT detachment of eight Vulcan B1As belonging to No 50 Squadron to RAF Luqa, Malta, was recalled.⁶⁷

All available Thor IRBMs were also brought to 15 minutes readiness on 27 October. In a letter to VCAS dated 31 October 1962, the AOC-in-C Bomber Command noted that 'The recent Cuban crisis emphasizes the value of Thor as a deterrent weapon'. Sir Kenneth went on to note that 'Because its normal state of readiness is 15 minutes the whole system...could be alerted inconspicuously.'⁶⁸ However, there is no reference in any of the official sources thus far consulted that the Thor component (either wholly or in part) was raised to a higher readiness state during the course of the crisis.

The only tangible change in Bomber Command's readiness during the course of the crisis, therefore, appears to have been an increase in the number of aircraft on QRA. There is no indication that the readiness state of QRA aircraft in the Command was raised above Readiness State One Five in response to a perceived threat of nuclear attack at any stage during the Cuban Missile Crisis. However, it is of course conceivable that an increase in the readiness state for the QRA aircraft may have been ordered by the BCOC at points during the crisis in order to ensure that QRA crews remained vigilant. RAF Bomber Command remained at Alert Condition 3 until 5 November 1962, when the latter was cancelled and QRA states returned to normal.⁶⁹

CONCLUSION

During the late 1950s, the Royal Air Force put in place a number of measures intended to secure the effectiveness of the MBF in the deterrent role. These concentrated, in large part, in ensuring that elements of the V-Force could survive a pre-emptive Soviet nuclear attack and thus be able to threaten a credible counter-strike. However, although a small proportion of the aircraft and crews available were maintained on QRA, mobilisation of the V-Force in its entirety during an international crisis depended upon the willingness of the UK's political leaders to raise Bomber Command's Alert Condition – at the risk of further raising international tension.

This dilemma was illustrated graphically during the Cuban Missile Crisis. Sir Kenneth Cross would later comment on the marked lack of direction shown by the UK's higher politico-military leadership during the course of the crisis: 'from him downwards, everything worked perfectly; from him upwards, he perceived nothing worked at all.'⁷⁰ It is clear, however, that this apparent lack of direction was driven in large part by Harold Macmillan's determination to do everything in his power to minimise the danger of a nuclear exchange; 'business as usual' was very much the order of the day. Macmillan's rejection of any overt measures that might worsen the situation was evident both in his dealings with General Norstad, and in the briefing given by Sir Thomas Pike to his fellow Chiefs of Staff on the afternoon of 27 October 1962. Moreover, the surviving primary papers indicate clearly that the measures taken by HQ Bomber Command were consistent with the wishes of the Prime Minister. This was reflected by Sir Kenneth in his letter to the VCAS on 31 October 1962 cited above, in which the former went on to point out that 'despite having everything ready to bring 75% of the aircraft in the Command to readiness, we could not give the order for fear of the effect it might have (if it became known) on the very tense negotiations being carried on by Mr Krushchev and Mr Kennedy.'⁷¹ Macmillan would appear to have feared that by placing Bomber Command on a war footing, the British Government could tip the international situation further out of control and thereby bring about the nuclear exchange that the Command was intended to deter.

BIBLIOGRAPHY

- Armitage, Michael. *The Royal Air Force: An Illustrated History*. London: Arms and Armour Press, 1993.
- Bew, John. *Citizen Clem: A Biography of Attlee*. London: riverrun [sic], 2016.
- 'Bomber Command.' *Flight* LVII, no. 2167 (1950): 25-27.
- Bowyer, Chaz. *Fighter Command 1936-1968*. London: Sphere, 1981.
- Boyle, Marshal of the Royal Air Force Sir Dermot. *My Life: An Autobiography* second ed. Fairford: Royal Air Force Benevolent Fund, 1990.
- Brodie, Bernard. *Strategy in the Missile Age*. Santa Monica, CA.: RAND, 1959.
- Brookes, Andrew. 'Death Knell For UK Aerospace? 1957 Defence White Paper Revisited.' *Air International* 73, no. 6 (2007): 56-8.
- Catterall, Peter, ed. *The Macmillan Diaries: Prime Minister and After, 1957-1966* Vol. II: Macmillan, 2011.
- Cocroft, Wayne D., and Roger J.C. Thomas. *Cold War: Building for Nuclear Confrontation 1946-1989*. Swindon: Historic England, 2016.
- Hennessey, Peter. *The Prime Minister: The Office and its Holders since 1945* London: Allen Lane, 2000.
- Macmillan, Harold. *Riding the Storm: 1956-1959*. London: Macmillan, 1971.
- Madelin, Group Captain Ian. 'Further Comments on Command and Control of British Nuclear Forces During the Cuban Missile Crisis.' *In Seeing Off the Bear: Anglo-American Air Power Cooperation During the Cold War*, edited by Roger G. Miller. Washington, DC:

Air Force History and Museums Program, United States Air Force, 1995.

Menaul, Air Vice-Marshal Stewart. *Countdown: Britain's Strategic Nuclear Forces*. London: Robert Hale, 1980.

Neustadt, Richard E., and Ernest R. May. *Thinking In Time: The Uses of History for Decision Makers*. New York, NY: The Free Press 1986.

Poole, Walter S. *History of the Joint Chiefs of Staff: The Joint Chiefs of Staff and National Policy, Volume VIII, 1961-1964*. Washington, DC: Office of Joint History, Office of the Chairman of the Joint Chiefs of Staff, 2011.

'Service Aviation: Conference "Prospect".' *Flight* 73, no. 2573 (1958): 688.

Thomas-Symonds, Nicklaus. *Attlee: A Life in Politics*. London: I B Tauris, 2010.

Twigge, Stephen, and Len Scott. *Planning Armageddon: Britain, the United States and the Command of Western Nuclear Forces, 1945-1964*. Abingdon: Routledge, 2014.

Wynn, Humphrey. *The RAF Nuclear Deterrent Forces: their origins, roles, and deployment 1946-1969, A documentary history*. London: HMSO, 1994.

NOTES

¹ The National Archives (TNA) CAB 21/4053, annex of loose minute to William Armstrong, Private Secretary to Secretary of the War Cabinet, 6 September 1945.

² Nicklaus Thomas-Symonds, *Attlee: A Life in Politics* (London: I B Tauris, 2010), 195.

³ John Bew, *Citizen Clem: A Biography of Attlee* (London: riverrun [sic], 2016), 369.

⁴ 'Bomber Command,' *Flight* LVII, no. 2167 (1950): 25.

⁵ 'Bomber Command,' 26.

⁶ TNA AIR 2/15917, enclosure 60B, 'Command Directive to Air Marshal Sir Hugh P Lloyd, KBE, CB, MC, DFC', 16 March 1950, para 3. In addition to its primary role, 'Alternative, or additional, commitments which, in emergency' Bomber Command could also be called upon to fulfil included 'Attacks against enemy submarine bases or other maritime objectives in connection with the war at sea'; 'Such sea mining operations as you may be called upon to undertake'; and 'Attacks against objectives in support of the Northern European regional forces.'

⁷ TNA AIR 2/15917, enclosure 60B, para 4.

⁸ Cmd 9397 'Air Ministry: Memorandum by the Secretary of State for Air to Accompany Air Estimates, 1955-56', (London: HMSO, February 1956), para. 7, 3; para. 9, 4.

⁹ Bernard Brodie, *Strategy in the Missile Age* (Santa Monica, CA.: RAND, 1959), 281.

¹⁰ *Ibid.*, 283 (italics as in original).

¹¹ TNA CAB 21/4035, JPG/55/1 'JIC (55)12', 4 January 1955.

¹² Harold Macmillan, *Riding the Storm: 1956-1959* (London: Macmillan, 1971), 11 (italics and parentheses as in original).

¹³ Peter Catterall, ed. *The Macmillan Diaries: Prime Minister and After, 1957-1966*, vol. II (Macmillan, 2011), 73-4 (text in parantheses added).

¹⁴ TNA AIR 6/124, SC(56)16 'Air Council Standing Committee: Future Size and Shape of the Royal Air Force: Note by VCAS', 7 June 1956, para 15, 7-8.

¹⁵ Cmnd 124 'Defence: Outline of Future Policy' (London: HMSO, April 1957), para 3, 1.

¹⁶ Cmnd 124, para 12, 2-3.

¹⁷ Cmnd 124, para 17, 3.

¹⁸ Marshal of the Royal Air Force Sir Dermot Boyle, *My Life: An Autobiography* second ed. (Fairford: Royal Air Force Benevolent Fund, 1990), 108.

¹⁹ Andrew Brookes, 'Death Knell For UK Aerospace? 1957 Defence White Paper Revisited,' *Air International* 73, no. 6 (2007): 57.

²⁰ Stephen Twigge, and Len Scott, *Planning Armageddon: Britain, the United States and the Command of Western Nuclear Forces, 1945-1964* (Abingdon: Routledge, 2014), 288.

²¹ Cmnd 373 'Air Ministry: Memorandum by the Secretary of State for Air to Accompany Air Estimates, 1958-59', (London: HMSO, February 1958), para.32, 6.

²² Michael Armitage, *The Royal Air Force: An Illustrated History* (London: Arms and Armour Press, 1993), 204.

²³ Chaz Bowyer, *Fighter Command 1936-1968* (London: Sphere, 1981), 221; 22.

²⁴ Humphrey Wynn, *The RAF Nuclear Deterrent Forces: their origins, roles, and deployment 1946-1969, A documentary history* (London: HMSO, 1994), 79; 122.

²⁵ Hansard HC Deb 10 March 1955 vol 538 col 630.

²⁶ Wynn, *The RAF Nuclear Deterrent Forces: their origins, roles, and deployment 1946-1969, A documentary history*, 122 n.2.

²⁷ TNA AIR 6/124, ACSC (56)16, para 8, 4-5.

²⁸ TNA CAB 131/18, D(57)14, 31 December 1957, Item 4.

²⁹ Wynn, *The RAF Nuclear Deterrent Forces: their origins, roles, and deployment 1946-1969, A documentary history*, vii.

³⁰ 'Service Aviation: Conference "Prospect",' *Flight* 73, no. 2573 (1958): 688. In his autobiography, Sir Dermot Boyle recalled that in response to the 1957 White Paper 'I arranged to mount an exercise in London called Prospect, in which the Air Staff presented the case for manned aircraft to an assembly of some three hundred people, representing every aspect of public life. His Royal Highness the Duke of Edinburgh was not present even though some newspapers said he was. The conference was, however, attended by MPs, Service Chiefs, leaders of industry, trade unionists and many others. We invited Duncan Sandys but he did not attend. Our arguments were quite unanswerable, and indeed few tried to counter them, instead I think virtually everyone present agreed with them. The debate later centred, instead, on what right the Air Marshals had to challenge, publicly, the opinion of the Minister of Defence.' Boyle, *My Life: An Autobiography* 109.

³¹ Wayne D. Cocroft, and Roger J.C. Thomas, *Cold War: Building for Nuclear Confrontation 1946-1989* (Swindon: Historic England, 2016), 27.

³² Wynn, *The RAF Nuclear Deterrent Forces: their origins, roles, and deployment 1946-1969, A documentary history*, 306-7.

³³ TNA AIR 2/16435, enclosure 28.

³⁴ TNA AIR 8/2369, letter from AM Sir Kenneth Cross to MRAF Sir Thomas Pike, 21 September 1962.

³⁵ TNA AIR 8/2238.

³⁶ TNA AIR 8/2369.

³⁷ TNA AIR 8/2369, letter from AM Sir Kenneth Cross to MRAF Sir Thomas Pike, 21 September 1962. Although the RAF's initial Thor strength stood at sixty missiles, during 1961 one Thor was withdrawn from the front-line in order to be used for training purposes by the Bomber Command Strategic Missile School at Feltwell. Wynn, *The RAF Nuclear Deterrent Forces: their origins, roles, and deployment 1946-1969, A documentary history*, 347; 49 n.1.

³⁸ *Ibid.*, 363; 68; 71.

³⁹ TNA AIR 8/2369, letter from AM Sir Kenneth Cross to ACM Sir Edmund Hudleston, 31 October 1961.

⁴⁰ TNA AIR 8/2369, Air Council Conclusions of Meeting 23(61), 7 December 1961, item IV.

⁴¹ TNA AIR 8/2369, letter from AM Sir Kenneth Cross to MRAF Sir Thomas Pike, 30 November 1962.

⁴² TNA AIR 1/16435, draft prepared by Ops B2, Air Ministry entitled 'Notes on Bomber Command plan to meet increased QRA commitment', 17 January 1963. According to Wynn, 'At the beginning of 1962 the readiness for Saceur [sic]-assigned squadrons was increased when, on 1 January, a revised Nuclear Strike Plan came into effect; it meant that four Valiants instead of three were held at 15 minutes readiness at Marham'; Wynn, *The RAF Nuclear Deterrent Forces: their origins, roles, and deployment 1946-1969, A documentary history*, 335. However, this increase would appear to have been delayed pending the funding of the additional facilities and personnel necessary to accommodate a fourth QRA aircraft at Marham. A number of entries for the regular practice QRA alerts initiated by Bomber Command Operations Centre (Exercise EDOM) in HQ No 3 Group's F540 submission for December 1962 (TNA AIR 25/1548) refer to 'The *three* SACEUR QRA aircraft and the five QRA aircraft from the MBF stations' (my italics). It would therefore appear the Valiant QRA commitment remained at three aircraft until at least the end of 1962 – thus accounting for the total of fourteen aircraft (eleven MBF and three TBF) cited by the AOC-in-C Bomber Command in his letter to CAS of 30 November 1962 (see n41).

⁴³ Hansard HC Deb 19 April 1961 vol 638 c108W.

⁴⁴ TNA AIR 8/2369, letter from AM Sir Kenneth Cross to ACM Sir Edmund Hudleston, 31 October 1961.

⁴⁵ See, for example, TNA AIR 14/4211, Memorandum 28, 'Aircraft Utilisation during a Continuous Airborne Alert using Free Fall and Stand Off Weapons', Operational Research Branch, Headquarters Bomber Command, March 1962; TNA AIR 14/4324, Memorandum 255, 'Trial 448: An Airborne Alert. Analysis of the Aircraft Servicing Aspects', Operational Research Branch, Headquarters Bomber Command, September 1962.

⁴⁶ Peter Hennessey, *The Prime Minister: The Office and its Holders since 1945* (London: Allen Lane, 2000), 118.

⁴⁷ Walter S. Poole, *History of the Joint Chiefs of Staff: The Joint Chiefs of Staff and National Policy, Volume VIII, 1961-1964* (Washington, DC: Office of Joint History, Office of the Chairman of the Joint Chiefs of Staff, 2011), 173.

⁴⁸ Ibid., 202.

⁴⁹ *Foreign Relations of the United States, 1961–1963, American Republics; Cuba 1961–1962; Cuban Missile Crisis and Aftermath, Volumes X/XI/XII, Microfiche Supplement*, Document 362: 'Telegram 221822Z to Supreme Allied Commander, Europe, October 22'; <https://s3.amazonaws.com/static.history.state.gov/frus/frus1961-63v10-12mSupp/pdf/d362.pdf>, accessed 12 May 2017.

⁵⁰ Catterall, *The Macmillan Diaries: Prime Minister and After, 1957–1966*, 510.

⁵¹ TNA CAB 129/77, CP(55)120, 13 September 1955, para 3, 1.

⁵² TNA CAB 128/29, CM(55) 21, 15 September 1955, minute 4, 4–5.

⁵³ Richard E. Neustadt, and Ernest R. May, *Thinking In Time: The Uses of History for Decision Makers* (New York, NY: The Free Press 1986), 193.

⁵⁴ Catterall, *The Macmillan Diaries: Prime Minister and After, 1957–1966*, 510.

⁵⁵ Ibid., 511.

⁵⁶ No 10 Downing Street was then in the process of being refurbished.

⁵⁷ TNA DEFE 32/7, COS 1546/29/10/62 'Record of a conversation between the Chief of the Air Staff, the First Sea Lord and Chief of the Imperial General Staff in the Ministry of Defence at 1430 on Saturday, 27th October, 1962'. The account of this conversation that follows is based exclusively from the record contained on this file. The use of the word 'conversation' in this context may reflect the fact that the Chief of the Defence Staff, Admiral of the Fleet Lord Mountbatten of Burma, was away from London on the afternoon of 27 October 1962 and could not therefore be present. In the absence of their chairman the Chiefs of Staff would not appear to have been able to 'meet' formally as a committee.

⁵⁸ The notes of this meeting state that 'It was not intended that Commander-in-Chief, British Army of the Rhine, who was on holiday in Scotland, should be recalled at the moment.'

⁵⁹ Air Vice-Marshal Stewart Menaul, *Countdown: Britain's Strategic Nuclear Forces* (London: Robert Hale, 1980), 115.

⁶⁰ Group Captain Ian Madelin, 'Further Comments on Command and Control of British Nuclear Forces During the Cuban Missile Crisis,' in *Seeing Off the Bear: Anglo-American Air Power Cooperation During the Cold War*, ed. Roger G. Miller (Washington, DC: Air Force History and Museums Program, United States Air Force, 1995), 224.

⁶¹ TNA AIR 24/2688, *Headquarters Bomber Command Post Exercise Report; Exercise MICKY FINN II*, confirms that MICKY FINN II took place on 20–21 September 1962. Additionally, a *Report on Exercise FALLEX '62* is also appended to HQ Bomber Command's Operations Record Book submission for October 1962. According to the latter, the synthetic phase of this exercise took place between 6–20 September 1962; this was followed by a 'live' phase that 'coincided with Bomber Command Exercise MICKY FINN. All stations in the Command were involved from the 20th–21st September, 1962.' The third phase of the exercise (a mixture of live and synthetic play) took place during 21–22 September 1962. A separate alert and readiness exercise for the Thor force – REDOUBLE – was conducted alongside MICKY FINN II.

⁶² A further indication of the fact that no increase in the Alert Condition had been instituted by Sir Kenneth Cross prior to 27 October 1962 is provided by the 'Supplement to Form 540 – AOC-in-C's engagements for the month of October, 1962' appended to the ORB submitted HQ Bomber Command (TNA AIR 24/2688), which records that on the evening of 26 October 'The Commander-in-Chief attended the Autumn Ball at Headquarters Bomber Command'.

⁶³ According to the ORB submitted by HQ No 1 Group for October 1962 (TNA AIR 25/1703), this change in the Alert Condition was initiated 'at 1300Z on 27th October, 1962'. By contrast, the ORB for HQ No 3 Group (TNA AIR 25/1548) states that 'The Air Officer Commanding-in-Chief declared Alert Condition 3 for Bomber Command at 1307 hours.'

⁶⁴ TNA AIR 25/1703.

⁶⁵ TNA AIR 25/1703.

⁶⁶ For example, the ORB for RAF Wittering (TNA AIR 28/1667), then in No 3 Group, states that 'After the Station had been brought to Alert Condition 3 on 27th October 1962 in view of the world situation, an additional aircraft and crew were placed on QRA readiness.'

⁶⁷ TNA AIR 25/1703, ORB, No 1 Group, October 1962. Seven of the aircraft arrived back at RAF Waddington on the following day; however, the eighth aircraft was declared Cat 3 and as a result its return was delayed until 1 November 1962.

⁶⁸ TNA AIR 20/11371, letter from Air Marshal Sir Kenneth Cross to Air Marshal Sir Wallace Kyle, 31 October 1962.

⁶⁹ TNA AIR 25/1703.

⁷⁰ Madelin, 'Further Comments on Command and Control of British Nuclear Forces During the Cuban Missile Crisis,' 225.

⁷¹ TNA AIR 20/11371, letter from Cross to Kyle, 31 October 1962.

THE COLD WAR CINDERELLA SERVICE: RAF MARITIME PATROL AIRCRAFT OPERATIONS SINCE 1945

By Group Captain Rob O'Dell

Biography: Group Captain Rob O'Dell is an Air Battle Manager whose career has centred on airborne ISR including 4,000 flying hours on the Sentry gained over the Balkans, Afghanistan and Iraq. He completed a Chief of the Air Staff's Tedder Fellowship at Cambridge studying International Relations in 2012 and is currently stationed at RAF Waddington in ISTAR Force Headquarters.

Abstract: 'The Cinderella Service', a phrase coined to describe Coastal Command during World War Two, is perhaps equally apposite when applied to RAF Maritime Operations in the post war period owing to the lack of public recognition of these often clandestine operations. Despite often being the only RAF force 'in daily contact with the enemy', there is little acknowledgement, even today, of the unforgiving and dangerous operations conducted off the coast of the British mainland in defence of UK interests. This article provides an overview of the activities of the 'Kipper Fleet', from the nadir immediately following World War Two until the capability was withdrawn from service in 2010.

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INTRODUCTION

'We were the only...[RAF]...force in daily contact with the enemy...outside our magic circle, few people really knew the technological battle being fought daily many miles off the UK west coast...'

RAF Nimrod Navigator.¹

Coastal Command was known as the 'Cinderella Service' in World War 2 for the way its endeavour and achievements were largely eclipsed by Bomber and Fighter Commands. Sadly, this lack of recognition for RAF maritime operations has arguably persisted up to the modern day. Yet the operational challenges faced by Maritime Reconnaissance (MR) crews have been every bit as constant, varied and challenging as their counterparts from other operational communities.

Emerging from World War 2 as a highly capable and experienced organisation, Coastal Command's maritime capacity was largely centred on US 'lend-lease' types. However, post-War austerity dictated an extremely rapid contraction on the cessation of hostilities and Coastal Command immediately found itself much as it was at the outbreak of war, lacking a suitable land-based Maritime Patrol Aircraft (MPA) to augment its flying boats. After its interim use of Lancasters, the Shackleton entered service alongside the US Neptune in the early 1950s. These types handled the bulk of activity during the early Cold War years in roles which were as varied as they were geographically dispersed. The Berlin airlift, Korea, policing of colonial outposts and use in a secondary trooping role were all to the fore. Yet poor equipment, developmental problems with the Shackleton and attempts by the RN to seize Coastal Command assets from the RAF hampered maritime capabilities. Moreover, these challenges were faced as the Soviet Navy transitioned from being an essentially coastal force to one capable of delivering true 'blue-water' effect.

By the 1960s, the last of the RAF's Sunderland flying boats had finally been retired and the Shackleton formed the cornerstone of Coastal Command's capabilities. Meanwhile, the threat from Soviet surface and sub-surface combatants had developed to the point where it was capable of threatening strategic UK and NATO interests. This dictated expanded cooperation with the US and other NATO members as a new, highly secret and unforgiving technological battle evolved to track Soviet submarines. For Coastal Command, much of this occurred on long sorties over Arctic, Atlantic and Mediterranean waters. Simultaneously, however, RAF MPAs were proving equally essential to the UK's divestment of its Empire. Yet once again, politics complicated the search for a new MPA before the Nimrod MR1 entered service just as its parent organisation was absorbed into the new RAF Strike Command.

After distinguished service throughout the 1970s, the Nimrod proved essential during the Falklands War of 1982, and following the end of the Cold War, the RAF found itself

returning to MPA operations beyond the traditional realm of NATO. In this new unstable world, RAF MPAs found themselves being employed in increasingly varied Command and Control, Intelligence, Surveillance and Reconnaissance (C2ISR) roles to support UK ground forces. However, the reduced Russian naval threat increasingly brought into question the need for an ageing UK MPA fleet. Significant development problems with the Nimrod MRA4 and government focus on land-centric operations in Iraq and Afghanistan saw the Nimrod MR2s retired and the MRA4 Programme cancelled in 2010, leaving the RAF without a dedicated MPA for the first time in its history. Thankfully, the Service now finds itself on the verge of reintroducing the capability from 2019 in the form of the P-8 Poseidon. Against a resurgent Russian naval threat, we can expect to see the ‘Kipper Fleet’ rapidly re-establish itself as a central pillar of UK Defence.

This essay seeks to provide an overview of post-war RAF MPA operations, in this case defined as fixed wing Anti-Submarine Warfare (ASW), Anti-Surface Warfare (ASuW) (including general surface surveillance and Maritime Radar Reconnaissance (MRR)) and Search and Rescue (SAR) activity. Against a variety of political, technological and operational factors, the disproportionate significance of post-war RAF maritime operations to the RAF remains poorly acknowledged. The modern aircrew branch structure and the Service’s position within Joint operations were all heavily influenced by Coastal Command requirements and broader RAF maritime operations. As the initial UK P-8 enters final production in 2018, the regeneration of the RAF’s Maritime Patrol fleet will see the Service re-enter the secretive battlespace. Although small in number in comparison to their Typhoon and F-35 counterparts, the RAF P-8 force will be no less important to our Nation’s interests.

1945-1960: A NEW WORLD ORDER

‘We were all conscious of the flash, firstly from seeing the glare through our hands, then quickly from the heat on our backs. I felt it through my flying suit. It grew hotter and hotter; and kept increasing until I began to wonder if someone had miscalculated and we were about to be fried.’

Shackleton co-pilot observing the first British H-Bomb test.²

Coastal Command ended the War in Europe with 511 MR aircraft primarily consisting of Short Sunderland flying boats and Lend-Lease Fortresses, Liberators and Catalinas.³ An immediate run-down of the Command saw the disbandment of Catalina units and the transfer of many Liberators to Transport Command.⁴ This process was accelerated with the surrender of Japan in August 1945, not least as many of the squadrons in this latter theatre were from the Commonwealth and rapidly recalled home.⁵ Moreover, the UK’s enormous fiscal challenges and the parlous state of US Lend-Lease types that had proved so critical to wartime ASW dictated that these

hard-worked aircraft simply could not be economically retained by Coastal Command. By 1946, Coastal Command therefore found itself with an unbalanced force favouring Photographic and Meteorological Reconnaissance, duties for which at that time it was still responsible, but which was already acknowledged to be insufficient for peacetime ASW and ASuW.

The situation was aggravated by the parallel reduction in Defence funding and the cancellation of the planned replacement for the Sunderland, the Short Shetland, and an interim development of the Sunderland named Sealand. It was clear therefore that the Sunderland would have to remain in service for some years yet. Moreover, the loss of the Fortresses and Liberators left Coastal Command in the same position that they had entered the War: lacking a suitable land-based MPA to complement its Sunderlands. Therefore, surplus Lancasters were pressed into Maritime service pending the development of a MR variant of the new Lincoln bomber, soon to be named the Shackleton.

More positively, Coastal Command retained the strong Joint connections with the RN which had proved so critical in facing the German U-Boat threat. These included the ASW Development Unit (ASWDU) at RAF Thorney Island which also included a RN component,⁶ and the Joint Anti-Submarine School (JASS) at Londonderry.⁷ The former focused on the development of a variety of radar and acoustics technologies while the latter provided annual courses for RAF Coastal Command and Fleet Air Arm crews as well as RN ships and submarines.⁸ However, not for the last time in its post-war existence, RAF MPA crews had seen a highly capable submarine threat disappear almost overnight; it would not be until the mid-1950s that Russian naval capabilities evolved to the extent that their submarines could credibly be deployed in the waters patrolled by Coastal Command. Therefore, ASuW would form the bulk of Coastal Command's initial post-war activity, albeit combined with some surprising diversions as the new World order established itself.⁹

Such anonymously named 'Reinforcement Flights' commenced in earnest in August 1947 when Lancaster GR3s deployed to Palestine on Operation BOBCAT searching for illegal Jewish immigrant vessels in the Eastern Mediterranean. BOBCAT was followed by further 'Reinforcement' operations across Africa¹⁰ where Lancasters and Sunderlands conducted ASuW and troop transport. However, it was the Berlin Airlift - Operation PLAINFARE - where Coastal Command Sunderlands were pressed into one of their more unlikely roles, flying supplies onto the River Elbe and Lake Havel.¹¹ The flying boats were particularly valuable for delivering bulk supplies of salt which corroded the airframes and control runs of land-based aircraft; up to 10,000lb of this precious cargo could be carried per Sunderland flight into the besieged city. Ultimately, 2,120 Sunderland sorties were flown on the Berlin Airlift which lifted a total of 5,429.5 tons;¹² 1,113 malnourished German children were also flown through the Soviet blockade on return flights.¹³

The formation of NATO in 1949 elicited an increased British commitment to the Eastern Atlantic as the Soviet threat grew and AOC-in-Chief (CinC) Coastal Command was appointed as the Alliance's Allied Air CinC, Eastern Atlantic, from 1951.¹⁴ However, it was in China that RAF maritime aircraft first engaged communist forces when HMS *Amethyst* was fired upon by Peoples' Liberation Army (PLA) artillery and ran aground on the Yangtse River on 21 April 1949. Following unsuccessful attempts by RN vessels to reach *Amethyst*, an 88 Squadron Sunderland conducted several landings next to the disabled RN ship over subsequent days. Despite being targeted and damaged by PLA gunfire itself, the flying boat successfully delivered an RAF medical officer, an RN chaplain, replacement crew and vital supplies before HMS *Amethyst's* eventual escape. 88 Squadron also evacuated over 100 British nationals from Shanghai ahead of advancing communist forces the following month.¹⁵ The Sunderland's involvement



A Shackleton MR1 passes over a submarine during a patrol in late 1952.

in Asia continued where it formed one of the few RAF contributions to the Korean War, operating from Japan on typically unglamorous but essential day and night interdiction of Yellow Sea blockade runners, and as a transport for UN troops. Meanwhile, Sunderlands also contributed to anti-communist operations in Malaya on Operation FIREDOG where they flew coastal patrols in conjunction with RN surface vessels along Malaya's eastern islands to prevent smuggling of terrorists and arms supplies. Nine lettered patrol areas were ultimately established and surveillance extended as far as 80 miles from the coast.¹⁶

At home, a long awaited Coastal Command re-equipment was commencing with the first flight in March 1949 of the Shackleton MR1, which entered RAF service in 1951. However, the Shackleton suffered significant development problems including Centre of Gravity (CofG), flight instrument errors and vibration.¹⁷ Crew comfort was also heavily criticised, particularly in

regards to the all-important crew galley and toilet, despite Avro publicity comparing its facilities to those of a hotel!¹⁸ Against these problems, Korea had highlighted the need for greater numbers of more modern MPA and 52 Lockheed P2V Neptunes were also ordered under the Mutual Defence Aid Pact with crews training in the US from September 1951.¹⁹ The situation was further complicated by significant political and inter-service wrangling of the sort which was to become an unfortunate feature for future generations of RAF MPA.

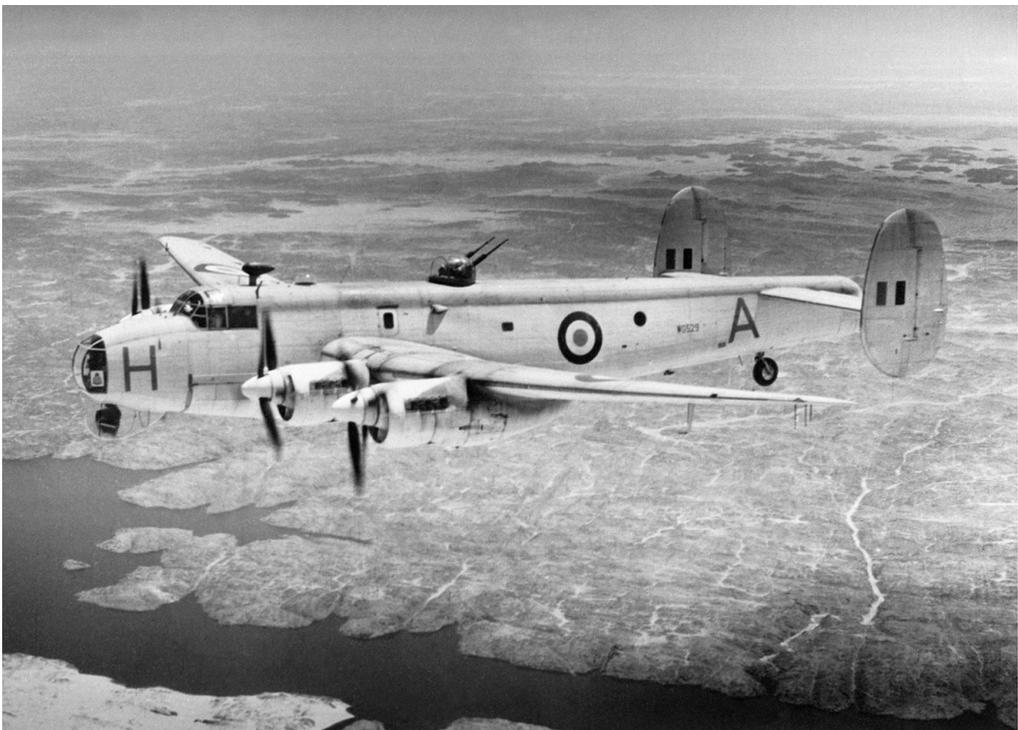
Firstly, with Sunderlands still providing stalwart service in Asia, a vocal flying boat lobby remained, led by British manufacturers Saunders-Roe and Shorts. This debate endured until the late-1950s, largely due to continued Admiralty emphasis upon their value in Pacific operations and political concern regarding the future of domestic flying boat production.²⁰ Indeed, as the Senior Service had done since the Command's inception, the RN attempted on numerous occasions up to 1955 to wrest control of Coastal Command from the RAF. Such moves were aided by misunderstanding caused by the 'Coastal' nomenclature, with the US particularly perplexed that MPAs fell under the RAF rather than the RN. Attempts to change the name to Maritime Command or Maritime Air Command were vetoed by the Air Staff on several occasions during the period, partly due to nostalgia and partly due to fears that it would encourage RN aspirations.²¹ The Admiralty and Air Ministry were more aligned about the mine threat to home waters and agreed that the RAF should operate land-based Short Range Maritime Reconnaissance (SMR) aircraft, leaving Shackletons and carrier-based Gannets to conduct North Atlantic patrols. Coincidentally, the Shorts Seamew was being developed for RN reserve squadrons for use from smaller RN fleet carriers and a modified variant was considered for the RAF. However, the type proved to have extremely poor handling characteristics with one test report stating 'Access to the...[Seamew]...cockpit is difficult. It should be made impossible!'²² Ultimately, the Seamew was cancelled for both Services, and Coastal Command's focus remained on larger MPAs.

Introduction of the Shackleton and Neptune progressed rapidly and highlighted challenges in several established aircrew trades. Air Engineers arrived for Shackleton conversion training having completed ground and flying training preparing them for the Lancaster.²³ However, navigators graduating from flying training in Southern Rhodesia were particularly sought after due to their exposure to navigation over large areas with few aids or identifiable points. Following a US/UK/Canada Sonobuoy Interoperability Agreement,²⁴ the first directional T9003 and active T1154 sonobuoys were also delivered to MPA squadrons from 1955 as part of the Mk1 Sonics system.²⁵ Further advances in technology were evident as the Neptune introduced Magnetic Anomaly Detection (MAD) while the Shackleton was equipped with Electronic Support Measures (ESM) and an improved Anti-Surface Vessel (ASV) Mk21 radar.²⁶ Such a broad suite of sensors was essential for MPAs to meet the emerging technology race with the Soviets. Passive systems such as ESM, MAD and passive 'listening' sonobuoys allowed the

detection of submarines and ships without compromising the aircraft's own presence. In contrast, active sensors such as radar and active 'pinging' sonobuoys provided warning of an MPA's presence to a target but could be employed for refining target data or sometimes to drive a submarine from an area.

Homing torpedoes were also supplanting World War Two era depth charges as the primary ASW weapon. However, cancellation of the experimental *Pantane* torpedo and upgrades to the British Mk30 weapons saw Coastal Command reluctantly adopt the less effective US Mk43.²⁷ Such technology dictated that acoustics and other skills should be added to the traditional 'dry' roles of Air Signallers whose training still emphasised communications and gunnery.²⁸ This resulted in changes to Air Signaller training which ultimately led to the Air Electronics Operator (AEOp) Trade and Air Electronics Officer (AEO) Branch.²⁹

Meanwhile, the definitive Shackleton MR2 was starting to enter service featuring an entirely redesigned nose and a retractable radar 'dustbin'. ASWDU trials suggested the MR2 was an excellent MPA although levels of crew comfort remained poor.³⁰ With Neptune squadrons now at full strength and increasing deliveries of the Shackleton, the Lancaster was finally retired from front-line Coastal Command service.



Shackleton MR1 pictured over the Nile, 22 April 1953, during the outward leg of 42 Squadron's goodwill tour to Ceylon and South Africa.

However, it was retained for SAR duties until 1956 as the replacement 'Lindholme' dinghy equipment for the Shackleton was not yet ready.

Despite such challenges, the Shackleton was deployed on a wide range of tasks supporting operations, exercises and what would today be referred to as Defence Engagement (DE). These included exercises with the Indian and Pakistani navies on the annual RN FLEETEX from Ceylon, or as a 'Royal SAR' asset for overseas flights by the senior members of the Royal Family.³¹ Indeed, Coastal Command adopted a formal 24 hour SAR standby commitment from 1952 with squadrons holding the duty for a week at a time in the UK; this task would remain until the withdrawal from service of the Nimrod MR2 almost 60 years later.

In the mid-1950s, the situation in Cyprus deteriorated rapidly with RAF MPAs conducting anti-smuggling patrols to reduce illicit supplies to EOKA separatists.³² When a state of emergency was declared across the island in November 1955, Shackletons augmented Transport Command in the trooping role, a secondary task repeated during the Suez Crisis of November 1956. However, Suez saw the type's first real commitment to warfighting operations with 37 and 38 Squadrons flying constant MR sorties from Malta along the coast of Egypt from September, as well as supporting Operation MUSKETEER landings themselves.³³ More active involvement was taken by Shackletons in Oman during 1958 where, in addition to their normal maritime roles, they were employed as conventional bombers against Omani Liberation Army guerrillas.³⁴ Further deployments were made to Jordan following a request for assistance from King Hussein of Jordan in July 1958, and Kuwait following Iraqi moves to annex the territory in 1960; such deployments went some way to restoring the reputation of Britain in the Arab world following the Suez debacle.

By now, sufficient Shackletons were in service - including the new MR3 with tricycle undercarriage - to allow the planned rundown of the Neptune squadrons in late 1956,³⁵ a measure expedited by US dissatisfaction over Suez.³⁶ Shackletons notably supported Operation GRAPPLE, the dropping of the first British H-bomb on Christmas Island in September 1958. Here the type conducted meteorological reconnaissance and surface surveillance to ensure no boats inadvertently strayed into the danger area prior to each rehearsal and test. During actual detonations, Shackletons were also employed as photographic platforms³⁷ following fitment of anti-flash curtains, which were found to deposit silver flakes throughout the cockpit after each blast!³⁸

In 1959, the final RAF Sunderland sorties were completed from Singapore and the Service's long association with flying boats ended.³⁹ Since 1945, Coastal Command had finally divested itself of pre-war types to become a wholly Shackleton MPA force. Throughout this difficult period, the Command's aircraft had been deployed throughout the World in peacetime humanitarian, Defence Engagement and nuclear testing

tasks as well as operational service in Korea, Malaya, Africa and the Middle East, while adapting to rapidly advancing ASW technology and political uncertainties. This had driven significant evolution in RAF aircrew structures which continue to influence the Service today. While there would be further challenges ahead, it would be the increasingly assertive 'blue water' Soviet naval threat which would next dominate RAF MPA activity.

1961-1981: SUBMARINE THREAT ASCENDANT

'I achieved the equivalent of a 'hole in one' when the...[Soviet]...submarine scraped along the buoy cable and cut off the hydrophone...'

Nimrod MR1 navigator.⁴⁰

Coastal Command entered the 1960s emerging from considerable turmoil following the rapid retirement of the Neptune quickly followed by the unexpected temporary grounding of nearly all Shackleton MR1s, MR2s and T4s due to the discovery of fatigue issues.⁴¹ Despite early problems, however, the MR2 and MR3 were now increasingly mature maritime assets which had also received several sensor and weapons upgrades including the introduction of the improved US Mk44 torpedo. The significance of ASW to UK Defence was increasing rapidly due to the decision by the Admiralty to establish liaison with the USN regarding the Polaris Submarine-Launched Ballistic Missile (SLBM) system;⁴² if the national deterrent moved to submarines, MPA would prove central to its security and credibility. As if to add focus to such considerations, the Cuban Missile Crisis of October 1962 saw RAF MPA squadrons surge to expand maritime patrols in NATO and Mediterranean waters.⁴³ Indeed, this coincided with a rapid increase in Soviet 'trawler' activity, particularly close to RN ports. Keeping track of such intelligence vessels - known as AGIs - became a regular feature of RAF maritime operations for the remainder of the Cold War.

As the RN looked to the future, so too did the RAF with studies for a Shackleton replacement. The Air Ministry considered several such concepts from the late 1950s and initially showed interest in NATO's NMBR2 requirement which resulted in the Breguet Atlantic, a purpose-designed MPA which ultimately entered service with France, West Germany, the Netherlands and Italy. However, Anglo-French politics resulted in the release of Operational Requirement (OR)350 which attracted a variety of unusual bids including a variable-geometry transonic Hawker-Siddeley MPA design. The requirement evolved via the June 1963 Air Staff Target (AST)357 and later Air Staff Requirement (ASR)381 for a new type to enter service from 1968.⁴⁴ Once again, various proposals were received including MPA variants of the VC10 and Trident.⁴⁵ By 1964, the Breguet Atlantic had again emerged as the firm RAF favourite with deliveries of 47 planned from 1966.⁴⁶ However, a late submission from Hawker Siddeley based on a marinised version of the Comet airliner - a type already in service with the RAF as a strategic transport

and SIGINT platform - appealed to a political desire to protect UK jobs. Of note, early plans for the HS801 'Maritime Comet' included a visual bomb aimer position beneath the cockpit designed to allow conventional bombing on 'internal security' and counter insurgency tasks, a requirement which was soon dropped.⁴⁷

Against these procurement dynamics, the Shackleton continued to meet a rapidly expanding Soviet maritime threat to the UK despite ongoing operations elsewhere. Arguably the best known was the so-called 'Indonesian Confrontation' of 1962-70, an undeclared-war with Indonesia whose objection to the creation of Malaysia precipitated a border war and insurgency designed to destabilize the new country.⁴⁸ Throughout the Confrontation, Singapore-based Shackletons conducted surveillance of Indonesian land forces as well as traditional MPA activities over the Straits of Malacca.⁴⁹ Meanwhile, the Rhodesian Prime Minister Ian Smith - himself a wartime RAF pilot - made a Unilateral Declaration of Independence on 11 November 1965 to avoid black majority rule despite UK demands for reform. As part of the ensuing embargo, Shackletons joined the RN in the 'Beira Patrol' to interdict Rhodesian oil smuggling via Mozambican ports. Flying from primitive conditions on the Island of Malagasy,⁵⁰ Shackletons maintained this patrol until 1972.

The Sharjah-based 'MARDET' conducted similar tasks throughout the 1960s to prevent arms smuggling into Gulf States and cover the withdrawal from Aden. However, these maritime operations were augmented by 'desert reconnaissance and tactical bombing'.⁵¹ The former was carried out at low level to identify rebel camel convoys moving into the Sultanate from Saudi Arabia or Yemen which would subsequently be interdicted by Trucial Oman Scouts. Villages and forts were also overflown to visually check whether flags being flown indicated allegiance to the Sultan or the rebels. Tactical bombing tasks were normally carried out over the rugged Jebel Akhdar in northern Oman with Shackletons carrying up to twelve 1,000lb bombs.⁵²

While such events attracted newspaper headlines, RAF Shackletons continued their more low-key patrols over the Atlantic and Mediterranean. Throughout the latter half of the 1950s, Soviet blue water naval power had become progressively more assertive under the leadership of Admiral Sergey Gorshkov. By 1960, he had created a 'combined arms force' of surface ships, submarines and land-based maritime strike bombers, all equipped with a variety of conventionally and nuclear armed Anti-Surface Missiles (ASMs). These were specifically designed to challenge USN carrier strike groups and NATO Nuclear Ballistic Missile Submarines (SSBNs).⁵³ Early Soviet nuclear attack (SSN) and SSBN submarines such as the November and Hotel classes respectively were far noisier than Diesel Electric submarines (SSKs) - which primarily radiated noise only while snorkeling - and comparable Western nuclear boats.⁵⁴ US developments in Low Frequency Analysis and Recording (LOFAR) technology allowed the development of static, sea-bed arrays known as the Sound Surveillance System (SOSUS)⁵⁵ to act as

'trip wires' betraying passing Soviet submarines. LOFAR allowed extremely long-range detection of the low frequencies associated with Soviet nuclear submarine machinery and revolutionised NATO ASW capabilities. Throughout the 1960s, SOSUS was secretly deployed across the Greenland-Iceland-Faroes-UK gap with access to such US technology being considered 'invaluable' to RN/RAF ASW operations. The first detections of Soviet SSNs occurred in 1962 and by 1968 SOSUS was proving capable of detecting the latest generation of Soviet 'Charlie' and 'Victor' classes.⁵⁶ That year also saw the formal establishment of a Joint US/UK SOSUS Project Team to oversee expansion of the network and the establishment of a 'Regional Evaluation Centre' at RAF Brawdy in Wales.

This era heralded increasing levels of sophistication in cooperation between RAF Shackletons and RN submarine forces exemplified by Operation CLASH in June 1964 against Soviet exercises in the North Atlantic. Prior to the exercise commencing, five squadrons of Shackletons operating from Scotland and Norway tracked initial Soviet surface and submarine deployments from the Murmansk area. Supported by US, Canadian and Norwegian forces, airborne ASuW was scaled back during the exercise itself to concentrate on detecting Soviet submarine barriers. This identified gaps in patrols and allowed several RN diesel-electric submarines to infiltrate the Soviet exercise area undetected and collect valuable intelligence.⁵⁷ One of the unique strengths of fixed-wing MPAs over submarines, ships and even ASW helicopters was agility. Once detected, a NATO frigate or submarine's location could be predicted within a relatively limited radius of action for a period, even if tracking was lost. In contrast, an MPA could appear in any area virtually unannounced due to its speed of transit which severely complicated Soviet planning. When combined with the persistence of RN surface and sub-surface assets - the latter of which also enjoyed stealth - the RN and RAF were increasingly acknowledged as amongst the most proficient of NATO ASW teams.

Despite the legacy of Empire and the Indonesian Confrontation persisting, by the late 1960s RAF Maritime operations were dominated by this Soviet threat and NATO tasks. The Shackleton was also approaching the twilight of its RAF maritime career as its replacement - by now named Nimrod - made its maiden flight on 23 May 1967.⁵⁸ As if to underline its decline, late 1967 saw a series of tragic accidents with the loss of 3 Shackletons and 27 aircrew; 2 further aircraft were lost in April 1968 with a further 11 killed.⁵⁹

On 14 June 1968, HMS *Resolution* - the RN's first Polaris SSBN - departed Faslane for its maiden patrol.⁶⁰ The same year saw the Labour Government's notorious Defence White Paper announced the cancellation of the RN's replacement conventional carriers and the withdrawal of British Forces from 'east of Suez.' While the Nimrod MR1 survived political scrutiny, it would be in greatly reduced numbers due to the claimed ability of

the new MPA to cover the area of 3 Shackletons.⁶¹ Moreover, numerous bases would be closed including RAF Ballykelly in Northern Ireland which had been a long-time RAF Maritime airfield. Indeed, on 1 April 1968, Coastal Command itself, along with Bomber and Fighter Commands, was subsumed into the new Strike Command with maritime tasks falling to 18 Group.

Just over 3 years after the initial contract for the type was signed, the first production standard Nimrod MR1 - XV230 - was delivered to the Maritime Operational Training Unit (MOTU) (shortly thereafter renamed 236 OCU) at RAF St Mawgan.⁶² By 1972, some 48 Nimrod MR1s⁶³ had been ordered to replace the Shackleton MR2 and MR3 in the MPA role. However, it would be some years before the Nimrod could assume all its forebear's responsibilities. Just as Lancasters had been retained in the SAR role during early Shackleton service, so too was the Nimrod unable to take on this role until 1972.⁶⁴ Operational roles also continued to fall to the older type as the Nimrod continued to be refined. These included critical contributions to the expansion of the SOSUS network in the Eastern Atlantic. To determine the optimum positions for SOSUS arrays, Shackletons conducted extensive acoustic propagation characterization of the North Atlantic under the highly sensitive Project NEAT.⁶⁵ It was some years before the Soviets became aware of this expansion of SOSUS and there was concern that the use of active sonar would be counter-detected by the target submarine and provide an indication that cross-cueing was occurring from such a sensitive source. Therefore, RAF MPAs sometimes had to prosecute SOSUS plots via passive means only to avoid compromising the advantage of such information.⁶⁶

However, the Nimrod MR1 rapidly established itself as an excellent MPA that increasingly outperformed NATO counterparts. Parallel to the type's assumption of the ASW task came the delivery of the first of some 213,000 Jezebel LOFAR sonobuoys which fed the Nimrod's AN/AQA-5 processing system⁶⁷ and a navigation system derived from that designed for the TSR2.⁶⁸ Despite initial teething problems, the Nimrod MR1 crew comfort and tactical displays were a significant improvement over the unpressurised Shackleton. Throughout the 1970s, further improvements were incorporated including Mk44 and newer US Mk46 ASW torpedoes and the Lindholme dinghy. In a war with the Warsaw Pact, nuclear depth charges would also have been employed and practice 'shapes' were sometimes carried for exercises and certification of air and ground crews.⁶⁹

Nevertheless, the relatively small numbers of Nimrods and the reduction in the RN's carrier capability dictated that additional RAF types had to be pressed into supporting maritime tasks. Luckily, the assumption of the nuclear deterrent by the RN had generated capacity in V-Force squadrons. Victors of 543 Squadron performed a dual radar/photographic role overwater while 27 Squadron was tasked with Maritime Radar Reconnaissance (MRR) employing modified Vulcan B2(MRR)s in a more general ASuW



27 Squadron Vulcan B2(MRR) modified for the maritime reconnaissance role pictured over the North Sea, 7 June 1976.

surveillance role relying on the type's H2S Mk9A radar and a variety of secondary sensors.⁷⁰ The Vulcan proved well suited to MRR tasks, particularly on 'Tapestry' patrols of oil rigs and during the Second Cod War when Icelandic Coast Guard vessels actively obstructed British and European trawlers in a bid to enforce claims to expanded fishing rights.⁷¹

The 1960s and 70s saw RAF maritime capabilities increase as the Soviet naval threat was redefined by Gorshkov. From a largely coastal force up until the mid-50s, the Soviet Navy was now able to deploy SSKs, SSNs and SSBNs of increasing sophistication throughout NATO waters. For the UK, the assumption of the strategic deterrent by the RN added yet further impetus to ASW tasks. Gradually, Coastal and Strike Command emphasis shifted from ASuW and policing the last vestiges of Empire to a role demanding increasingly sophisticated sensors, weapons and thinking. Moreover, while SOSUS and LOFAR technology ensured the West maintained a technological edge over the Soviets, access to such technology could only be secured by retaining credible Maritime capabilities in the eyes of the US. The introduction of the World's first jet powered MPA in 1969 reinforced the RAF's status within the Maritime world and NATO. However, political and inter-service tensions had continued to hinder MPA procurement. While the Nimrod MR1 was arguably the finest MPA in the World by the mid-1970s,

it was only available in relatively small numbers. In the next decades, a variety of unexpected World events would test that capacity to breaking point.

1982-2015: OUT OF AREA AND OUT OF SERVICE

'It was a gorgeous winter's day, with the sun shining and hardly any cloud to hide in...We felt just like a goldfish in a bowl...Normally the visual lookout is one of the less popular duties in the Nimrod. But while we were off the Argentine coast almost every piece of perspex on our aircraft had a pair of very intent eyes staring out from behind it.'

Wg Cdr David Emmerson, Officer Commanding the Operation CORPORATE Nimrod Detachment on Ascension Island, after a flight exceeding 19 hours on 15 May 82.⁷²

By 1980, operational Nimrod squadrons had been reduced to four spread between St Mawgan in Cornwall and Kinloss in Morayshire, with aircraft numbers further depleted by the diversion of low-hour airframes to the ill-fated Nimrod AEW3 Programme.⁷³ However, 35 aircraft were in the process of receiving a major upgrade to the definitive Nimrod MR2 with the first aircraft delivered in August 1979. The MR2 upgrade replaced the obsolete ASV21 radar - which had also been used by the Shackleton - with the EMI Searchwater, an AQS-901 acoustic processor to accommodate the data from more modern sonobuoys, and a replacement Loral 1017 *Yellowgate* ESM system mounted in new wingtip pods.⁷⁴

As deliveries of upgraded MR2s proceeded, Argentina invaded the Falkland Islands on 2 April 1982 and maritime squadrons prepared for an entirely unexpected conflict. On 4 April, 18 Group ordered 42 Squadron to deploy two MR1s, three crews and supporting ground crew to Ascension Island on Operation CORPORATE.⁷⁵ The first jet departed the following day and flew the initial operational sortie from Ascension on 7 April.⁷⁶ The MR1's contribution to CORPORATE was limited to uneventful ASuW/ASW patrols and SAR cover for deploying Harriers before they were replaced by MR2s from Kinloss from 13 April.⁷⁷ With remaining MR1s assuming all UK SAR and Tapestry commitments, further upgraded MR2s deployed to Ascension and immediately commenced communications relay support to Operation PARAQUAT, the retaking of South Georgia. Subsequent sorties from Ascension broadly fell into 3 categories: ASuW/ASW defence of Ascension Island, which was considered a possible target for Argentine air, naval or Special Forces (SF) attack; secondly, the Nimrods provided escorts and screening as the Task Force started its transit south; finally, Nimrod crews provided essential communications relay, radar control and SAR cover for Victor tankers and their receivers including Operation BLACK BUCK missions.⁷⁸

However, Nimrod MR2 support could only be conducted to approximately 2,000 nm from Ascension Island and the feasibility of adding an AAR capability was being

considered. To cover immediate long-range requirements, Victor K2s were pressed into the MRR role⁷⁹ around South Georgia and the Falklands from 20 April with several missions lasting over 14 hours.⁸⁰ The first Nimrod MR2P modified for AAR arrived at Ascension Island on 7 May and aircraft were soon ranging further south in support of the Task Force. One Nimrod mission proceeded to within 150 miles of Port Stanley before moving to approximately 60 miles off the Argentine mainland where it flew past every major Argentine port, in broad daylight and well within range of Argentine fighters.⁸¹ Although often finding little of significance, these sorties provided vital confirmation that the Argentine Navy had retreated to territorial waters following the sinking of the *Belgrano*.⁸² The longest Nimrod sortie conducted exceeded 19 hours and another saw the greatest distance covered in any Operation CORPORATE sortie: 8,453 miles.⁸³ The Nimrod MR2P was also famously equipped with AIM-9G Sidewinder air-to-air missiles in case of encounters with Argentine fighters or the Boeing 707 SIGINT platform. Both threats were detected on ESM during various sorties and the latter was visually acquired on one occasion; unfortunately, the Nimrod involved was not yet equipped with the Sidewinder modification.⁸⁴ Overall, Operation CORPORATE saw some 111 sorties from Ascension Island and the hasty introduction of AAR - a skill maritime squadrons had never previously employed - demanded much from crews.⁸⁵ Largely unsung and despite occasional RN misgivings, 18 Group Nimrods nevertheless contributed vital intelligence on Argentine movements which allowed scarce assets to be prioritised elsewhere.⁸⁶

Following Operation CORPORATE, Nimrod squadrons returned to their established NATO and national tasks where they faced the new generation of quieter Soviet submarines. Yet, older and noisier boats continued to be deployed, sometimes seemingly acting as decoys to allow more modern submarines to slip past SOSUS. This behaviour was perplexing until the FBI uncovered the Walker Spy Ring in 1985 and it became evident that the Soviets knew how NATO were tracking their earlier submarines.⁸⁷ The new generation of Soviet submarines included the Victor III SSN and Delta IV SSBN and proved far greater challenges; 'The Victor Is, Victor IIs, the early Deltas, Hotel, Echo, Novembers, all those were easy...then suddenly they turned out the Victor III...life got much harder.'⁸⁸ However, the introduction of new sonobuoy technologies such as the 'Barra buoy' and digital High Instantaneous Dynamic Range (HIDAR) passive systems on NATO MPAs eased concerns. When combined with the AQS-971 acoustic processor upgrade and continued efforts to maintain RAF 'wet' skills, parity was maintained in the final years of the Cold War. However, almost overnight, the collapse of Communism saw the Soviet submarine threat virtually evaporate, just as the U-boat threat had suddenly disappeared in 1945.

However, the instability of the post-Cold War world order soon saw RAF maritime crews returning to the Middle East. In August 1991, RAF Nimrods were committed to Operation GRANBY following Iraq's invasion of Kuwait. Operating from Seeb in Oman,

the aircraft initially enforced the UN embargo conducting Maritime Patrol and reporting any suspicious vessels in the Arabian and Persian Gulf to Naval forces.⁸⁹ Once hostilities commenced, RAF Nimrods were allocated ASuW tasks in the Northern Arabian Gulf by the USN.⁹⁰ As in 1982, Operation GRANBY saw a number of new systems introduced to the Nimrod including defensive aids, a Link 11 terminal which allowed access to naval and AWACS track data, and an Electro-Optical (EO) system named Sandpiper.⁹¹ During hostilities, MR2 Surface Picture ('SURPIC') data led to several successful engagements of Iraqi naval vessels by USN aircraft.⁹² Post-war, MR2s continued to contribute to the Gulf via Operation RESINATE and other discrete operations designed to support UN sanctions against Saddam Hussein's regime.⁹³

The 1990s saw a wide range of other operational commitments by the Nimrods including enforcing a UN blockade of the former Yugoslavia, a task which endured for much of the decade.⁹⁴ The main assets of interest in the Adriatic were Soviet era SSKs operated by the Yugoslav Navy which, although elderly, still presented a credible threat. Thus, Nimrods flew with war loads of 6 Stingray torpedoes although no engagements ultimately occurred.⁹⁵

Meanwhile, plans to replace the Nimrod were already in place. Focus initially fell on the Lockheed P-7 Long-Range Air ASW Capable Aircraft (LRAACA), a heavily modified, new build P-3 variant being developed for USN requirements.⁹⁶ However, LRAACA was cancelled in 1990 and RAF maritime squadrons faced another procurement challenge. The MOD then considered a variety of Replacement Maritime Patrol Aircraft (RMPA) alternatives including updated Atlantic and P-3 variants as well as a westernised version of the Russian Be-40 amphibian. However, it was a radically redesigned 'Nimrod 2000' which was selected in December 1996 with 21 scheduled for service entry from 2003.⁹⁷ This variant would entail a virtual complete rebuild with new wings and engines being attached to refurbished MR2 fuselages containing entirely new systems.

Following 9/11, and with the Russian submarine threat to British interests by now at unprecedentedly low levels, RAF Nimrods were committed to overland operations, first in Afghanistan and later in Iraq. This was a role which illustrated the versatility of RAF MPAs, yet would ultimately result in their demise. Operations over Afghanistan commenced within weeks of 9/11 with Nimrods largely supporting UK Special Forces (SF) during long sorties from Thumrait in Southern Oman alongside other RAF and USAF assets.⁹⁸ Such operations saw an enhanced EO system - the MX-15 - introduced on the Nimrod with SF 'riders' also exploiting the type's C2 capabilities to support their colleagues on the ground. MR2s also conducted more traditional roles off the Omani coast to interdict suspicious vessels in cooperation with Omani Coastguards.⁹⁹ In early 2003, three Nimrods and 4 crews deployed to Prince Sultan Air Base (PSAB) near Riyadh in preparation for Operation TELIC - the invasion of Iraq - where they joined possibly the largest collection of USAF and RAF ISTAR aircraft ever assembled. The invasion itself

proved to be a frustrating period for the MR2s due to a lack of suitable tasking.¹⁰⁰ However, it was after the initial invasion and as British troops found themselves mired in the increasingly complex ground situation in Iraq that the MR2 came into its own. Often tracking 'High Value Individuals' or conducting 'Pattern of Life' surveillance of suspect locations with its MX-15 for hours on end, the Nimrod proved indispensable to an increasing number of British Army and UK SF 'strike ops', particularly in Baghdad and Basra. This routinely required aircraft and crews to operate from Basra airport itself where the HQ of the British Army led Multi-National Division (South East) was located.



Nimrod MR2 at a base in the Middle East, 2008.

By 2005, the British ground involvement in Afghanistan had increased and Nimrod squadrons were facing conflicting demands from both Operation TELIC and Operation HERRICK. Missions during the latter also relied heavily on MX-15 but required routine use of AAR due to the duration of the sorties from Oman. It was on one of these missions, on 2 September 2006 that Nimrod MR2 XV230 was lost following an in-flight fire soon after having tanked.¹⁰¹ Despite the valiant attempts of the crew in fighting the fire, the aircraft exploded at 3,000ft while attempting an emergency diversion to Kandahar and all 14 crew members died. The findings from the subsequent Board of Inquiry highlighted significant airworthiness concerns which led to the Haddon-Cave inquiry and a fundamental redesign of UK military airworthiness procedures. For the Nimrod, Haddon-Cave was damning and questioned the type's basic airworthiness. Despite continued operations over Afghanistan and Iraq, as well as counter-drug operations in the Caribbean and UK, delays to the planned Nimrod MRA4 replacement meant that the MR2s were being expected to operate for far longer than anticipated. Ironically, this decade also saw signs of a revitalised Russian naval threat with increasing

numbers of incursions by surface and sub-surface vessels into NATO areas. Despite its age, the Nimrod MR2's acoustics capabilities routinely proved capable of maintaining track of the latest Russian SSNs that would sometimes be lost when handed to MPAs of other nations.

However, after several further incidents, the MR2 was retired in 2010 and the entire Nimrod MRA4 Programme cancelled in that year's Strategic Defence and Security Review. Although one of the most controversial decisions made by Defence in recent years, only a single production standard MRA4 had flown almost a decade after it was originally planned to have entered service. Moreover, there remained numerous, fundamental system and flight envelope problems to be resolved which raised question marks over the MRA4's airworthiness. For the first time in its history, the RAF suddenly found itself without a dedicated MPA. The author commanded the Squadron responsible for Nimrod MRA4 Operational Test and Evaluation between 2007-09 and regrettably feels that cancellation had been inevitable for some time. However, this does not alleviate the challenges of what has undoubtedly been the Service's most operationally damaging post-war 'capability holiday' in a decade which has seen Russian submarine technology erode traditional Western advantages to unprecedentedly low levels. Faced with new Russian designs such as the Yasen SSN and Borei SSBN, and the reliance on NATO allies to patrol UK waters, many rightly questioned whether the lack of an MPA had undermined the entire UK strategic deterrent.

Fortunately, the RAF immediately anticipated the need to regenerate an MPA capability and over 30 maritime aircrew were distributed amongst RAAF, RNZAF, RCAF and USN squadrons to retain operational skills. As these 'Seedcorn' personnel integrated into their host services, the RAF quietly set about preparing the way to procure a new MPA. Many commentators assumed that, even were the Service successful, only a cheaper MPA such as the CN295 would be affordable. This ignored the point that such types were effective ASuW assets but lacked both the capacity and endurance for 'blue water ASW.' For the UK, an MPA capability needed to cover the full spectrum of ASuW and ASW including the prosecution of highly advanced nuclear boats. In essence, this limited options to an 'all or nothing' choice of the P-8, with which RAF Seedcorn crews were becoming increasingly familiar. Indeed, these RAF personnel had significantly assisted USN P-8 trials as they brought MRA4 experience – a type which shared a common mission system with the Poseidon. In a final twist however, the Japanese P-1 became an extremely viable late contender for RAF requirements. This was the first purpose designed MPA since the Breguet Atlantic of the late 1950s and attracted significant interest from the Service. Following a visit to Japan by ACAS in 2014, RAF MPA specialists visited the Japanese Maritime Self Defence Force and Kawasaki to fly on the aircraft. Despite the P-1 exceeding the capabilities of the P-8 in some respects, several factors dictated that the P-8 remained the preferred option, not least that the RAF had numerous crew qualified on the US type.

Ultimately, SDSR15 confirmed the decision to order the P-8 Poseidon, the first of which will commence flying in RAF service in 2019, closing a critical gap in UK Defence which will have endured for almost a decade. Given a resurgent Russian submarine threat, the regeneration of the Service's 'Kipper Fleet' cannot come soon enough. Although only 9 strong, the RAF P-8s will likely continue to provide discreet (and often overlooked) operational capacity in a variety of roles for decades to come.

CONCLUSION

'We do feel the loss of the Nimrods. The Merlins don't have the legs.'

Capt P Halton RN, 2012.¹⁰²

The post-war history of RAF maritime operations has been uniquely challenging. Emerging from the Second World War as a powerful and effective ASW/ASuW force, Coastal Command rapidly contracted in size as Lend-Lease types and Commonwealth aircrews were released. Within months, Coastal Command was arguably ineffective for even peacetime tasks and it was several years before modern Shackletons and Neptunes arrived to address the imbalance. Throughout the 1950s, a 'Flying Boat Lobby' and RN attempts to seize control of Coastal Command complicated procurement efforts. Nevertheless, established World War 2 era types such as the Sunderland and Lancaster displayed their versatility in the maritime environment and on tasks such as the Berlin Airlift and 'Amethyst Incident'.

The late 1950s and 60s saw a rapid increase in the Soviet submarine threat with a commensurate rise in focus on NATO ASW tasks despite the legacy of Empire. Indeed, once the UK's strategic deterrent was assumed by Polaris, RAF MPA capacity became a crucial pillar of its credibility and proved essential to gaining access to critical related technology such as SOSUS. Yet, once again, political factors complicated the selection of a replacement MPA which eventually emerged in the form of the Nimrod MR1. However, the small numbers procured dictated the use of Victors and Vulcans in complementary roles. Nevertheless, Joint RN and RAF capabilities were now recognised as exemplars across NATO and amongst the finest in the World, capable of meeting the Soviet naval threat with confidence.

As the capability of Soviet nuclear boats increased to new levels, the Falklands Campaign of 1982 saw a return to the historic diversification of maritime roles with Nimrods exposed to Argentine fighter threats on exceptionally long AAR-supported sorties over the South Atlantic. This heralded a return to 'out of area' operations following the end of the Cold War including the Middle East and less familiar locations such as the Adriatic and Afghanistan. Instead of working with the RN and NATO navies, Nimrod MR2 crews now became instrumental to ground and SF operations in both Operations TELIC and HERRICK. The strategic shock of the XV230 tragedy, however,

precipitated the early demise of the MR2 fleet and cancellation of the Nimrod MRA4 due to continuing delays and unresolved problems. This time, historic MPA procurement problems resulted in the complete loss of the RAF's MPA capability, leaving UK defence and its strategic deterrent fundamentally compromised.

Just as the 'Cinderella Service' did in World War 2, post-War RAF maritime capabilities have often existed in the shadows. Despite procurement challenges, the RAF maintained a world leading capability in uniquely challenging and technically unforgiving Joint operations up to 2010. Throughout these decades, the 'Kipper Fleet' demonstrated versatility, adaptability and disproportionate influence in both the Joint arena and the structural evolution of its parent Service's aircrew cadre. It can be anticipated that the RAF's nine P-8s will soon excel in the maritime battlespace as they face new generations of Russian SSNs and SSBNs presenting a very real and present danger to our national interests. While other RAF communities are seeing the impact of increased Russian military activity in what some are already referring to as the 'Second Cold War,' the P-8 crews will share the same unique claim of their Nimrod and Shackleton forebears:

'To be within a button push of doing exactly what you would do in war gave a huge feeling of achievement. Whilst other Cold War warriors studied target maps, we were actually up against our potential foe, day after day'.¹⁰³

Nimrod MR1 Navigator

NOTES

¹ Tony Blackman, *Nimrod: Rise and Fall* (London: Grub Street, 2011), 78-79.

² Keith Wilson, *Avro Shackleton 1949-1991 Owners' Workshop Manual* (Sparkford: Haynes Publishing, 2015), 47.

³ Deborah Lake, *Growling Over the Oceans. Avro Shackleton: The Men and the Missions, 1951 - 1991* (London: Souvenir Press Ltd, 2010), 8.

⁴ Chris Ashworth, *RAF Coastal Command 1936-1969* (Sparkford: Patrick Stephens Ltd, 1992), 196.

⁵ Id.

⁶ 703 Sqn.

⁷ Chris Ashworth, *RAF Coastal Command 1936-1969* (Sparkford: Patrick Stephens Ltd, 1992), 198.

⁸ Ibid, 199.

⁹ Although Coastal Command conducted ASuW *surveillance*, the actual ASuW strike role was initially transferred to Bomber Command in the immediate post-war years. This was due to the rapid contraction and eventual disbandment of Coastal Command strike wings.

¹⁰ Ibid, 200.

¹¹ Chaz Bowyer, *The Short Sunderland* (Bourne End: Aston Publications Ltd, 1989), 129.

¹² T M Williams, *Air Ministry Publication 3257: A Report on Operation PLAINFARE* (London: HMSO, 1950), 520.

¹³ Chaz Bowyer, *The Short Sunderland* (Bourne End: Aston Publications Ltd, 1989), 131.

¹⁴ Chris Ashworth, *RAF Coastal Command 1936-1969* (Sparkford: Patrick Stephens Ltd, 1992), 204.

¹⁵ Chaz Bowyer, *The Short Sunderland* (Bourne End: Aston Publications Ltd, 1989), 128.

¹⁶ Malcolm Postgate, *The Malayan Emergency 1948-1960*, 131.

¹⁷ Chris Ashworth, *RAF Coastal Command 1936-1969* (Sparkford: Patrick Stephens Ltd, 1992), 16-17.

¹⁸ Deborah Lake, *Growling Over the Oceans. Avro Shackleton: The Men and the Missions, 1951 - 1991* (London: Souvenir Press Ltd, 2010), 22.

¹⁹ Chris Ashworth, *RAF Coastal Command 1936-1969* (Sparkford: Patrick Stephens Ltd, 1992), 204.

²⁰ Chris Gibson, *Nimrod's Genesis: RAF Maritime Patrol Projects and Weapons Since 1945* (Manchester: Hikoki Publications Ltd, 2015), 60.

²¹ Chris Ashworth, *RAF Coastal Command 1936-1969* (Sparkford: Patrick Stephens Ltd, 1992), p.208.

²² Chris Gibson, *Nimrod's Genesis: RAF Maritime Patrol Projects and Weapons Since 1945* (Manchester: Hikoki Publications Ltd, 2015), 71.

²³ Deborah Lake, *Growling Over the Oceans. Avro Shackleton: The Men and the Missions, 1951 - 1991* (London: Souvenir Press Ltd, 2010), 29.

²⁴ Clive Radley, *Sonobuoy History From a UK Perspective* (Camberley: Clive Radley, 2016), 55.

²⁵ *Ibid*, 57.

²⁶ Deborah Lake, *Growling Over the Oceans. Avro Shackleton: The Men and the Missions, 1951 - 1991* (London: Souvenir Press Ltd, 2010), 210.

²⁷ Chris Ashworth, *RAF Coastal Command 1936-1969* (Sparkford: Patrick Stephens Ltd, 1992), 210.

²⁸ Deborah Lake, *Growling Over the Oceans. Avro Shackleton: The Men and the Missions, 1951 - 1991* (London: Souvenir Press Ltd, 2010), 34.

²⁹ Both the AEOp and AEO aircrew categories survived into the 21st Century and their influence remains evident in the modern Weapons Systems Operator course content and sub-specialisations.

³⁰ Keith Wilson, *Avro Shackleton 1949-1991 Owners' Workshop Manual* (Sparkford: Haynes Publishing, 2015), 22.

³¹ *Ibid*, 34.

³² EOKA was a nationalist organisation with the goal of 'The liberation of Cyprus from the British yoke,' claiming to be 'anti-colonialist.' Although not stated in its initial declaration of existence, which was printed and distributed on 1 April 1955, EOKA also had a target of unifying Cyprus with Greece (known as *Enosis*).

³³ *Ibid*, 53.

³⁴ *Ibid*, 55.

- ³⁵ Chris Ashworth, *RAF Coastal Command 1936-1969* (Sparkford: Patrick Stephens Ltd, 1992), 212.
- ³⁶ Deborah Lake, *Growling Over the Oceans. Avro Shackleton: The Men and the Missions, 1951 - 1991* (London: Souvenir Press Ltd, 2010), 81.
- ³⁷ Keith Wilson, *Avro Shackleton 1949-1991 Owners' Workshop Manual* (Sparkford: Haynes Publishing, 2015), 44-47.
- ³⁸ Deborah Lake, *Growling Over the Oceans. Avro Shackleton: The Men and the Missions, 1951 - 1991* (London: Souvenir Press Ltd, 2010), 94.
- ³⁹ Chaz Bowyer, *The Short Sunderland* (Bourne End: Aston Publications Ltd, 1989), 139.
- ⁴⁰ Clive Radley, *Sonobuoy History From a UK Perspective* (Camberley: Clive Radley, 2016), 70.
- ⁴¹ Chris Ashworth, *RAF Coastal Command 1936-1969* (Sparkford: Patrick Stephens Ltd, 1992), 215.
- ⁴² Peter Hennessy and James Jinks, *The Silent Deep* (London: Penguin Books, 2015), 207.
- ⁴³ Chris Ashworth, *RAF Coastal Command 1936-1969* (Sparkford: Patrick Stephens Ltd, 1992), 218.
- ⁴⁴ *Ibid*, 219.
- ⁴⁵ Chris Gibson, *Nimrod's Genesis: RAF Maritime Patrol Projects and Weapons Since 1945* (Manchester: Hikoki Publications Ltd, 2015), 155.
- ⁴⁶ *Ibid*, 157.
- ⁴⁷ *Ibid*, 163.
- ⁴⁸ From the Federation of Malaya, Singapore and the protectorates of North Borneo and Sarawak, themselves collectively known as British Borneo.
- ⁴⁹ Keith Wilson, *Avro Shackleton 1949-1991 Owners' Workshop Manual* (Sparkford: Haynes Publishing, 2015), 57.
- ⁵⁰ Now Madagascar.
- ⁵¹ Deborah Lake, *Growling Over the Oceans. Avro Shackleton: The Men and the Missions, 1951 - 1991* (London: Souvenir Press Ltd, 2010), 111.
- ⁵² *Id.*
- ⁵³ John Jordan, *Soviet Warships 1945 to the Present* (London: Arms and Armour Press, 1992), 19.
- ⁵⁴ Peter Hennessy and James Jinks, *The Silent Deep* (London: Penguin Books, 2015), 324.
- ⁵⁵ *Ibid*, 325.
- ⁵⁶ *Ibid*, 327.
- ⁵⁷ *Ibid*, 278-279.
- ⁵⁸ Tony Blackman, *Nimrod: Rise and Fall* (London: Grub Street, 2011), 16.
- ⁵⁹ Chris Ashworth, *RAF Coastal Command 1936-1969* (Sparkford: Patrick Stephens Ltd, 1992), 114-115.
- ⁶⁰ Peter Hennessy and James Jinks, *The Silent Deep* (London: Penguin Books, 2015), 260.
- ⁶¹ Deborah Lake, *Growling Over the Oceans. Avro Shackleton: The Men and the Missions, 1951 - 1991* (London: Souvenir Press Ltd, 2010), 202.
- ⁶² Tony Blackman, *Nimrod: Rise and Fall* (London: Grub Street, 2011), 18.

⁶³ Ibid, 19.

⁶⁴ Deborah Lake, *Growling Over the Oceans. Avro Shackleton: The Men and the Missions, 1951 - 1991* (London: Souvenir Press Ltd, 2010), 211.

⁶⁵ Peter Hennessy and James Jinks, *The Silent Deep* (London: Penguin Books, 2015), 327.

⁶⁶ Ibid, 328.

⁶⁷ Clive Radley, *Sonobuoy History From a UK Perspective* (Camberley: Clive Radley, 2016), 59.

⁶⁸ Ibid, 67.

⁶⁹ Ibid, 69.

⁷⁰ <https://navalairhistory.com/2012/05/06/when-god-of-thunder-became-mighty-hunter>.

⁷¹ Chris Gibson, *Nimrod's Genesis: RAF Maritime Patrol Projects and Weapons Since 1945* (Manchester: Hikoki Publications Ltd, 2015), 186.

⁷² Jeffrey Ethel and Alfred Price, *Air War South Atlantic* (London: Sidgwick and Jackson, 1984), 93.

⁷³ 42 at St Mawgan which also hosted 236 OCU, with 120, 201 and 206 Sqns at Kinloss.

⁷⁴ Clive Radley, *Sonobuoy History From a UK Perspective* (Camberley: Clive Radley, 2016), 71-72.

⁷⁵ Rodney Burden, Michael Draper, Douglas Rough, Colin Smith and David Wilton, *Falklands: The Air War* (London: Arms and Armour Press, 1986), 401.

⁷⁶ Id.

⁷⁷ Ibid, 402.

⁷⁸ Id.

⁷⁹ 27 Sqn had disbanded in the MRR role on 31 March 1982, only days before the Argentine invasion.

⁸⁰ Rodney Burden, Michael Draper, Douglas Rough, Colin Smith and David Wilton, *Falklands: The Air War* (London: Arms and Armour Press, 1986), 394.

⁸¹ Jeffrey Ethel and Alfred Price, *Air War South Atlantic* (London: Sidgwick and Jackson, 1984), 93.

⁸² Sandy Woodward, *One Hundred Days* (London: Fontana, 1992), 97.

⁸³ Rodney Burden, Michael Draper, Douglas Rough, Colin Smith and David Wilton, *Falklands: The Air War* (London: Arms and Armour Press, 1986), 403.

⁸⁴ Tony Blackman, *Nimrod: Rise and Fall* (London: Grub Street, 2011), 154.

⁸⁵ Rodney Burden, Michael Draper, Douglas Rough, Colin Smith and David Wilton, *Falklands: The Air War* (London: Arms and Armour Press, 1986), 403.

⁸⁶ Sandy Woodward, *One Hundred Days* (London: Fontana, 1992), 209.

⁸⁷ Peter Hennessy and James Jinks, *The Silent Deep* (London: Penguin Books, 2015), 548.

⁸⁸ Id.

⁸⁹ Charles Allen, *Thunder and Lightning* (London: HMSO, 1991), 28.

⁹⁰ Ibid, 31.

⁹¹ Ibid, 34.

⁹² Ibid, 33.

⁹³ Tony Blackman, *Nimrod: Rise and Fall* (London: Grub Street, 2011), 86.

⁹⁴ Known variously as Operation MARITIME MONITOR, MARITIME GUIARD and SHARP GUARD.

⁹⁵ Tony Blackman, *Nimrod: Rise and Fall* (London: Grub Street, 2011), 120.

⁹⁶ Chris Gibson, *Nimrod's Genesis: RAF Maritime Patrol Projects and Weapons Since 1945* (Manchester: Hikoki Publications Ltd, 2015), 194.

⁹⁷ Ibid 195.

⁹⁸ Operations VERITAS, ORACLE and latterly HERRICK.

⁹⁹ Tony Blackman, *Nimrod: Rise and Fall* (London: Grub Street, 2011), 130.

¹⁰⁰ Ibid, 129.

¹⁰¹ A date which remains infamous within the Nimrod community due to the loss of XV239 and her crew during an air display in Toronto on 2 September 1995.

¹⁰² Peter Hennessy and James Jinks, *The Silent Deep* (London: Penguin Books, 2015), 17.

¹⁰³ Clive Radley, *Sonobuoy History From a UK Perspective* (Camberley: Clive Radley, 2016), 70.

THE ‘MOST DARING RAID’? THE ROYAL AIR FORCE, OPERATION BLACK BUCK AND THE FALKLANDS CONFLICT, 1982

By Dr David Jordan and
Wing Commander John Shields

Biography: Dr David Jordan is one of King’s College London’s air power subject matter experts based at the UK Joint Services Command and Staff College (JSCSC), Shrivenham. While at JSCSC he has served as the Air Warfare Historian for the Higher Command and Staff Course, is the academic director for the RAF Division at JSCSC and a co-director of the RAF Centre for Air Power Studies.

Biography: Wing Commander John Shields’ formative years in the RAF focussed on air defence duties in the Tornado F3. More recently, he has held posts on the Advanced Command and Staff Course Directing Staff and as an RAF Division Course Director. He has an MA in Defence Studies from King's College London and is in the latter stages of his CAS Fellowship PhD.

Abstract: As part of the joint response to the Argentine invasion of the Falkland Islands on 2 April 1982, the RAF launched Operation Black Buck, a series of remarkable long-range bombing raids against Port Stanley airport. However, claims as to the significance of the raids have varied from denunciation of the attacks as a failure when judged against bombing accuracy to declarations that the sorties ‘changed the outcome of the war’. This article analyses what the raids were for and what they achieved, arguing that attacking Port Stanley airport was a key element of the joint planning for the recapture of the Falklands and that the Black Buck sorties merit consideration as being amongst the Falklands conflict’s ‘most daring raids’.

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'Argentine use of Port Stanley airfield and its surveillance radars constrains all our operations, enables redeployment and resupply of Argentine forces and maintains Argentine morale.'

Initial Plan for Operation SUTTON,
Presented to Chiefs of Staff,
2 April 1982.¹

INTRODUCTION

The Argentine invasion of the Falkland Islands on 2 April 1982 brought about one of the most remarkable contributions to any air campaign in the RAF's history, with the Black Buck series of air raids against Argentine positions at Port Stanley airport. The attacks required the use of the Avro Vulcan bomber a matter of weeks before the projected retirement of the type from RAF service. To reach the Falklands from the only viable airfield from which to launch the attacks required a complicated air-to-air refuelling plan which could only enable a single aircraft to attack the target. To add to the challenge, the Vulcan's air-to-air refuelling capability had fallen into disuse, requiring the rapid regeneration of the ability to receive fuel in flight. This was not the only difficulty, since the Black Buck missions saw the use of conventional bombs on three occasions and the AGM-45 Shrike anti-radar missile on two, despite the Vulcan force having stopped conventional weapons delivery training some years before, and never being trained in the Suppression of Enemy Air Defences (SEAD) role at all. The fact that the Vulcans, supported by a significant proportion of the RAF's Victor tanker force, managed to carry out five attacks on targets in the vicinity of Port Stanley airport was an impressive achievement by any standard.

Unfortunately, the historical record pertaining to the Black Buck sorties has been patchy at best. Analysis of the raids has been bedevilled by misunderstandings and a curious mixture of excessive condemnation and praise. The first attack – Black Buck One – has dominated the literature since 1982, with the four other sorties which reached the islands being largely ignored with the exception of Black Buck Six, which concluded with the forced landing of the Vulcan in Brazil after its refuelling probe broke. The actual strategic significance of the raids has been only hazily understood in many quarters, and Operation Black Buck remains something of an enigma beyond the understandable 'Boys Own' element in the coverage of an array of impressive feats of airmanship by both bomber and tanker crews. The concentration upon the tactical level means that the effect of the raids has tended to be regarded through the metric of how many bombs were dropped and how many hit their targets. It is an undeniable fact that of the 63 bombs dropped by the Vulcan, only one weapon cratered the runway. This has been taken as a sign of failure, or at best, a disappointing outcome – but by the same token, the bomb which struck the runway on the first Black Buck raid was the *only* weapon to crater the runway despite multiple attacks by Sea Harriers and later RAF Harrier GR3s. The Sea Harriers of 800 and 801 Naval Air Squadrons (NAS) and Harrier GR3s from

Number 1(Fighter) Squadron RAF operating from the Task Force's two aircraft carriers (HMS *Hermes* and *Invincible*) delivered more than twice as many weapons as the Vulcan against Stanley airport for little apparent discernible effect beyond scarring the runway surface and alarming the Argentine troops in the vicinity, but the main focus of historians has been upon the apparent tactical failure of the Vulcan sorties. It was not long before the government was responding to questions from MPs in a rather downbeat manner – as the Parliamentary Undersecretary of State for the Armed Forces observed in one exchange, 'it is true that the attacks [against the airfield] were not as successful as one would have wished, all the bombs dropped in its immediate vicinity and caused immense disruption and casualties to the Argentines.'² The suggestion that Operation Black Buck was disappointing in its outcomes as a result of only a single bomb hitting the runway has generated some pointed remarks from a number of sources (often driven by service rivalry), but it is the contention of this article that such an approach to Black Buck is overly simplistic and adds more heat than light to the analysis of what the raids were for and what they in fact achieved.

This article seeks to offer a more nuanced appreciation of the role of the Vulcan during Operation Corporate, and to dispel some of what John Terraine would term the 'myths and anti-myths' about Black Buck. It demonstrates that rather than being nothing more than a pathetic attempt by the RAF to 'get in on the act', attacking Port Stanley airport was a central part of the joint planning for the recapture of the Falklands, and that the tactical outcomes of the raids need to be placed in the broader context of British planning and operational warfighting for Black Buck to be properly understood.³

WHY PORT STANLEY AIRPORT, AND WHY THE VULCAN?

Intelligence reports received in London on 31 March 1982 suggested that the Argentines were almost certain to invade the Falklands within the next 48 hours. To Prime Minister Margaret Thatcher's dismay, the consensus amongst her key advisers appeared to be that retaking the islands was an impossibility. This view was not shared by the First Sea Lord, Admiral Sir Henry Leach. Leach attempted to seek out the Secretary of State for Defence, John Nott, to offer his views, and on learning that Nott was in conference with the Prime Minister sought out the meeting and intervened. Mrs Thatcher was already uncomfortable with the suggestion that the Falklands could not be reoccupied, and Admiral Leach's advice that a Task Force could – and should – be assembled was met with Thatcher's approval and gratitude.⁴ What Thatcher described as 'feverish military preparations' began on 1 April, and it is significant to note that one of the first issues to be addressed by planning staffs was that of the possibility of air attack against Argentine targets. The initial assessment was pessimistic:

Air attacks on Argentine cities or ships in Argentinean waters would have to be launched from Ascension Island. Without air tanker support, because of the

distance involved in the approach, the aircraft would have to land on the South American continent, possibly Montevideo or Santiago. Thus, in the likely event of denial of use of airfields in South America, air attacks on Argentine targets are not feasible. Bombing or torpedo attacks could however be carried out on Argentine shipping in the South Atlantic within return range of Ascension.⁵

Even without the practical difficulties of carrying out bombing raids, attacking the mainland was not a particularly attractive option politically because of the risk of it appearing an excessive escalation. Nevertheless, press speculation that the RAF's Vulcan force might be used to attack Argentina was not actively discouraged by the newly-formed War Cabinet as it was appreciated that this would add a planning consideration for the Argentines to worry about. As discussions continued, consideration of the possible air effort against the Task Force was discussed. An analysis of the airfields available on the Falklands quickly concluded that only Port Stanley airport was capable of sustaining major operations, particularly in being able to 'take a large number of C-130 sorties' as well as receiving flights made by the lighter Fokker F-27 and F-28 transports in the Argentine inventory. It was estimated that at least a dozen flights bringing in some 200 tons of supplies per day for the Argentine garrison was possible.⁶ The prospect of using the airfield for combat operations was less clear.

Port Stanley airport was small, approximately a quarter of the size of a typical RAF runway and with limited parking. As a result, it was initially assessed as being unable to host Argentinean combat aircraft such as the Dassault Mirage III, Douglas A-4 Skyhawk, IAI Dagger and Dassault Super Etendard which might attack the British Task Force as it approached the islands. This assumed, however, that the Argentines did not undertake any attempts to extend the runway and the parking aprons, and the Chiefs of Staff had to assume that this would at least be given serious consideration. It was estimated that with some forward planning and work by Argentine engineers, it would be entirely possible to forward-base at least four combat aircraft at Stanley, giving some fighter defence capability to the islands. The only limiting factor was that of sortie rate, likely to be adversely affected by the availability of fuel for the aircraft.⁷ The airport could support the Argentines' Aermacchi MB-339, the Beech T-34 Mentor and the FMA Pucara, all of which could be used in the light attack role, and although these represented less of a threat to British naval units, they were still a concern, especially for the amphibious phase. A further factor regarding the airport then came into play when Defence Secretary John Nott raised concerns that it would provide the Argentines with a considerable propaganda coup were they to reveal that work had been undertaken to allow fast jet operations from Stanley.⁸ This concern was heightened by a worrying intelligence report:

There was positive intelligence that the Argentines intended to extend the Port Stanley airfield runway to 2,000m; work had probably started,

but the delayed arrival of heavy plant meant that concreting would not have been completed.⁹

It was clear that the runway at Port Stanley might present a considerable threat to British operations once the Task Force had arrived in the vicinity of the Falklands. Given that one of the key directives to be issued to the Commander-in-Chief-Fleet (Admiral Sir John Fieldhouse) for implementation by the Task Force Commander, Admiral John 'Sandy' Woodward, was to maintain control of the sea and air to enable the effective imposition of a Total Exclusion Zone around the islands, the airfield was becoming an increasing concern less than a week after the invasion.¹⁰ Attacking the airfield would support the need for sea control and control of the air; two prerequisites needed prior to an amphibious assault by British forces. Moreover, attacking the airfield would also compromise the Argentinean land force. Shutting the runway entirely would deny aerial resupply, while damaging it might create conditions in which the amount of materiel brought in by the Argentine air transport fleet was reduced. In such circumstances, the Argentine garrison would begin to suffer shortages, particularly if naval efforts reduced the amount of supplies brought in by ship. The question of how best to attack the airport was swiftly raised, and after consideration of Special Forces raids, the use of Naval Gunfire Support and air attack, the latter option was deemed the most likely to achieve the best effect.¹¹ The choice of platform to deliver the air attack was relatively straight-forward, being between the Sea Harriers aboard the Task Force's carriers, or the only available long-range attack aircraft, the ageing Avro Vulcan.

At the start of the Falklands Conflict, the Vulcan was in its last few months of military service. The Operational Conversion Unit, responsible for training Vulcan aircrew, had closed in August 1981 and three of the operational squadrons had retired since the beginning of the year.¹² The three remaining squadrons at RAF Waddington were due to disband in short order, with the last squadron disbandment planned for 30 June 1982.¹³ The fact that the Vulcan force was winding down did not dissuade the Chiefs of Staff and senior Royal Navy officers from considering that the Vulcan might fulfil a valuable role in the conflict, particularly when the importance of disrupting Argentine operations out of Port Stanley was fully appreciated.

Despite its age, dating back to requirement B35/46 from 1947, the Vulcan offered a number of capabilities not replicated by any other aircraft in the RAF inventory in 1982.¹⁴ For the vast majority of its career, the Vulcan's role was to deliver nuclear weapons. Its initial task was as part of the independent nuclear deterrent capability provided by the V-Force made up of Vulcan, Handley Page Victor and Vickers Valiant squadrons. In order to meet this task, a pre-determined number of Vulcan crews and their nuclear-armed aircraft were kept on a permanent very high readiness footing. The Vulcan B1 was soon joined in the front line by the more potent B2 variant initially armed with either Yellow Sun or Red Beard free-fall nuclear weapons.¹⁵ It was recognised from

an early stage, however, that greater stand-off capability was required to increase survivability against dense and sophisticated Soviet air defences. The Avro Blue Steel air-launched missile was therefore brought into service in early 1963 (although some were cleared for emergency use during the Cuban Missile crisis), but the weapon proved to be a disappointment to the Air Staff. The shooting down of Francis Gary Powers' U-2 in 1960 presaged a move to low-level attack, and this significantly reduced the range of Blue Steel. This was not regarded as a major setback to begin with, since it was planned to use the Vulcan to carry a pair of GAM-87 Skybolt ballistic missiles, one beneath each wing, giving the ability to launch weapons against the USSR outside the engagement envelope of Soviet air defence systems.¹⁶

The cancellation of Skybolt in 1962 caused consternation amongst the British government. The Kennedy administration had not understood the importance of Skybolt to British strategic planning, and in the aftermath of the cancellation, Prime Minister Harold Macmillan and President Kennedy met at Nassau and agreed that the United States would provide an alternative – but this was in the form of the submarine-launched Polaris ballistic missile system, which would render the airborne deterrence force redundant upon its service entry. Thus the Blue Steel-armed Vulcan's front line tenure was short-lived as the medium bomber force handed over the strategic deterrent role to the Royal Navy at midnight on 30 June 1969.¹⁷

While the drawdown of the V-Force in the aftermath of the Nassau agreement meant that the Victor bomber squadrons could be re-roled as air refuelling tankers (following the grounding of the Vickers Valiant, which had taken on the task as the number of Valiant squadrons employed in the bomber role reduced), the Vulcan's utility remained long after the strategic deterrent role had gone. The RAF's search for a long-range strike aircraft proved particularly painful. Cancellation of the TSR2 in April 1965 was mitigated by the decision to order 50 General Dynamics F-111s which would be joined in service by the result of an Anglo-French project, the AFVG (Anglo-French Variable Geometry). Unfortunately for the RAF, the financial crisis of the mid-1960s saw the F-111 order cancelled, while French interest in AFVG proved lukewarm, leading to cancellation. The RAF was forced to make use of the Blackburn Buccaneer, an aircraft which it had resisted buying for some years, partly because it lacked the assumed range of the TSR2, F-111 and AFVG. The Buccaneer turned out to be an effective servant for the RAF, but did not quite provide the long-range strike platform the Service desired. This gave the Vulcan a new lease of life.

With minor airframe modifications, a new weapon, minimal investment and change from high to low altitude operations, the Vulcan, in conjunction with the Buccaneers, could provide a cost-effective solution to the capability gap which would exist until the multi-national MRCA programme, which led to the Panavia Tornado, came to fruition in the 1970s. Consequently, until the Vulcan retired, it was envisaged that it would be a

low-level tactical nuclear bomber using the WE177C free-fall nuclear weapon. With the defence cuts of the 1960s removing Britain's so-called 'East of Suez' commitment, there was no requirement for the Vulcan to remain capable of mid-air refuelling nor, from 1976, the need to continue to train for the secondary conventional bombing role.¹⁸ Thus, in 1982, after nearly a quarter of a century dedicated to the nuclear attack role against a known Warsaw Pact threat, the Vulcan force was to be tasked to prepare for a long-range conventional attack against Argentinean-held territory. While this might make the choice of the Vulcan appear strange, when other factors are considered, the Vulcan in fact offered the only real option to deliver the effects that the Chiefs of Staff desired from an early air attack against Port Stanley airport.

As noted above, the only practical alternative to using the Vulcan was the employment of Sea Harriers from the two aircraft carriers, with the possibility of adding RAF Harriers to the attack once they had deployed to join the Task Force. This, in fact, was what initially transpired, with the joint effects of Vulcan raids and Sea Harrier/Harrier operations becoming a rather overlooked part of the air war. In mid-to late April 1982, the idea of Sea Harrier and Harrier attacks in addition to raids by Vulcans was not uppermost in the minds of senior naval officers. Their main concern was the thought of expending Sea Harriers on attacks against the airport. As shown below, this led to the interesting situation where the Chief of the Air Staff, concerned about the potential inaccuracy of an attack by a Vulcan and the risk of stray bombs causing civilian casualties, advocated the use of Sea Harriers to attack the airfield, while the Chief of the Naval Staff, supported by his colleagues, argued in favour of the Vulcan.

This led to the ironic situation that many members of the Royal Navy, unaware of the debate in London, saw Operation Black Buck as a wasteful effort to achieve doubtful results driven by a Chief of the Air Staff anxious to see his forces participate for reasons of Service politics, rather than driven by a Naval staff eager to take the opportunity to preserve their small and outnumbered Sea Harrier force for the vital defensive counter air role.¹⁹ This misperception continues, not least because after being persuaded that the Vulcan option was preferable by his naval colleagues, Sir Michael Beetham became an enthusiastic advocate for ensuring that Black Buck was properly supported.²⁰ As Beetham's biographer notes, his view was that the attack on Stanley airport was not an issue of Vulcan *versus* Sea Harrier, but a matter of ensuring that the full range of available air capabilities was used to support the recapture of the Falkland Islands.²¹ This nuance is frequently overlooked, and the narrative of an air force eager to get involved for the sake of it remains a depressingly simplistic feature of many accounts.

Beetham's argument that the Sea Harrier was a more accurate attack platform had a strong theoretical basis. David Castle, a Vulcan navigator who participated in two *Black Buck* missions, noted that the Circular Error Probable (CEP) of a Vulcan medium level radar attack was 1,900 feet, some 700 feet greater than the CEP for the Sea Harrier

stated by an RAF exchange officer flying the latter aircraft.²² Archival evidence also suggests that the Vulcan had a significantly poorer circular error of probability during low-level attacks than the Sea Harrier. During the Vulcan work-up training, a 750 foot circular error of probability was considered to be 'a reasonable estimate of delivery accuracy based on the trial results from Jurby and Garvie Island [bombing ranges] for low-level delivery.'²³ Yet, once again, the risk of attrition to the Sea Harrier force meant that the theoretically greater levels of accuracy which might be obtained by this type were considered less important than protecting critical assets. The difference between hitting the runway and actually closing it was not always appreciated in thinking about the raid, either before or since. The last experience that the RAF had of attempting to close a runway was during the 1956 Suez crisis, using Vickers Valiant bombers. The results had been disappointing, for although some bombs landed on the runways, Egyptian airfields were not closed altogether. Part of Beetham's considerations, even if not spelt out directly in the archives, lay in the fact that to shut the airfield and to keep it shut required continuous attacks. The Vulcans, operating from Ascension Island and consuming most of the available air-to-air refuelling effort in the process of reaching the islands, simply could not deliver the necessary sortie rate. Once in range of the islands, the Sea Harriers and later Harrier GR3s aboard the two aircraft carriers could keep up regular attacks with the aim of attempting to shut the runway completely. Thus using the Vulcan and the Harrier force in conjunction was a sensible means of at least disrupting Argentine use of the airfield, with the prospect of closing it to Argentine aircraft not being completely excluded.

Concern about the threat posed by Argentine air defences was well-founded. An eclectic and extensive array of Argentinean ground-based air defences had been assembled around Stanley airport. *Grupo de Artillería de Defensa Aérea 601* was the main anti-aircraft artillery unit, operating a single Roland 2 surface-to-air missile fire unit, a dozen Oerlikon twin 35mm anti-aircraft guns, three Oerlikon twin 20mm anti-aircraft guns and Tigercat surface-to-air missile launchers.²⁴ Although the majority of the fire units were used to protect Stanley, one 35mm anti-aircraft gun was deployed to protect Goose Green, where it proved a formidable – if ultimately unsuccessful – part of the Argentine defences, operating in the direct fire role against 2nd Battalion, the Parachute Regiment's troops.²⁵ A second, smaller army unit was also present at the airport and its environs, in the form of *Grupo de Artillería de Defensa Aérea 101* with eight Hispano HS-831 30mm cannons. They were supported by *Grupo 1 de Artillería Antiaérea* from the *Fuerza Aerea Argentina* which had nine Rheinmetall twin 20mm anti-aircraft guns and four Oerlikon twin 35mm anti-aircraft guns at its disposal.²⁶ Both services employed effective guidance systems; the army using the Skyguard fire control radar, and the *Fuerza Aerea Argentina* the Superfledermaus fire control radar to cue their guns.²⁷ As with *Grupo de Artillería de Defensa Aérea 601*, the focus of the *Fuerza Aerea Argentina* unit's efforts was the protection of Stanley, but six of the 20mm anti-aircraft guns were deployed to Goose Green.²⁸ No 1 Marine Air Defence Battalion provided the

naval contribution to the protection of Argentine key positions. The unit operated three Tigercat launchers and 12 Hispano HS-831 30mm cannons in and around Stanley.

The most modern and effective weapon system operated by the Argentineans was the Franco-German Roland 2 surface-to-air missile system. After initial British confusion regarding whether or not the Roland 2 system had been deployed to the Falkland Islands, a second and more fundamental question was raised – what was the engagement envelope of the system?²⁹ The Roland 2 was almost unknown to British operators, who found it, ‘difficult to obtain a definitive assessment of the engagement envelope of this missile.’³⁰ Indeed, the archives suggest that there was still considerable confusion over Roland’s envelope on the day after Black Buck One.³¹ The end result was a dangerous under-estimate of the Roland 2’s capability, which would lead to the loss of a Sea Harrier later in the campaign.³² Admiral Leach’s concern that the threat to attacking aircraft justified the use of the Vulcan rather than a formation of Sea Harriers (seven aircraft would have been required to deliver the same number of 1,000lb bombs as the Vulcan) was not unduly cautious. This highlighted the dilemma facing the Chiefs of Staff. Using the Vulcan could not guarantee to close the runway; indeed, experience suggested that while it might do so temporarily, re-attack would be needed. Yet to use Sea Harriers from the outset would dramatically increase the risk of attrition amongst the aircraft needed to protect the fleet from Argentine air attack.

The Chiefs of Staff also had to consider the views of the commander of TF317.8. Admiral Woodward was keen to see an attack launched against the airport even before the Task Force had come within range of the islands. On 11 April, he had requested plans for how to use his aircraft against targets on the islands and became an advocate for an early attack.³³

By 20 April 1982, planning for a landing on the Falklands (Operation Sutton) was well advanced. At the Chiefs of Staff meeting that morning, Sir Henry Leach reflected on the draft plan which had been submitted. He noted the importance of the airfield to the Argentine defences:

It would be vital to deny Port Stanley airfield to the Argentines as soon as possible, and certainly before the Carrier Battle Group arrived; only the Vulcans could do this, and in any case, the Sea Harriers should be conserved to support the landing.³⁴

ACM Beetham was still not entirely content, informing the meeting that he was of the view that the Sea Harriers would be most effective at putting the airfield out of action, and that while he was not denying that the Vulcans could also be successful, he remained concerned that an attack by a Vulcan would increase the risk of civilian casualties.³⁵ CAS was confident that the Vulcan could attack the airfield and other

targets on the islands, and of the potential effect of forcing some of the Argentine fighter force to be ready to defend the mainland against a possible attack, but there was still doubt in his mind as to the efficacy of the Vulcan vice Sea Harrier against the runway. Nevertheless, the Chiefs were unanimous in their view that it would 'be essential to neutralise the airfield and keep it neutralised', and this could only be achieved through air attack, although naval gunfire support would have a useful disruptive effect.³⁶ Quite what the Chiefs of Staff meant by neutralised – complete denial of the airfield or continuous, harassing attacks which would limit its ability to operate to full capacity, particularly if the runway were damaged – is not clear. References to 'denying' the use of the airfield either completely or just to fast jets, or rendering it 'inoperable' can also be located in the archives.³⁷ Whatever the exact intention, the importance of ensuring that the Argentines could not make unhindered use of Port Stanley airport was fully recognised. Beetham noted:

...if we were going to bomb the airfield with one thousand-pounders and put it out of action, I would have liked to have sent an absolute minimum of 25 and preferably 50, but it just wasn't a practical proposition.³⁸

Beetham's pessimism can be overstated. On 19 April, in a memorandum to John Nott, he outlined the benefits which might accrue from using the Vulcan:

With AAR support from Ascension [Vulcans] could be used to attack the airfield or other military targets on the Falklands. We could let it be known that we had a force of Vulcans on Ascension with the range to carry out attacks as far as the Argentine mainland posing a threat to their airfields and naval units in port. The Vulcans also have a MRR capability, and could give useful support to CTF. The Argentines would be aware of all these possibilities from published data on the Vulcan. Positioning some Vulcans at Ascension could also force the Argentines to maintain or deploy some of their fighters to the northern part of Argentina where they could not pose a threat to our TF in the area of the Falklands.³⁹

By 23 April, the die was cast: the Chiefs of Staff had agreed that it was essential to attack Stanley airport within a week to ten days to support the Task Force's efforts to create a Total Exclusion Zone by denying the airfield to fast jets (in fact, the Argentines had not given the extension of the runway proper thought, but this was unknown in London), and it would be attacked by Vulcans. Reports sent to Beetham between his slightly downbeat assessment on 20 April and the Chiefs of Staff meeting on 23rd had given him considerable encouragement, and he was described as 'an extremely hawkish proponent of the idea' of launching an early attack on the islands to support the Task Force. The Chiefs noted that the deployment of two Vulcans to Ascension Island could occur as early as 25 April if authorisation to deploy was granted on the 24th. A note to

John Nott sent on behalf of Admiral of the Fleet Sir Terence Lewin, the Chief of Defence Staff, informed him that a single Vulcan stood a 90% chance of causing one crater on the runway, with a 75% chance of a second bomb causing similar damage. An analysis of the proposed attack suggested that neither Port Stanley itself nor the outskirts of the town would be in the predicted impact area.⁴⁰ Although the Secretary of State for Defence was not being invited to authorise the attacks, he was asked to note that if an attack was conducted after 28/29 April, the air-to-air refuelling requirements for the raid would impinge upon the availability of tankers to support other operations, including the despatch of more Harriers from the United Kingdom to Ascension island.⁴¹

At this point, diplomatic considerations intruded. The airfield at Ascension Island was under American operational control, although there was no doubt that Britain had every right to use it to support the Falklands campaign. The problem lay in the fact that the US Secretary of State, General Alexander Haig, was attempting 'shuttle diplomacy' to prevent a war between two important allies of the United States. It was thought that launching a raid on the Falklands from Ascension while he was attempting to do this would be highly unhelpful to his cause, thus there was a delay in granting approval. On 27 April, Woodward lamented that any raid by the Vulcan would be 'too little, too late', and considered making use of his Sea Harriers if a raid were not authorised.⁴² With Haig's efforts at an end and the British government convinced that they would not bring about a satisfactory resolution, authorisation for the attack was granted. The first Black Buck sortie was launched on 1 May, coinciding with the arrival of the Task Force within range of the islands. The combined effect of the Vulcan raid and air combat between Sea Harriers and Argentine Mirage IIIs (the success of the Sea Harriers denting Argentine morale) marked the point at which a short, bitter conflict truly began.

BLACK BUCK

To meet the requirement for Vulcan attacks against the airfield at Stanley, a small cadre of crews from across the three remaining Vulcan squadrons was selected to undergo specific training in order to prepare for potential South Atlantic missions. The requirement for Vulcan air-to-air refuelling missions had lapsed in the post-Polaris era and with the ending of routine deployments 'East of Suez'. The crews had very limited experience in air-to-air refuelling and the aircraft required modification to refresh the lapsed capability.⁴⁴ Consequently, day and night tanking missions were conducted with the RAF Marham-based Victors from mid-April 1982, supported by experienced Victor Air-to-Air Refuelling Instructors flying on board the Vulcans.⁴⁵ Likewise, newly acquired conventional attack techniques were practised in a similar timeframe.⁴⁶

In addition to regenerating its air-to-air refuelling capability, other aircraft required attention. The long over-sea transit meant that the traditional method of radar navigation using ground features was not a viable option. Similarly, astro navigation was deemed to be too inaccurate to deliver the level of precision that navigation for the

mission required. However, Carousel navigation systems scavenged from former British Airways Vickers VC10s, held in storage at RAF Abingdon, provided the required solution.⁴⁷ Another equipment area that required immediate attention was the on-board jamming systems. Although the system was effective against legacy Soviet equipment, it was ineffective against emerging Soviet threats and the more modern Western systems such as those used by the Argentines. The solution was to borrow a more modern AN/ALQ-101D jamming pod, as used by the Buccaneer force, and then to integrate it onto the aircraft via the defunct Skybolt external hard points.⁴⁸

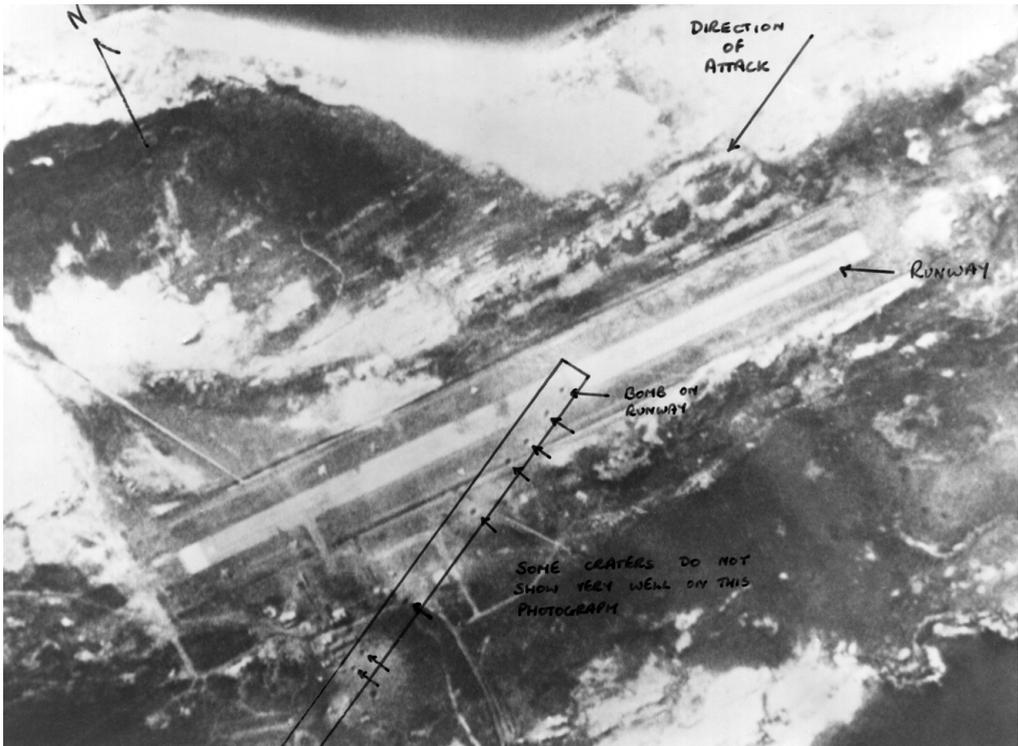
After an intensive training and engineering period, two Vulcans departed RAF Waddington and arrived at Wideawake Airfield on Ascension Island at 1800 on the evening of 29 April.⁴⁹ Aircraft parking space at the airfield was at a premium throughout the campaign.⁵⁰ Therefore, the number and type of aircraft held at Ascension Island had to be carefully orchestrated in order that the priority missions could always be delivered on time. As a result, the large Vulcans were not permanent residents at Ascension Island throughout Operation CORPORATE.⁵¹ When not in use, the aircraft would be flown north in order that Wideawake could be exploited by higher priority tasks such as Nimrod maritime radar reconnaissance missions and Hercules air drops, both of which required extensive use of the limited number of Victor air-to-air refuelling aircraft.⁵² Consequently, the Vulcan's participation was limited by two factors: available ramp space at Ascension and access to the required number



Vulcan B2, XM607, captained by Flight Lieutenant Martin Withers, crosses the threshold at Wideawake airfield on Ascension Island after successfully completing the Black Buck One mission.

of Victor air-to-air refuelling aircraft, which were heavily tasked supporting other aircraft and being used in a secondary radar reconnaissance role to supplement the efforts of the Nimrod force.

The full details of Black Buck One have been explored in considerable depth ever since the raid took place, and it is not necessary to offer a detailed narrative of events here.⁵³ The original plan to attack at low level was modified after consideration of the threat presented by Argentine GBAD, and after a low-level approach, the Vulcan climbed to 10,000 feet to release its weapons. A single 1,000lb bomb struck the runway, and caused a large crater. The Argentines filled the crater to allow the airfield to be used by transport aircraft, but the infill was of poor quality, and ensured that the runway's load-bearing capacity was reduced still further.⁵⁴ Two days later, a second sortie was launched, but with a slightly modified attack profile, with weapons release at 16,000 feet to avoid the threat from the Roland system. Frustratingly, the line of the stick of bombs was a few yards adrift of the runway, and while damage was caused to airfield facilities, the main aim of the raid of putting at least one more crater in the runway



This image taken by a Sea Harrier of the Fleet Air Arm on 1 May 1982 provided the first confirmation that the Black Buck One mission had successfully hit the runway at Stanley on the Falkland Islands. The craters left by the stick of twenty-one 1,000lb bombs can be seen running up from the bottom of the image.

was unfulfilled.⁵⁵ Frustration was further increased when Black Buck Three (13 May) and Black Buck Four (28 May) had to be cancelled as the result of excessively strong headwinds and a failure of a refuelling drogue on one of the Victor tankers respectively. Black Buck Four was notable for the fact that it was not aimed against the runway which was now being assailed by Sea Harriers and Harriers from the Task Force – but against the air defences around the airport.

DEFENCE SUPPRESSION

The threat posed by the Argentine radar systems had been a concern throughout the campaign, and by the middle of May, it was considered desirable for some attempt to deal with the airfield's defences to be made. This was not a straightforward proposition. In order to negate the Argentine surveillance radar systems, in particular the Westinghouse AN/TPS-43 radar that provided long-range detection and early warning of British air activity, the British required an effective suppression of enemy air defences capability.

Neither the Sea Harrier nor Harrier were cleared to use the one Anti-Radiation Missile (ARM) in the British inventory, the Martel. This was carried only by the Blackburn Buccaneer, and for primary use in suppressing the air defence systems of Soviet ships rather than land-based radar equipment. Integrating an ARM on the Sea Harrier or Harrier was not a priority given the clearance of other weapons and systems for both types. The Vulcan was deemed to be the most likely launch platform for the new mission. However, the weapon choice was more problematic. Consideration was given to equipping both the Vulcan (and, less obviously, the Victor) with Martel, and trials fits were carried out on both aircraft. In the case of the Vulcan, the missiles were fitted on improvised pylons mounted on the redundant hardpoints, Skybolt, and which had been used for the carriage of the hastily integrated electronic countermeasures pod on the first two Black Bucks.

Trials conducted in early May with the Martel proved to be unsuccessful.⁵⁶ Several concerns arose about Martel's suitability for use on the Vulcan, including the likely effect on weapon reliability after a 'cold soak' at altitude, and the realisation that there was no means of safely jettisoning the weapon in an emergency; in such circumstances, the only solution was to launch the Martel, which was considered highly undesirable, particularly if the need to clear the weapon from the aircraft arose overland and within range of a functioning radar site. A request was therefore made to the United States to access and use AGM-45A Shrike anti-radiation missiles. As each AGM-45A Shrike had a specific seeker that was capable of searching a defined band of the radar spectrum, there were a number of missile variants to choose from. The 'Dash 10' variant looked at the part of the spectrum where AN/TPS-43 early warning radar resided. In contrast, the 'Dash 9' variant of the AGM-45A Shrike specifically searched for the Skyguard and Superfledermaus radars that supported the anti-aircraft artillery.⁵⁷

As a result, the Vulcan had to carry a mix of 'Dash 9' and 'Dash 10' AGM-45A Shrikes in order that the full spectrum of Argentinean radars could be attacked.

The supply of missiles as well as aircrew and engineer training was supported by the visit to RAF Waddington of AGM-45A Shrike-equipped United States Air Force F-4G Phantoms from Spangdahlem Air Force Base in West Germany over the period 19-23 May.⁵⁸ Additionally, technicians from Naval Air Station China Lake, Nevada, assisted the endeavour.⁵⁹ The Vulcans were rapidly modified to carry a pair of AGM-45A Shrikes under each wing on the Skybolt wing pylons. However, due to the lack of time, aircrew training was minimal. David Castle suggests that his crew's training was limited to testing the missile seeker against the air traffic control radar at RAF St Mawgan in Cornwall as they flew from RAF Waddington to Ascension Island on 26 May.⁶⁰ Nevertheless, a second Vulcan crew were more fortunate as 'the Shrike ARM [anti-radiation missile] was test fired on 27 May after a rapid feasibility study, and deployed to Ascension Island on the same day.'⁶¹ The first attempt to attack the radars around the airfield on 28 May had to be aborted, and it was not until 31 May and Black Buck Five that the Vulcan's SEAD capability was tested. Two Shrikes were launched against the AN/TPS43 radar, but the Argentine operators switched off their radar while the Shrikes were in flight. The Shrike was a first generation ARM, and loss of radar signal meant that it was unlikely to hit its target; while the second missile failed to have any effect, the first of the two weapons landed some 10 yards away from the target and inflicted some minor damage to the system. This was not enough to prevent repairs being effected and the radar returning to use; it did have a salutary effect upon the Argentine radar crews who now had another challenge to deal with. On 3 June, Black Buck Six, again tasked in the SEAD role, attempted to locate the AN/TPS 43 system and spent a frustrating period attempting to detect signals; the operators, upon detecting the approach of the Vulcan, had wisely turned their radar off. Signals were then detected from a Skyguard radar, and two missiles were launched. The radar was hit and four of the operators killed. Despite this success, the mission is best remembered for the Vulcan being required to make an emergency landing at Rio de Janeiro in Brazil after its refuelling probe was damaged, making the transfer of fuel impossible. Further concern was caused as a result of one Shrike failing to jettison, leading to the missile being gingerly removed by members of the Brazilian Air Force and the aircraft's crew, making use of the appropriate parts of the weapons manual which had been faxed to the British defence staff at the embassy. After some diplomatic negotiation – and protests from Argentina that the aircraft and crew had not been interned – the Vulcan was released and flew back to the United Kingdom.

The final sortie was also marked by disappointment. Black Buck Seven was directed against Argentine troop concentrations around the airfield, rather than the runway. The mission, launched on 12 June 1982 was carried out when it was clear that the war would soon be over, and as the airport would be required for use by the British

forces, there was no wish to damage it further. Thus Black Buck Seven was meant to deliver airburst weapons. Here, the lack of regular training in the delivery of conventional weapons became an issue, and an error was made in fusing the weapons. They exploded on impact, creating the impression that another attempt at cratering the runway had failed to achieve its objective. The post-mortem on the attack, instigated by the Air Commander for the Falklands, Air-Vice Marshal Sir John Curtiss, concluded that the sortie had been planned in great haste, and that the confusion caused as a result had been the primary factor in the error over fusing.⁶² Two days later, the Argentine garrison on the Falklands surrendered, ending the Vulcan's brief combat career.

ATTACKS BEYOND THE FALKLAND ISLANDS?

Before assessing the effects of Operation Black Buck, it is worth considering another often overlooked part of the Vulcan's role in the Falklands conflict. There is a common perception that Vulcan attacks against the Argentine mainland were initially considered but quickly discarded in order to keep the conflict limited in nature and maintain international support for the British cause. There is significant merit in this view, and a number of contributions in the House of Commons by the MPs Tony Benn and Tam Dalyell illustrated the level of concern that existed in some quarters as to the possible effects of attacking Argentina itself, even if Benn's views tended towards the more doom-laden and extreme.⁶³ This concern was shared by the government, but even as late as 25 May 1982, four days after the British amphibious assault at San Carlos, the possibility of an attack being ordered against the mainland had not been rejected.

As a result, RAF Strike Command through No. 1 Group (which 'owned' the Vulcan force) was considering Vulcan attacks on the mainland, in particular the southern Argentine airfields that contained enemy ground attack and anti-ship aircraft. The evidence is patchy, but it appears that a surge in Argentine combat air efforts against the British landings, coupled with clearance on 21 May for the Vulcan to be fitted with a weapons load of three Paveway 1,000lb laser-guided bombs (LGB), gave rise to interest in exploiting the Vulcan's potential if required.⁶⁴ Consequently, the Vice-Chief of the Air Staff, Air Marshal Sir David Craig,⁶⁵ requested a paper updating the staff appreciation of using Vulcans against Argentine mainland airfields. The resulting report suggested that, 'attacks by Vulcan aircraft on the airfields at San Julian, Rio Gallegos and Rio Grande are feasible, and that attacking aircraft could recover to Ascension if a reduced 1,000lb bomb load or three laser-guided bombs were carried.'⁶⁶

Although the appreciation was clear that the standard Vulcan payload of twenty-one 1,000lb bombs would cause the maximum damage and would thus be preferable to the three laser-guided bombs, there was a major limitation. A Vulcan carrying a full load of bombs would require 20 tankers to support the mission, significantly more than the assumed 13 Victor air-to-air refuelling aircraft that would be available and

serviceable at Ascension Island. However, by reducing the bomb load to seven 1,000lb bombs or three laser-guided bombs, then a more viable 11 tankers would be required.⁶⁷

The presence of GBAD systems in the vicinity of the Argentine airfields, meant that bomb runs below 8,000 feet would be inadvisable.⁶⁸ Beyond the ground defences, there was also concern regarding the capability of Argentinean fighters. An intelligence assessment, drawing upon information from United States Air Force officers familiar with the Argentine Air Force suggested that the more experienced combat pilots were posted to Mirage squadrons and that their instrument and night flying standards were good.⁶⁹ Consequently, the report warned that the possibility of a Vulcan aircraft encountering fighter activity during the attack could not be ruled out. The effectiveness of fighter air defence at night was not easy to gauge as the report concluded that Argentine radar control and intercept capability was limited.⁷⁰ After considering all the factors involved, the recommendation offered by Air Commodore John Price, Director of Operations (RAF) in the Ministry of Defence, to Air Marshal Craig was to attack from, 'about 2,000 feet after a low-level penetration.' The preference was for the use of unguided weapons at that point, as suitable 'critical' targets for attack with LGBs had not yet been identified.⁷¹ Craig's assessment of the plan is not recorded. However, with Operation Sutton about to culminate and Argentine combat air power waning, but not yet defeated, the risks at the tactical, operational and strategic levels associated with a Vulcan raid against the Argentine mainland appeared to significantly outweigh the benefits. Nevertheless, the Vulcan's broader potential as a means of conducting the war was understood and considered even if it was not exploited.

EFFECTS & OUTCOMES

As noted at the beginning of this article, the effectiveness of Operation Black Buck has been subject to variable coverage in the historiography to date, ranging from condemnation of the attacks as little more than a pointless waste of fuel, through to 'the most daring raid' which 'changed the outcome of the war'.⁷² The truth almost certainly lies somewhere between the two.

There is little doubt that the raids, particularly the first, had important psychological effects on the enemy. The Argentine assumption that the British would not respond with force to the occupation of the islands was shattered by the first Black Buck raid, coupled with the air combats which occurred on 1 May, demonstrating that the British intended to fight for the islands; were there any doubts about this, the sinking of the ARA *Belgrano* on 2 May 1982 laid them to rest. The use of the Vulcan may have had a further psychological element, since the Argentines had attempted to procure a number of Vulcans from Britain a year before the war. It is not widely recognised that the Argentine air force had a heritage of operating bombers, beginning with the provision of fifteen Avro Lancasters and thirty Avro Lincolns which served with the *Fuerza Aerea Argentina*

until the late 1960s in the bomber, maritime reconnaissance, Antarctic exploration, target-towing, aerial photography and transport roles.⁷³

The role of the bomber in Argentine air power thought and practice was clear. While the procurement of the English Electric Canberra marked a step down from the 'traditional' heavy bomber, the heritage of possessing a bomber capability remained, offering a means of deterring and, if necessary, striking an enemy's homeland. In February 1982, as the retirement of the Vulcan was gathering pace – and while planning for the invasion of the Falklands was underway – the *Fuerza Aerea Argentina* expressed an interest in obtaining between six and twelve ex-RAF Vulcans during the course of 1983 to form a new squadron.⁷⁴ Remarkably, the British Defence Attaché in Buenos Aires reported that he had 'been unable to identify a specific role for these aircraft' but was 'convinced that they would be inappropriate for use in any adventure against the Falkland Islands'.⁷⁵ The reason for acquiring the Vulcan was assumed to be for deterrence purposes or possible use against Chile, with which Argentina had an ongoing territorial dispute over the Beagle Channel.⁷⁶ While this assumption was viewed with some scepticism elsewhere within both the Ministry of Defence and the Foreign and Commonwealth Office, the proposed sale foundered on the fact that British Aerospace decided that they had no desire to engage in the modernisation or ongoing support of the Vulcan, making it impossible for the Argentines to make use of the aircraft.⁷⁷ While it would be easy to make too much of this, it does not seem unreasonable to suggest that the fact that the Argentines had a healthy respect for the Vulcan and an understanding of its capabilities gave Black Buck an additional – if slight – level of psychological effect beyond that experienced by the Argentine troops during the Black Buck raids.⁷⁸

A further question concerns the suggestion that the greatest value of Operation Black Buck was that it compelled the Argentines to withdraw their Mirage III force from the fighting to provide air defence of Buenos Aires, thus giving the British a critical edge in the struggle for control of the air around the Falklands. This view is promoted by some sources, and dismissed by others who regard the Operation as a failure and a waste of fuel.⁷⁹ Certainly, Sir John Curtiss, the RAF's Air Component Commander, felt that the raid had achieved some sort of effect on the Argentine fighter force, given the paucity of Mirage III sorties over the islands.⁸⁰ Again, the truth appears to be more complex than the entrenched views on either side of the debate, since the aim of Black Buck was about far more than compelling the withdrawal of the Argentine Mirage III force, and any effect here was an added bonus, as Admiral Woodward observed:

'My dark blue aviators said "Oh, it's the air force just trying to get in on the act", but I said, hang on a minute, there will be two things. If they do hit the runway, that can't be bad, they can disrupt it... but also it will have exactly that effect of causing them [the junta] to think they could come at us on the mainland. It is showing reach and therefore it is deterrent. And I suspect it made them hold

back some of their Mirages, which could have acted as top cover for their A-4 raids. So I signed up for it and told my aviators to shut up.⁸¹

Admiral Woodward's view that the raids might force the Argentines to think about risks of an attack on the mainland – and as demonstrated above, this had not been completely ruled out of British planning – and take precautions was not unreasonable. While what may have appeared to have been Argentine fighters heading north to defend the capital was a misreading of the way in which their air forces were deployed, there is evidence that the raids had exactly this effect, with a small number of Mirage IIIs and Dagger fighter bombers being tasked with maintaining an air defence commitment.⁸² In addition to misunderstanding the way in which the Argentines apportioned their aircraft, criticism that Black Buck One saw the diversion of 'just four Mirages for defence of the capital' rather overlooks the fact that this was 25 per cent of the available force (and more after the losses of 1 May).⁸³ This perhaps demonstrates the difficulties of attempting to measure success purely through statistics, a problem which has affected analysis of air power effects from the First World War onwards.

The question of Operation Black Buck's efficacy during the war is perhaps best considered through the lens of its place within the overall construct of operations. As noted earlier, Black Buck was conceived as the result of concerns about the value of Stanley airport to the Argentines and the risks which it posed. It was not a vainglorious bid by the RAF to 'get involved', but part of an overall plan to reduce the possible threat from Argentine use of the airport. The advice from the Chief of the Air Staff as to the difficulties of guaranteeing success at closing the airfield were absolutely clear, but the Chiefs of Staff as a whole concluded that the potential outcomes were worth the effort. Yet they were sanguine about the possibilities, and never sought to convince themselves that there would be a decisive effect against the airfield with either the Vulcans or raids by carrier-borne aircraft. They were wise to do so. Despite Black Buck, raids by both Sea Harriers and Harriers and naval gunfire 'inspection of Port Stanley airfield by RAF LO [Liaison Officer] indicate[d] full runway length of 4,100 feet to be serviceable but fuel handling equipment, ATC [Air Traffic Control] tower and hangars badly damaged.'⁸⁴ Despite the damage, the airport remained operational, albeit in a much more limited manner.

In truth, the prospects of spectacular success from Black Buck were never particularly high in the absence of either a specialised anti-runway weapon or a precision strike capability. Measuring the extent of their effect on the campaign remains difficult, with the fixation upon only the first of the five sorties to attack the islands clouding the issue further. There is little doubt that Black Buck One was a clear demonstration of British intent. There is some evidence to suggest that Black Bucks One and Two confirmed Argentine fears that the mainland might be vulnerable to attack, reinforcing the requirement for maintaining a small cadre of aircraft for defence of the homeland

rather than using them over the islands, but not to support Air Marshal Curtiss' view that the entire Mirage III force was kept back as a result; other factors such as a lack of time on station also played a part in their absence from much of the fray. Taken as a whole, there is also evidence to suggest that the Black Buck sorties met their task of impeding and disrupting Argentine operations from the airport, but without achieving any significant effect beyond this – rather as the downbeat assessment of the Chief of the Air Staff when first debating the use of the Vulcan suggested might be the case. This obscures an important point, though, which lies in Beetham's memorandum of 19 April to John Nott. This highlighted the possible effects that might be achieved beyond just the 95% chance of hitting the runway with a single bomb. It has been slightly fashionable in some circles ever since 1982 to disregard the notion of Black Buck fitting into an early construct of effects-based operations. It appears that the Chiefs of Staff in 1982 (and Admiral Woodward) were thinking of air power for strategic effect in a manner which is not normally associated with air power thought at the time. The fact that the Argentines were not only unnerved by the Vulcan raid but also found that the crater from Black Buck One impinged upon their air operations is borne out by an Argentine report captured by the British which suggested that only 70 tonnes of cargo and 340 personnel were flown into the islands after Black Buck.⁸⁵ If this was correct, it suggests that the attacks (and those by the Sea Harriers and Harriers) meant that the regular flights by Argentine transport aircraft were far more heavily constrained than has often been assumed, demonstrating that effect may not always be obvious.

It may be that the greatest points of significance of Operation Black Buck lay beyond the Falkland Islands. Consideration of the use of precision weapons for attacks against the mainland, coupled with the actual use of LGBs in the dying stages of the conflict pointed to the future for the RAF, but this was but dimly understood. While it is interesting to speculate upon the effects of Black Buck had the Vulcans carried LGBs (and a means to designate them been supplied) rather than unguided weapons, the more important point was the demonstration of the need to ensure that key capabilities to achieve desired effects are funded appropriately, both in terms of equipment and training. Perhaps the final point of note was that Black Buck highlighted the adaptability and resourcefulness of the Royal Air Force and its personnel. While the claim made by media sources that Black Buck 'changed the war' are unsustainable, there is little doubt that all five Black Buck sorties merit consideration as being amongst the Falklands conflict's 'most daring raids'.

NOTES

¹ The National Archives (hereafter TNA), FCO 7/4472, Falkland Islands Conflict: Minutes of Chiefs of Staff Meetings. The Foreign and Commonwealth Office files covering the Chiefs of Staff Meetings in 1982 were declassified some time before those from the Chiefs of Staff Committee entered the public domain.

² TNA, AIR 20/13113, Operation Corporate, Falklands Conflict: bombing raids on Port

Stanley airfield.

³ John Terraine, *The Smoke and the Fire: Myths and Anti-Myths of War 1861-1945* (London: Sidgwick and Jackson, 1980).

⁴ Margaret Thatcher Foundation, 'Argentina Invades the Falklands' <https://www.margaretthatcher.org/document/109110> (accessed 2 April 2018). Different accounts regarding the meeting vary on a number of details, but all agree that Admiral Leach's intervention convinced Mrs Thatcher that her response – that the islands must be retaken by force if diplomatic efforts did not compel a complete Argentine withdrawal – was correct. The doubts amongst her cabinet and various officials were swept aside.

⁵ TNA FCO 7/4472, Minutes of meeting of Defence Operations Executive 31 March 1982

⁶ TNA FCO 7/4472, 'Airfields in the Falkland Islands' no date.

⁷ Ibid.

⁸ TNA FCO 7/4472, COS 12th Meeting 9 April 1982.

⁹ Ibid.

¹⁰ TNA FCO 7/4472, Draft Operational Directive.

¹¹ TNA FCO 7/4472, *passim*.

¹² Andrew Brookes, *Vulcan Units of the Cold War* (Oxford: Osprey, 2009), 66.

¹³ TNA AIR 20/13113, Operation Corporate, Falklands Conflict: bombing raids on Port Stanley airfield.

¹⁴ TNA AVIA 54/95, Design Branch Specification B35/46: medium range bomber.

¹⁵ CG Jefford, 'The View from the Back – The Vulcan Nav/Attack System' *Royal Air Force Historical Society – The Vulcan* (2014), 57.

¹⁶ Brookes, *Vulcan Units*, 25. Jefford. 'View from the Back' 57.

¹⁷ Nigel Baldwin, "The Post-QRA Era, 1969-1984" *Royal Air Force Historical Society – The Vulcan* (2014), 65; RAF Historical Society, *RAF Historical Society Journal 11 – Air Force Policy in the 1950s and 1960s*" <http://www.rafmuseum.org.uk/documents/Research/RAF-Historical-Society-Journals/Journal-11-Sir%20Frank-Cooper-on-Air-Force-Policy-in-the-1950s-1960s.pdf> (accessed 17 January 2016).

¹⁸ TNA AIR 27/3577, No 44 (Rhodesia) Squadron (Falklands Conflict).

¹⁹ Lawrence Freedman, *The Official History of the Falklands Campaign, Volume 2*, (New York: St Martin's Press, 1992), 282.

²⁰ Freedman, *Official History, Volume 2*, 281.

²¹ Peter Jacobs, *Stay The Distance* (London: Frontline books, 2011), 235.

²² Tony Blackman, *Vulcan Boys* (London: Grub Street, 2014), 175.

²³ TNA, AIR 20/13047, Operation Corporate (Falklands Conflict): Vulcan aircraft operations, including Black Buck operations, 'Analysis of Vulcan Low Level Bombing Results', Dr J Moffat, Science (2) RAF, 29 April 1982

²⁴ Chris Hobson and Andrew Noble, *Falklands Air War* (Hinkley: Midland, 2002), 43.

²⁵ R.O. Moro, *The History of the South Atlantic Conflict* (New York: Praeger Publishers, 1989), 99.

²⁶ Hobson & Noble, *Falklands Air War*, 43.

²⁷ Ibid.

²⁸ Moro, *History of the South Atlantic Conflict*, 99.

²⁹ TNA, AIR 20/13046, Operation Corporate (Falklands Conflict): Vulcan aircraft operations, including Black Buck operations, 'Vulnerability of the Vulcan to AAA when Attacking Port Stanley Airfield', 30 April 1982.

³⁰ Wing Commander CG Jefford, 'Vulcan Operations in the Falklands,' in *RAF Historical Society Journal 20 – Training in Peace for War*, 37 (<http://www.rafmuseum.org.uk/documents/Research/RAF-Historical-Society-Journals/Journal-20-Seminar-Training-in-Peace-for-War.pdf> (accessed 27 September 2016)).

³¹ TNA, AIR 20/13046, Operation Corporate (Falklands Conflict): Vulcan aircraft operations, including Black Buck operations, handwritten note to Strike Command from AFOR (RAFO 2 May 1982).

³² Ward, *Sea Harrier over the Falklands*, 310; TNA, AIR 20/13046. Operation Corporate (Falklands Conflict): Vulcan aircraft operations, including Black Buck operations; Hobson & Noble, *Falklands Air War*, 113.

³³ Freedman, *Official History, Volume 2*, 277.

³⁴ TNA, FCO 7/4473, Minutes, Chief of Staffs Meeting, 20 April 1982.

³⁵ *Ibid.*

³⁶ *Ibid.*

³⁷ See, for example, TNA FCO 7/4609, A Military Appreciation of the use of Vulcans for an Attack on Stanley Airfield, no date, but between 20-23 April 1982.

³⁸ MRAF Sir Michael Beetham, in 'The Falklands War', seminar held 5 June 2002 at JSCSC Shrivenham (Transcript in Andrew Dorman, Michael D. Kandiah and Gillian Staerck (eds), *The Falklands War*, CCBH, 2005) 39.

³⁹ TNA AIR 41/95, *Air Historical Branch Narrative of RAF Operations during the Falklands Conflict, 1982*, D of S Pol/38/2/5.A, Encl 14, CAS 90885 19 April 1982, CAS to Secretary of State for Defence.

⁴⁰ TNA FCO 7/4609, note to Secretary of State, 'Deployment of Vulcans to Ascension Island', 23 April 1982.

⁴¹ *Ibid.*

⁴² Freedman, *Official History, Volume 2*, 277.

⁴³ *Ibid.*

⁴⁴ Only one of the chosen Vulcan aircrew had previous air-to-air refueling experience but this dated back to 1962, a 20-year sabbatical. Rowland White, *Vulcan 607* (London: Corgi Books, 2007) 101.

⁴⁵ The experience and knowledge of the instructors was deemed so beneficial that it was decided that they would join the 5-man Vulcan crew on the Black Buck missions. Martin Withers. "The Vulcan Bomber in Action – Operation Black Buck", *Royal Air Force Historical Society – The Vulcan* (2014), 107.

⁴⁶ TNA, AIR 27/3577, No 44 (Rhodesia) Squadron (Falklands Conflict), F540 Record of Events, April 1982.

⁴⁷ R.A. Burden et al, *Falklands – The Air War* (London: Arms and Armour Press, 1986), 363.

⁴⁸ Hobson & Noble, *Falklands Air War*, 41.

⁴⁹ Burden et al, *Falklands – The Air War*, 363.

⁵⁰ RAF Historical Society, *RAF Historical Society Journal 30 – The Falklands Campaign*, <http://www.rafmuseum.org.uk/documents/Research/RAF-Historical-Society-Journals/Journal-30-Seminar-The-Falklands-Campaign.pdf> (accessed 20 November 2015).

⁵¹ For example, following the Black Buck 2 mission, both Vulcans returned to RAF Waddington on 7 May with two Vulcans returning to Ascension Island on 14 and 15 May in time to meet the Black Buck 3 task. Burden et al, *Falklands – The Air War*, 365.

⁵² Extended range Nimrod missions using Victor air-to-air refueling commenced on 9 May. *Ibid*, 395. Long-range Hercules air-drop missions started on 16 May. Hobson & Noble, *Falklands Air War*, 70.

⁵³ See, amongst others, White, *Vulcan 607*; Alfred Price, 'Black Buck to the Falklands', *RAF Air Power Review* 5:2 (2002), 1-11; Malcolm English, 'Operation Black Buck: the RAF Vulcan Raids on Port Stanley airfield', *Air Pictorial*, July 1982, 248-252, and 'The Falklands' Most Daring Raid', a Channel 4 documentary based upon White's book (first shown in the United Kingdom on 18 March 2012).

⁵⁴ See Major D I Reid, 'Stanley Airport – Airfield Damage Repair', *The Royal Engineers Journal*, Vol 97 No.1 (March 1983), 6-15 and Lt Col P R Ievers, 'The Airfield', *Royal Engineers Journal*, Vol 97 No.2 (June 1983), 80-88.

⁵⁵ Freedman, *Official History, Volume 2*, 301.

⁵⁶ *Ibid*, 365.

⁵⁷ TNA, DEFE 58/282, Operation *Corporate* (Falklands Conflict): Air Commander's Report; Report of Proceedings.

⁵⁸ Hobson & Noble, *Falklands Air War*. 101.

⁵⁹ Blackman, *Vulcan Boys*, 134.

⁶⁰ *Ibid.*, 179.

⁶¹ TNA. DEFE 58/282. Operation *Corporate* (Falklands Conflict): Air Commander's Report; Report of Proceedings.

⁶² TNA, DEFE 58/278, Memo Senior Air Staff Officer, No.1 Group RAF to AOC No 1 Group RAF, 23 June 1982.

⁶³ See, for example, *Parliamentary Debates* (hereafter 'Hansard'), 29 April 1982, Col. 1021; *Hansard*, 20 May 1982, Col. 497 for Benn's concerns.

⁶⁴ TNA, AIR 20/13048. Operation *Corporate* (Falklands Conflict): Vulcan aircraft operations, including Black Buck operations.

⁶⁵ Craig was a former Vulcan squadron commander and would go on to become Chief of the Air Staff (1985-88) and then Chief of the Defence Staff (1988-91).

⁶⁶ TNA, AIR 20/13048. Operation *Corporate* (Falklands Conflict): Vulcan aircraft operations, including Black Buck operations, Military Appreciation of the Use of Vulcans to carry out Attacks on the Argentine airfields at St Julian, Rio Gallegos and Rio Grande, 24 May 1982.

⁶⁷ *Ibid*.

⁶⁸ *Ibid*.

⁶⁹ *Ibid*, 'Intelligence Input to an Appreciation on the use [of] Vulcans to carry out attacks

on Rio Gallegos and Rio Grande Airfields, 14 May 1982.

⁷⁰ Ibid.

⁷¹ Ibid, Price to VCAS, 'Vulcans against Argentine mainland airfields', 25 May 1982.

⁷² Ward, *Sea Harrier Over the Falklands*, 247-48; Channel 4 'The Falklands Most Daring Raid'.

⁷³ S. Rivas. *Wings of the Malvinas*. (Buenos Aires: Hikoki Publications, 2010), 32.M. Atilo, V. Celleto and J. Mosquera. "Argentina's 'Heavies': Avro Lancaster, Lincoln and Lancastrian in Military Service: Part Two." *Air Enthusiast* (No. 97, January/February 2002), 39.

⁷⁴ TNA, FCO 7/4088. Sale of Defence equipment to Argentina.

⁷⁵ Ibid.

⁷⁶ Ibid

⁷⁷ Ibid.

⁷⁸ <https://www.pprune.org/military-aviation/479504-falklands-most-daring-raid-7.html>, post #139. Although anonymous, the poster suggesting that the raids had a 'heavy moral effect' [sic] was serving in the Argentine forces at Stanley during the Conflict; See also Martin Middlebrook, *The Argentine Fight for the Falklands* (Barnsley: Pen & Sword, 2009), 76-78; 120.

⁷⁹ Price, 'Black Buck to the Falklands'; Philp D Grove, 'The Air War: A New Appraisal', Stephen Badsey, Rob Havers & Mark Grove, *The Falklands Conflict Twenty Years On: Lessons for the Future* (Abingdon: Frank Cass, 2005), 276; Ward, *Sea Harrier over the Falklands*, 206-207.

⁸⁰ TNA DEFE 58/262, 18 Group: Operation Corporate (Falklands Conflict) Lessons Learned, comments by Air Commander.

⁸¹ Institute of Contemporary British History Witness Seminar *The Falklands War* (5 June 2002).

⁸² Rivas, *Wings Of the Malvinas*, 206.

⁸³ Grove, 'New Appraisal', 276.

⁸⁴ TNA, AIR 20/13113, Operation Corporate, Falklands Conflict: bombing raids on Port Stanley airfield.

⁸⁵ Freedman, *Official History, Volume 2*, 421.

‘IN AT THE DEEP END’: RAF HARRIER OPERATIONS DURING OPERATION CORPORATE, 1982¹

By Dr David Jordan and
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Biography: Wing Commander John Shields’ formative years in the RAF focussed on air defence duties in the Tornado F3. More recently, he has held posts on the Advanced Command and Staff Course Directing Staff and as an RAF Division Course Director. He has an MA in Defence Studies from King's College London and is in the latter stages of his CAS Fellowship PhD.

Abstract: The story of the RAF's role in the Falklands Conflict is dominated by Operation Black Buck, the long-range bombing attacks against Port Stanley airport. Yet a small force of Harrier GR3s from Number 1(Fighter) Squadron played a notable part in the fighting which has tended to be obscured by discussion of the Vulcan raids and the work of the Fleet Air Arm's Sea Harrier force. This article considers the work of 1 Squadron and analyses the challenges faced by the Squadron and the effect the Harriers were able to contribute to the retaking of the Falkland Islands.

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INTRODUCTION

When the Argentine invasion of the Falkland Islands began on 2 April 1982, it did so with the Argentine *junta* firmly under the impression that the British response would, and could, be little more than words of outrage before accepting the occupation of what would become known as Las Islas Malvinas as a *fait accompli*. This represented a spectacular failure to understand one's opponent. As the threat of an Argentine invasion became ever more apparent, British planning for a military response began, even before the invasion force had come within range of the Falklands. Central to that response was a maritime task force – Task Force 317, made up of a carrier battle group (TF317.8) and amphibious group (TF317.0) to convey the land forces (TF317.1) which would evict the Argentine troops occupying the islands if diplomatic efforts to secure their unconditional removal failed. In the House of Commons on Saturday 3 April 1982, in an atmosphere which for once merited the epithet 'febrile', Prime Minister Margaret Thatcher informed fellow Members of Parliament that a task force would be despatched. The Task Force was swiftly assembled and began a three-week long journey toward the South Atlantic, headed by the United Kingdom's only two aircraft carriers, HMS *Hermes* and HMS *Invincible*. The task force was about to embark upon the sort of operation which had been specifically rejected as a plausible contingency in the 1966 Defence Review (as a contributory reason for cancelling the projected CVA01 class of aircraft carrier), in which the bulk of the air power required to defend the fleet and launch attack and reconnaissance missions had to be carrier-based. The carriers went without any airborne early-warning capability embarked (hasty efforts to convert several Sea King helicopters for the role began almost immediately, but these did not reach the Task Force before the end of the war). But they did take with them the majority of the nation's Sea Harriers, the only dedicated naval fighter aircraft available.

The performance of the Sea Harrier, colloquially known by the shorthand of 'SHAR', and its pilots during the Falklands campaign was remarkable, but thanks to the considerable publicity the type garnered for its success in air-to-air combat, the work of the aircraft from which the Sea Harrier was derived tended to be overlooked. Harrier GR3s from Number 1 (Fighter) Squadron joined the Task Force, via a deployment to Ascension Island, in early May 1982 and flew 151 missions until the end of the conflict on 14 June.² Following the cessation of hostilities, the GR3s remained in the Falklands providing air defence while the runway at Port Stanley Airport was repaired and extended to allow the eventual deployment of a force of Phantom FGR2 air defence aircraft. Yet when the Falklands conflict began, the prospect of the Harrier GR3 force being involved appeared remote to those who would ultimately find themselves deployed.

Number 1 (Fighter) Squadron, unlike the RAF's other two Harrier squadrons (Numbers 3 and 4) was based at RAF Wittering rather than in RAF Germany and conducted overseas deployments as a matter of routine as part of NATO's Allied Command Europe (ACE)

Mobile Force, the Alliance's rapid reaction force designed to provide reinforcement across the NATO area. Owing to their greater expeditionary footing, 1 Squadron's pilots were also qualified to conduct air-to-air refuelling, which meant that they were the most likely part of the RAF Harrier force to deploy.³ Even so, the distances involved in deploying to the Falklands appeared to preclude the use of the RAF Harrier force. Although 1 Squadron recognised that the Harrier's versatility meant that it might be used in any response, the apparent lack of a suitable operating location meant that such a deployment seemed remote. The Officer Commanding 1 Squadron, Wing Commander Peter Squire, recorded in his diary that the prospect of being held in reserve in Rio de Janeiro was a 'popular choice' in the discussions of squadron members as to their possible role in a response to the invasion.⁴

The Squadron was not to know that some scoping of the possibility of air attack had already been undertaken within the Ministry of Defence (MOD), and that the small size of the Sea Harrier force was a source of considerable concern. The 'SHAR' was vital to the air defence of the Task Force against enemy air attack, but there was little in the way of an effective attrition reserve. The need to preserve the Sea Harrier force was an influence upon the choice of aircraft to strike against Port Stanley Airport, and the risk of attrition to the 'SHAR' prompted thoughts of using the Harrier GR3 in the air defence role, as well as reducing the need for Sea Harriers to conduct offensive operations in support of the land forces which would be used to recapture the islands and evict the invaders.

There was good reason to assume that the Harrier GR3s might be called upon to join the Task Force to alleviate the burden faced by the Sea Harriers. Number 1 Squadron had conducted some trials and demonstration of the potential of the Harrier aboard the helicopter cruiser HMS *Blake* in the summer of 1969 and the aircraft carrier HMS *Ark Royal* in 1971, while a later deployment aboard the carrier *Hermes* had taken place in 1978, involving a Sea Harrier, British Aerospace's Harrier T4 demonstrator, and a Harrier GR3 and Harrier T4 from the RAF.⁵ Even if 1 Squadron thought that their deployment was unlikely, the planners at the MOD had other ideas, and on 8 April, the Squadron was tasked by the Assistant Chief of the Air Staff (Operations) for 'details of operational requirements needed to prepare the squadron for possible involvement in the South Atlantic.' Since its introduction to service in April 1969, the RAF Harrier was specifically designed to operate in the attack and reconnaissance roles, but they were to add another role upon deployment to the South Atlantic as attrition replacements for the anticipated Sea Harrier losses in the air defence role.

As Peter Squire's diary entries make clear, although the GR3s were seen as an attrition reserve for air defence, the idea had clearly not been fully developed as the Squadron felt compelled to press for an urgent programme to clear the GR3 for carriage of the AIM-9 Sidewinder missile.⁶ While the matter was still being considered within RAF Strike Command, Squire urged that even a photograph of a Harrier GR3 carrying a

fake AIM-9 made from cardboard tubing and painted convincingly would provide propaganda benefits.⁷

Despite what appeared to the Squadron to be a rather peculiar reluctance on the part of Strike Command to accept the need to obtain clearance for AIM-9 carriage, Squire's reflections on the efforts to prepare his Squadron for Operation CORPORATE include recognition of the considerable support required from a multitude of agencies to enable the ambitious expedition, including the MOD and its subordinate Procurement Executive, RAF Strike Command, RAF Germany and industry. Even so, there were frustrations, such as the initial ambiguous command and control construct which hindered progress, with the Squadron 'reacting to inputs from four sources, Ministry of Defence, Strike Command, 18 Group and the Navy, with 38 Group kept very much in the dark.'⁸ Squire complained that there had been 'several instances of "left hand and right hand".... such incidents have been most frustrating.'⁹ Nevertheless, the efforts to turn an expeditionary land-based attack squadron into an embarked air defence capability in a tight timeframe were impressive. Aircraft were rapidly modified to ensure that they could operate from an aircraft carrier. Modifications included, 'the fitting of shackles to the outriggers for lashing down purposes, a modification to allow active nosewheel steering and an engineering design to provide a means of aligning the aircraft's INAS (Inertial Navigation and Attack System) on a moving deck.'¹⁰ Additional modifications involved the fitment of, 'an I-Band transponder for bad weather recoveries, hardened limiters for the engine control system and an anti-corrosion treatment.'¹¹

In addition to the modifications to make the Harriers carrier-compatible, some work had to be conducted to provide the aircraft with one of the key weapons in its arsenal, namely the air-to-ground rocket projectile.

During routine operations, the Harrier GR3 force normally operated with the 68mm SNEB (*Societe Nouvelle des Etablissements Edgar Brandt*) rocket pod capability. The SNEB rockets were particularly effective against soft targets such as vehicles and enemy bunkers, and had been the primary weapon for use against tanks prior to the introduction of the BL755 Cluster Bomb. It was realised that the high energy electromagnetic emissions on board ship presented a problem for weapons safety, since the SNEB rocket had never been cleared for carrier-based operations.¹² A risk of electromagnetic interference causing an unintentional firing of rockets could not be accepted, so the RAF Harriers had to be rapidly cleared for carriage of the Royal Navy's 2-inch rocket pod.¹³ As a result, a hasty clearance to carry and fire the alternative capability was received on 26 April. Pre-deployment training was limited to one Harrier GR3 pilot deploying to Royal Naval Air Station Yeovilton to carry out a brief trial sortie only a few days prior to the Squadron's dispatch to the South Atlantic.¹⁴ However, the Royal Navy 2-Inch rockets were deemed to perform in a very similar manner to the SNEB rockets albeit with a wider, 'shotgun-like' distribution following launch.¹⁵ Despite the lack of

familiarity with the new weapons system, the Harrier GR3 force was compelled to use the Royal Navy 2-Inch rockets due to a shortage of cluster bombs.¹⁶ Although the Royal Navy 2-Inch rockets gave the Harrier GR3 force a degree of stand-off from the target, the weapon had a smaller footprint than the BL755 cluster bomb and suffered from a significant number of misfires.¹⁷ Nevertheless, as the sole user of the weapon during the Conflict, the Harrier GR3 force would go on to employ 52 pods of Royal Navy 2-Inch rockets.¹⁸

Flying training encompassed ski-jump take-off training at Royal Naval Air Station Yeovilton between 14 and 23 April. Dissimilar Air Combat Training (DACT) was conducted against the RAF's Lightning fighter force and Hawker Hunters normally used for training by Tactical Weapons Units, boosted by the co-operation of the French government, which willingly allowed *Armée de l'Air* Mirage IIIs and *Aéronavale* Super Etendards to give Harrier and Sea Harrier pilots DACT opportunities for an insight into the capabilities of the Argentine aircraft they would face in the coming weeks over the South Atlantic. Moreover, an end-to-end test of the GR3's new air-to-air capability proved to be a success when five of the six AIM-9G Sidewinders were employed effectively at the Aberporth weapons range, off the west coast of Wales, on 30 April.¹⁹ However, the control of the air role was not the sole focus of the Squadron's work-up. Ultra-Low Level (ULL) flying down to 100 feet was conducted. Moreover, 28 cluster bomb units were also dropped against a splash target. Further expansion of the Harrier GR3 capability was also reviewed. The understanding that the Argentine radars around Port Stanley Airport represented a threat to Task Force aircraft saw options to introduce an anti-radiation missile considered. The possible value of using precision-guided munitions against high-value targets and possibly against enemy troop positions saw the beginning of the development of a precision attack capability. Additionally, measures to provide the aircraft with a self-protection capability against enemy air and ground threats were also progressed. The latter capabilities came online as Operation CORPORATE progressed but were but not available in time to support the initial GR3 deployment.

On 19 April, the Squadron received its initial deployment order. They were tasked with deploying nine aircraft; six aircraft would join the Task Force with the three remaining Harriers to be retained at Ascension Island for air defence duties. Over the period 2-6 May 1982, the nine aircraft deployed from their home base at RAF Wittering to Ascension Island utilising a combination of air-to-air refuelling and refuelling stops at RAF St Mawgan in Cornwall and Banjul in Gambia. Planning assumptions suggested that after 21 days of operations the Sea Harrier force could be as low as 14 aircraft. This assumption was based upon the premise that only the aircraft (and possibly the pilot) would need to be replaced, rather than the total capability. This meant that 1 (Fighter) Squadron deployed with a skeleton engineering staff of only eighteen personnel. Although 38 engineers had been initially prepared for the deployment, even this figure was well short of the manning levels required to support the aircraft

during normal operations – the post-conflict force of ten Harrier GR3s based in the Falkland Islands would require 200 support staff to guarantee maximum availability. Nevertheless, due to a command edict to limit sleeping quarters to above the water line, living space was at a premium on board HMS Hermes throughout the conflict. Not only did this constrain the numbers of RAF personnel who could be embarked, but the RAF personnel were also forced to 'sleep in hammocks and camp beds erected in passageways where some routine movement continued throughout the quiet hours.'²⁰ The net result was to be additional pressure on the taut Sea Harrier engineering staff to support a similar, but different, aircraft type which was dedicated to fulfilling what was a secondary role for the 'SHAR'.

On 1 May, 1 Squadron's Harrier GR3s were still located at their home base of RAF Wittering. However, their groundcrew would deploy that day to Ascension Island via RAF Brize Norton with the Harriers starting their deployment to Ascension Island the following day. Following the arrival of MV Atlantic Conveyor at Ascension Island on 5 May, the Harriers were flown onto the converted ship on 6 May in calm conditions. Nevertheless, Wing Commander Squire noted that, 'most pilots approached their first VL (vertical landing) onto a deck with some apprehension.' The GR3s were not the sole occupants of the MV Atlantic Conveyor; they would be joined on the journey south by the eight Sea Harriers of the newly-commissioned 809 Naval Air Squadron, as well as



1 Squadron pilots on the deck of MV Atlantic Conveyor during the voyage to the South Atlantic. Air Chief Marshal (then Wing Commander) Peter Squire is pictured standing second from the right. To the left of him are: Squadron Leader Pete Harris, Flight Lieutenants Jeff Glover, Mark Hart, John Rochfort and Tony Harper. To the right of him is Squadron Leader Bob Iveson. Sitting in front is Squadron Leader Jerry Pook.



The Officer Commanding 1 Squadron, Air Chief Marshal (then Wing Commander) Peter Squire, takes off from MV Atlantic Conveyor on 18 May 1982 to head for HMS Hermes.

four Chinook and six Wessex helicopters. After a 12-day transit, four of the six Harriers were flown from MV Atlantic Conveyor to HMS *Hermes* on 18 May, a mere three days prior to the British landings on the Falklands in San Carlos Bay (under the codename Operation SUTTON), with pilots who were unfamiliar with aircraft carrier operations. The remaining GR3s joined their compatriots over the following two days. Although the GR3s had been unable to participate in the first phase of the air campaign (defending the Task Force and shaping operations), they were to make up for this immediately.

On 21 May 1982, British forces landed at San Carlos Bay. This marked the start of an intense period of activity for 1 Squadron. On the very first day, Squire's aircraft had a fault with the undercarriage, and his wingman, Flight Lieutenant Jeff Glover, continued their scheduled mission alone. In his memoir of the campaign, Squadron Leader Jerry Pook (commander of 1 Squadron's 'A' Flight) records that he was astounded that the relatively inexperienced Glover had continued as 'a singleton', and Squire later noted ruefully that the decision not to abort the mission completely was a 'mistake'.²¹ Pressing on, Glover was tasked by HMS *Antrim* with an armed reconnaissance in the vicinity of Port Howard. His first pass over the area showed no sign of enemy activity, and, in agreement with *Antrim*, he made a second run from a different direction. Unfortunately for Glover, there were Argentine forces in the area, and they engaged him. His Harrier was hit by a Blowpipe surface to air missile (SAM) and he was forced to eject at low level and high



Harrier GR3 aircraft of 1 Squadron parked alongside Royal Navy Sea Harriers and a Sea King helicopter on the flight deck of HMS Hermes on 19 May 1982.

speed from an aircraft which was rolling uncontrollably. He survived, but with serious shoulder injuries.²² This overshadowed the other sorties conducted that day, which had seen Pook and his wingman Mark Hare attack an Argentine helicopter landing zone (LZ). Hare's cluster bombs refused to release from the aircraft because of an electrical fault,

while Pook's first attack run had seen his weapons land just beyond the Chinook he had targeted. The Harriers then conducted several strafing passes, with Hare destroying the Chinook while he and Pook each hit at least one of two Puma helicopters sitting on the LZ. The final helicopter, a Bell UH-1 'Huey', was difficult to see, and it took several passes to destroy it, during the course of which Hare's aircraft was damaged by ground fire. Pook was not impressed to receive a lecture from Captain Lin Middleton, the Captain of HMS *Hermes*, about the folly of making multiple passes, or the input from Admiral Woodward, who informed him that he had 'learned a cheap lesson', a comment Pook thought inappropriate given the Admiral's lack of knowledge about air operations.²³ This highlighted a significant problem for the Harrier, namely getting weapons onto targets that were difficult to see, even for aircrew familiar with the art of ground attack.

Unlike the multi-role Sea Harrier, the Harrier GR3 was a dedicated ground-attack and reconnaissance platform. As part of its routine Cold War tasking, the GR3 was employed, 'in the classic offensive air support role providing close air support, battlefield air interdiction and tactical air reconnaissance for the relevant army units.'²⁴ Consequently, had the Third World War begun on the Central Front in Europe, the Harrier GR3s would have attacked 'second echelon Warsaw Pact armoured formations and mobile first echelon equipment where a rapid response for close air support was needed.'²⁵ This was a far more daunting proposition than the previous sentence might suggest. In order to improve the aircraft's capability, the Harrier GR1 had been upgraded to the GR3 variant, firstly through the provision of a more powerful engine, followed soon afterwards by the introduction of a laser ranging marked target seeker (LRMTS) that provided accurate ranging between the aircraft and its target.²⁶ Nevertheless, without radar or other means of on-board target acquisition, Harrier GR3 pilots were still reliant on locating and identifying those targets visually unless aided by a forward air controller using a laser marker to provide a cue for the LRMTS. Visual identification was a significant challenge for a single-seat aircraft operating in a benign environment, never mind one where heavy ground fire was being directed at the aircraft. During the Falklands Conflict, the challenge was even greater as the pilots were operating in contested airspace, at low level, in poor weather and high speed against concealed and camouflaged targets. As a result, pilots were frequently unable to detect the target on their first pass. The lack of on board sensors also meant that the Harrier GR3 had no night or all-weather attack capability. This drove the frequent need for multiple attack passes against ground targets, and the apparent inability of Captain Middleton to understand this irritated the RAF pilots considerably.²⁷ As will be explored below, though, as the war went on the question of whether Middleton might have had a point, and whether this 'press-on-to-achieve-results' approach was appropriate in all circumstances, gained increasing currency.

Over the next few days, the GR3s conducted a series of routine operations, including standing deck alert to provide Close Air Support, armed reconnaissance and attacks

against the airfield at Pebble Island (although many of the aircraft at that location had already been destroyed or badly damaged by a raid carried out by Special Air Service troops on the night of 14-15 May 1982) and an airstrip at Chatres. In the former mission, the Harrier bearing the identification number 14 had its third weapons hang-up as a result of another electrical fault, forcing the pilot to use the emergency jettison procedure to get his bombs (and his underwing fuel tanks) released – they missed the target.²⁸ The unreliability of one of the small GR3 force, without the engineering support which would normally have been available to rectify this annoying fault, was highlighted by this frustrating problem. This was then followed by attacks against Argentine forces at Port Stanley as part of the wider campaign to impede operations at that location. Pook noted with some disdain that a request to fly a pre-strike reconnaissance sortie to improve planning for the attack was grudgingly accepted before the decision was reversed by Captain Middleton.²⁹ Although Pook's book was written with some hindsight (the draft manuscript was completed years before the book was published), Sir Peter Squire's contemporaneous diary also hints that there was a growing realisation that the level of cooperation between the RAF Harriers and the staff aboard *Hermes* was far from smooth, in no small part thanks to interventions from the captain, who was himself a former Fleet Air Arm pilot with decided views both upon how the aircraft on his ship would operate and the presence of an RAF contingent aboard. This frustration extended to an initial belief that the GR3 attacks against Stanley airport should be conducted from low level using retarded bombs, whereas the pilots thought that loft (or 'toss') attacks would be better, albeit the more sophisticated avionics aboard the Sea Harrier meant that accuracy would be greatly improved if a joint effort were mounted, with the Sea Harrier navigating to the target and releasing its more-accurately aimed bombs as a cue for the GR3s to follow suit.³⁰ There was little surprise at the lack of success with retarded bombs, the 1 Squadron diary recording that this was 'as expected'.³¹

On 27-28 May 1982, the Harriers made perhaps their most spectacular contribution to the war in support of the assault by 2nd Battalion, the Parachute Regiment (2 PARA) to capture the settlements of Goose Green and Darwin. 2 PARA was significantly outnumbered by the Argentine defenders, and the battle proved extremely difficult. 1 Squadron provided close air support on 27 May, losing Squadron Leader Bob Iveson's aircraft to ground fire after he sought to reattack a target.

2 PARA's advance became stuck on the morning of 28 May, and the Commanding Officer of 2 PARA, Lieutenant-Colonel Herbert 'H' Jones decided that it was necessary for his command group to make a physical intervention in the battle. Charging up a gully towards Argentine positions, three men were killed almost at the outset, and Jones was mortally wounded as he attempted to clear an enemy trench. The battalion second-in-command, Major Chris Keeble, took over, and, over the course of the next few hours, 2 PARA gained the upper hand after hard fighting. The Argentine defenders had been supported by a 35mm anti-aircraft gun battery, which remained a formidable obstacle to

the attacking troops, so three GR3s were tasked to attack it. Inclement weather initially precluded an attack on the gun, but a break in the clouds allowed Captain Kevin Arnold, a Forward Air Controller from 148 Battery, Royal Artillery, to direct the aircraft to the gun, which they proceeded to attack with cluster bombs. This had a salutary effect on the defenders, as a number of key figures noted after the war.

Years after the event, at an RAF Historical Society seminar, Major General Julian Thompson, commander of 3 Commando Brigade during the conflict, responded to a presentation by Peter Squire (by then Chief of the Air Staff (CAS)):

In his presentation, [Sir Peter] said that his squadron helped to turn the tide at Goose Green. I can tell him that it did turn the tide. 2 PARA were stuck on a forward slope, in daylight, being engaged by 35mm AAA [Anti-Aircraft Artillery] at 2,000 metres range, something to which they had absolutely no answer. Suddenly, like cavalry to the rescue out of the sky, came three Harriers which promptly took out those guns and turned the tide of the battle. There is a tale behind that too. We had previously been supported by CAS's squadron on exercise in Norway and we had a very high opinion of what they could do. While we were on our way south, I turned to my primary FAC, who was an RAF Phantom back-seater on a ground tour, and told him that I needed No 1 Sqn. He said that I would never get them. I asked why and he replied that they simply couldn't get there. Thank God you did Peter, because you really did pull the fat out of the fire for us...³²

Major Tony Rice, a Royal Artillery officer attached to 2 PARA, saw the attack from relatively close quarters, and later recalled:

The cluster bombs...were the most devastating thing I had ever seen. The ground boiled [sic] and there was a thunderous roar, then total silence covered the battlefield. The stuffing was completely knocked out of the Argentines...³³

The psychological effect of the attack also impressed the acting CO of 2 PARA, Chris Keeble, who observed that

The devastating violence created by the Harriers who attacked the outskirts of the settlement at last light clinched it. It was at that moment it seemed to me that the will of the defence began to break...³⁴

More pithily, one of 2 PARA's officers remarked 'they frightened *me* ****less, never mind the Argentines'.³⁵

Keeble exploited this effect in his negotiations with the Argentine garrison, promising that there would be more air attacks in addition to the obviously ferocious and determined

efforts of his men. The Argentines concluded that enough was enough, and surrendered, giving the British their first major land victory of the war.

The Battle of Goose Green demonstrated the efficacy of the Harrier GR3 in support of ground troops, but the first week of operations had seen the loss of aircraft and damage inflicted upon others. Unlike the Sea Harrier force, more Harrier GR3s could be sent to the South Atlantic from the much larger RAF inventory to sustain this demonstrably valuable attack capability. On 1 June, two replacement Harrier GR3s flew an eight-and-a-half-hour mission from Ascension Island to HMS *Hermes*, supported by Victor air-to-air refuelling aircraft. A similar mission was also flown a week later. Remarkably, and despite the success at Goose Green and the value of dedicated attack aircraft, Captain Middleton believed that the plan, codenamed Operation BOWSPRIT, was nothing more than a publicity stunt by the RAF.³⁶ Despite Middleton's reservations regarding the risk associated with the long over-sea transit, the missions went ahead. So what benefit did the 'RAF publicity stunt' bring to the British campaign?

The four new aircraft not only allowed the Harrier GR3 output to be increased but also introduced a number of new capabilities to the campaign including: the use of laser-guided bombs, following the successful completion of Trial *Puritan*; an ALE-40 chaff and flare dispenser; and an improvised self-protection radar jammer.³⁷ Also, as part of Trial *Athene*, one aircraft was modified to use the Shrike anti-radiation missile, the same weapon that had been used by RAF Vulcan bombers operating out of Ascension Island on possibly the longest-range Suppression of Enemy Air Defence sorties in history.³⁸ The modified aircraft arrived on board HMS *Hermes* on 8 June.³⁹ The introduction of the Harrier's Shrike capability was hampered by a lack of missiles, as the original weapons were not offloaded from an RAF VC10 aircraft at Ascension Island as intended as the result of an oversight. The weapons remained aboard the VC10 and were 'subsequently found by the Uruguayan authorities and impounded' following inspection of the aircraft which had subsequently been tasked with aeromedical duties.⁴⁰ Nevertheless, eight missiles, four launchers and associated equipment were parachuted to the Task Force on 10 June by a Hercules on a 25-hour re-supply mission from Ascension Island.⁴¹ As a result, the Harrier force was an AGM-45A Shrike-capable platform from 13 June, although the Argentine surrender the next day meant that the weapons were never used. The Harrier GR3, through reinforcements and a series of upgrades, was able to deliver a sustainable and enhanced attack capability throughout the remainder of the campaign.

These enhancements were completed with the introduction of a precision capability, and might have been even greater had 1 Squadron not experienced considerable frustration with the effort to make use of precision-guided munitions (PGMs). The possibility of conducting more precise attacks on Argentine positions had excited some interest, even though the 1,000lb Paveway laser-guided bomb was not an extant part of the Harrier GR3's inventory. The weapon was rapidly introduced as an urgent

operational requirement. Paveway modification kits were air-dropped by Hercules flying from Ascension Island to the Task Force on 24 May 1982, and the weapons were being employed against Argentine targets six days later.⁴² However, the lack of understanding and experience of the new weapon would soon become evident. For example, confusion regarding how to effectively deliver the required laser reflection from the designated target led to the initial weapons missing their target.⁴³ Nevertheless, once procedures had been refined by both air and ground parties, the weapon was delivering the required effect on a more consistent basis during the latter stages of the land campaign.

1 Squadron dropped eleven laser-guided bombs during the conflict, of which four were guided successfully.⁴⁴ The sighting of white flags over Port Stanley led to the cancellation of another PGM attack on 14 June 1982. The Harriers returned to *Hermes*, their part in the war complete.



1 Squadron Harrier GR3 taking off from the airfield at Port Stanley, destroyed Argentinian Air Force Pucara aircraft in the background.

The end of the war coincided with the arrival in theatre of MV *Contender Bezant* with a consignment of a further four Harrier GR3s.⁴⁵ In parallel, 3 Squadron was identified as the follow-on replacement for 1 Squadron and, after some uncertainty, eventually commenced their deployment to the South Atlantic in the immediate post-conflict phase on 30 June with eight pilots and 36 engineers.⁴⁶

ASSESSMENT

History has not been entirely kind to the RAF's Harrier operations in 1982, since the efforts of the Sea Harrier force, present from the start of the fighting until its conclusion, have overshadowed the work of the small 1 Squadron element aboard HMS *Hermes*. Yet the Harrier GR3s added to the overall capability of the Task Force, even if there were some significant problems in the way in which they were employed. Much of this lay in long-standing inter-Service rivalry, which appears to have had a regrettable influence.

The Harrier GR3 pilots were exasperated that their attack and reconnaissance capabilities were neither understood nor exploited, and that their advice apparently went mostly

unheeded.⁴⁷ In addition to the lack of understanding across the embarked joint air wing, there were also issues regarding the command and control of the embarked Harriers. The designated Air Commander for Operation CORPORATE was Air Vice-Marshal Sir John Curtiss, Air Officer Commanding 18 Group. He remained in the United Kingdom for the majority of the campaign, although he did once venture as far south as Ascension Island. In the context of the operation, with 18 Group's vital commitment to maritime operations closer to home, this is understandable. However, this had the deleterious effect for 1 Squadron that the operational command of the Harrier GR3s was delegated to Woodward as Carrier Task Group commander with operational control allocated to the Captain of HMS *Hermes*.⁴⁸ Woodward, a submariner, took the entirely reasonable decision that, as Middleton was an aviator, he was best placed to use the air assets. For all Middleton's undoubted success as a naval officer – as tributes from former subordinates after his death in 2013 demonstrated – his handling of the air effort in Operation CORPORATE was less sure-footed. In his post-conflict report, Peter Squire observed that, 'in [HMS] *Hermes*, the Captain himself exercised a very tight control on flying operations and the Squadrons' programme was totally dictated by the ship.'⁴⁹ The RAF Liaison Officer to Lieutenant General Jeremy Moore (the commander of the UK's land forces in the Falklands), also commented in his post-conflict analysis that tasking of sorties 'differed from the RAF/NATO system by depending more on the intuitive wishes of the Admiral and the Captain.'⁵⁰ Due to Middleton's command style, once a decision was made it was difficult to change it. Pook highlights the implications of such intransigence by suggesting that, 'several times we found ourselves attacking targets with unsuitable weapons which were wrongly fused', a result of direction from Middleton.⁵¹ Such complaints were not just limited to the junior Service: much to Lieutenant Commander 'Sharkey' Ward's vexation, the Sea Harrier pilots of 801 Naval Air Squadron also found themselves affected by Middleton's robust, tactically-focused leadership style, even though they were aboard HMS *Invincible*, under the command of Captain JJ Black.⁵²

Considering how this difficulty might be rectified in future, the Central Tactics and Trials Organisation's report into the conflict suggested that 'specialist advisors with adequate authority should be deployed with RAF assets, if operational control is to be exercised by another Service, to ensure effective operational employment.'⁵³

In addition to problems with tasking, the RAF Harriers faced other challenges. Operating in the low-level, high-speed environment without sensors, the Harrier GR3s found it difficult to detect and strike their often-concealed targets on their first pass. Forced to reattack the target – sometimes on multiple occasions – to be able to employ their weapons the Harrier GR3s were increasingly exposed to enemy ground fire. Bob Iveson and Jeff Glover both fell prey to ground fire making more than a single pass, although both survived the ordeal. The Harrier GR3 re-attack tactic became controversial both within the Squadron and beyond. Pook was criticised by his wingman on 26 May following multiple passes

over the same target in the Mount Kent area.⁵⁴ Commodore Mike Clapp, Commander of the Amphibious Task Force, himself an experienced naval aviator, suggested that, ‘second passes over enemy positions were inviting disaster.’⁵⁵ In keeping with his robust account of the Conflict, Pook dissents with this perspective, arguing that risks had to be taken to obtain results.⁵⁶ The culture evident amongst the Harrier community was that achieving the task was important, but the risks that this entailed were problematic; reaching a consensus on the ‘correct’ approach is almost impossible – particularly from the comfort of an office chair 36 years after the war – but the evidence suggests that both arguments for and against multiple passes had merit, with context being key. Operating in the low-level and high-threat environment was a high-risk proposition. As a result, the British tolerated the risks and accepted that losses were inevitable, a high-risk strategy which was pursued throughout the campaign.

A more prudent method might have been to use British combat air assets in a coordinated, pre-emptive way that exploited air power’s strengths and allowed the land battle to be shaped to the advantage of the British. Noting that the vast majority of land battles were being fought at night, the Harrier GR3 was at an added disadvantage, as it had no night attack capability.⁵⁷ In order to maximise its utility, therefore, the Harrier GR3 needed pre-emptive reconnaissance and sufficient time during daylight to prosecute Argentine fielded forces. This was rarely done thanks to the sub-optimal tasking of the aircraft. As a result, the utility of British attack missions was reduced. Furthermore, ascertaining what had been achieved was also problematic thanks to the lack of battle damage assessment conducted. The point was reiterated to the then Chief of the Air Staff by Harrier GR3 pilots who flew during the conflict when they observed that ‘weapon effects were difficult to judge.’⁵⁸ With limited timely feedback from British ground forces and a lack of on-board sensors to record the effects of their attacks, the Harriers were unable to assure themselves that their attacks had achieved their mission aims. Demonstrating that the adage ‘time spent on reconnaissance is seldom wasted’, the lack of pre-emptive and post-strike reconnaissance meant that finite resources were used in an inefficient, repetitive and high-risk manner.

The relatively limited exploitation of the Harrier GR3’s capabilities during the conflict (compared to what it might have achieved) is reflected in the Number 38 Group post-conflict report, which evaluated all the difficulties faced by the small Harrier contingent before glumly concluding, ‘it is remarkable that No [Number] 1 Squadron achieved any success at all.’⁵⁹

Yet this is too pessimistic. The Harriers made a significant outcome to the successful conclusion of the Battle of Goose Green, contributed to the harassment of Argentine forces around Port Stanley Airport, and, as Sir Peter Squire later reflected, demonstrated – when tasked – the importance of tactical reconnaissance. Once the problems with

designating Laser-Guided Bombs (LGBs) were understood, four bombs were delivered with considerable effect, presaging the RAF's slow move towards the adoption of a full precision attack capability. It is regrettable that the effectiveness of LGBs was not fully appreciated in all quarters after the war, and it may be that the initial failures to guide the weapons contributed to this. They also, albeit as a result of negative experience, demonstrated the importance of having sufficient engineering staff to support a deployment, since despite the Herculean efforts of the maintainers aboard HMS *Hermes*, the presence of a much expanded fixed-wing force carrying out operations with which the carrier's crew were not fully familiar created problems that might otherwise have been avoided. The importance of coordinating air operations was demonstrated on numerous occasions, and the move towards ensuring that proper joint planning under a dedicated joint air component commander was hastened as a result. Speculation as to what might have been achieved with an air component commander and staff embedded in the Task Force must remain just that, but it seems probable that the outcome would have been greater success in the way in which air power was used. Perhaps the greatest significance of 1 Squadron's work lay in demonstrating once again the potential effects of properly-integrated air, sea and land power and the flexibility and adaptability that air power offers.

EPILOGUE

The editorial board of *RAF Air Power Review* had hoped that Air Chief Marshal Sir Peter Squire would offer his thoughts on his Squadron's contribution to the Falklands campaign, rather than publish the above article. Sadly, Sir Peter died on 19 February 2018 before he was able to make his contribution. Had he done so, though, it is entirely probable that he would have modestly omitted to mention that he was awarded the Distinguished Flying Cross for his efforts in 1982, or that he narrowly avoided being wounded by ground fire when an Argentine round entered his cockpit, or to have referred to a bone-jarring crash at a forward landing strip when his aircraft's engine failed at a critical moment; nor would he have staked out his place in history as the first man to deliver a laser-guided bomb in combat from an RAF aircraft. The authors respectfully dedicate this piece to his memory.

NOTES

¹ The title is derived from Chapter 1 of Sqn Ldr Jerry Pook, *RAF Harrier Ground Attack Falklands* (Barnsley: Pen & Sword, 2007).

² The National Archives [Hereafter TNA], DEFE 67/124 'Operation Corporate: Harrier Aircraft Operations', 5.

³ Air Chief Marshal Sir Peter Squire, 'Harrier Operations', *RAF Historical Society Journal - Seminar: The Falklands Campaign (Volume 30 [2003])*, 102. [Hereafter 'RAFHS Journal - Falklands'].

⁴ Sir Peter Squire, 'The Number 1 (Fighter) Squadron Operation Corporate Diary 1982', entry for 2 April. Previously hosted at <http://www.raf.mod.uk/history/HarrierDiary1.cfm>

(link obsolete after RAF website upgrade 2018; accessed 20 December 2017) Hereafter 'Squire Diary'.

⁵ See Imperial War Museum [IWM], 'Harrier Trials on HMS *Blake*', 1969-08, Catalogue number ADM1908; IWM, 'Harrier Trials on HMS *Ark Royal*', 1971-05, Catalogue number ADM 4460 and IWM, 'Harrier Trials on HMS *Hermes*', 1978, Catalogue Number ADM4797.

⁶ Ibid, diary entries for 8,16 and 17 April 1982.

⁷ Ibid, diary entry for 17 April 1982.

⁸ TNA, AIR 27/3525; No 1 (Fighter) Squadron (Falklands Conflict), 'Summary of Events April 1982, CO's Comments.

⁹ Ibid.

¹⁰ Bob Marston, *Harrier Boys: Volume One – Cold War Through the Falklands, 1969-1990* (London: Grub Street, 2015), 83.

¹¹ Ibid

¹² R.A. Burden et al. *Falklands – The Air War*. (London: Arms and Armour Press, 1986), 372.

¹³ Pook, Harrier Ground Attack, 7.

¹⁴ Squire. "Harrier goes to War." <http://www.raf.mod.uk/history/TheHarrierGoestoWar.cfm> (accessed 8 January 2016).

¹⁵ Pook, Harrier Ground Attack, 7.

¹⁶ Ibid., 148.

¹⁷ TNA, DEFE 58/282. Operation *Corporate* (Falklands Conflict): Air Commander's Report; Report of Proceedings, October 1982.

¹⁸ TNA, AIR 27/3525. No 1 (Fighter) Squadron (Falklands Conflict), Summary of Events, June 1982.

¹⁹ Ibid; Summary of Events, April 1982, CO's Comments.

²⁰ Marston, *Harrier Boys*, 89.

²¹ Jerry Pook., *RAF Harrier Ground Attack – Falklands*. (Barnsley: Pen and Sword, 2007), 61; Squire Diary, 21 May 1982.

²² Ibid, 171. Jeff Glover recovered from his injuries and later flew a tour with the RAF Aerobatic Team.

²³ Ibid, 59-61.

²⁴ Group Captain Jock Heron, 'The Cold War Concepts of Operation for the RAF Harrier Force', *RAF Historical Society. "Journal 35A – The RAF Harrier Story*. [Hereafter *RAF Historical Society – Harrier*], 55 <http://www.rafmuseum.org.uk/documents/Research/RAF-Historical-Society-Journals/Journal-35A-Seminar-the-RAF-Harrier-Story.pdf> (accessed 17 January 2016).

²⁵ Ibid,58.

²⁶ Many accounts of the Harrier assume that the addition of the LMRTS brought about the change of designation from GR1 to GR3, but it was in fact the installation of the Rolls Royce Pegasus Mk 103 which led to a new designation for the aircraft.

²⁷ Pook, *Harrier Ground Attack*, 60-61.

²⁸ Ibid, 75-78. The offending aircraft had been flown by Mark Hare during the attack on

the helicopter LZ, and then by Sqn Ldr Pete Harris against Goose Green the following day, where the same electrical fault precluded weapons release.

²⁹ Pook, *Harrier Ground Attack*, 78.

³⁰ *Ibid*, 83, 85.

³¹ TNA, AIR 27/3535, No. 1 (Fighter) Squadron, Summary of Events May 1982, 6.

³² *RAFHS Journal – Falklands*, 115.

³³ John Wilsey, *H Jones, VC: The Life and Death of an Unusual Hero* (London: Hutchinson, 2002), 284-285.

³⁴ Max Arthur, *Above All, Courage: First Hand Accounts from the Falklands Front Line* (London: Sphere Books, 1985), 192.

³⁵ Spencer Fitz-Gibbon, *Not Mentioned in Despatches... The History and Mythology of the Battle of Goose Green* (Cambridge: Lutterworth Press, 1995), 174.

³⁶ Marston, *Harrier Boys*, 95.

³⁷ TNA, AIR 24/3299, HQ Strike Command (Falklands Conflict); Marston, *Harrier Boys*, 97. The jammer, known as 'Blue Eric', was housed within one of the two Harrier under-fuselage gun pods. Jeff Ethell and Alfred Price, *Air War South Atlantic*, (London: Sidgwick and Jackson, 1983), 154.

³⁸ TNA, AIR 24/3299, HQ Strike Command (Falklands Conflict); TNA, AIR 27/3525. No 1 (Fighter) Squadron (Falklands Conflict); Black Buck 5 and 6 were the two Shrike-armed Vulcan missions conducted on 31 May and 3 June respectively; Burden et al, *Falklands Air War*, 365-7.

³⁹ TNA, AIR 27/3525, No 1 (Fighter) Squadron (Falklands Conflict), Summary of Events, June 1982, 2.

⁴⁰ TNA, AIR 24/3299, Headquarters Strike Command Operations Record, June 1982.

⁴¹ *Ibid*; Burden et al, *Falklands Air War*, 408.

⁴² Squire, "Harrier goes to War." <http://www.raf.mod.uk/history/TheHarrierGoestoWar.cfm> (accessed 8 January 2016); TNA, AIR 27/3525, No 1 (Fighter) Squadron (Falklands Conflict), 8.

⁴³ Pook, *Harrier Ground Attack*, 196.

⁴⁴ TNA, AIR 27/3525, No 1 (Fighter) Squadron (Falklands Conflict), Summary of Events, June 1982, 4.

⁴⁵ Burden et al, *Falklands Air War*, 382-5.

⁴⁶ See TNA, AIR 27/3527. No 3 (Fighter) Squadron Operations Record Book, January 1981-December 1982.

⁴⁷ TNA, AIR 27/3525, No 1 (Fighter) Squadron (Falklands Conflict), Summary of Events, June 1982, 3; also see Pook, *Harrier Ground Attack*, 179-180.

⁴⁸ TNA, AIR 24/3299, Headquarters Strike Command Operations Record, June 1982.

⁴⁹ TNA, AIR 20/13126, Operation *Corporate* (Falklands Conflict): reports and articles; Harrier aircraft operations.

⁵⁰ *Ibid*.

⁵¹ Pook, *Harrier Ground Attack*, 81.

⁵² Ward, *Sea Harrier over the Falklands*, 250.

⁵³ Air Historical Branch, CTTO/26/2/Ops. CTTO Report on Tactical Lessons Learned from Operation *Corporate*.

⁵⁴ Pook, *Harrier Ground Attack*, 105.

⁵⁵ Mike Clapp and Ewan Southby-Tailyour. *Amphibious Assault Falklands*. (London: Leo Cooper, 1996), 143.

⁵⁶ Pook, *Harrier Ground Attack*, 105.

⁵⁷ TNA, AIR 24/3299, Headquarters Strike Command Operations Record, June 1982.

⁵⁸ TNA, AIR 20/13191, Operation *Corporate* (Falklands Conflict): report and debriefs.

⁵⁹ TNA, AIR 20/13126, Operation *Corporate* (Falklands Conflict): reports and articles; Harrier aircraft operations.

NO ORDINARY JOB: A PERSONAL PERSPECTIVE

By Air Commodore Paddy Teakle (Retired)

Biography: Air Commodore Paddy Teakle (Retired) joined the RAF as a navigator in November 1978. He has flown the Vulcan, Victor and Tornado aircraft and has accumulated over 3,600 hours including 42 combat missions. An Air Command and Control expert, his experience stretches from the Falklands campaign through Iraq, Kosovo, Afghanistan, Libya and Syria. He retired in November 2017.



Air Commodore (then Wing Commander) Paddy Teakle and his pilot during Operation TELIC, 2003.

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INTRODUCTION

In its centenary year, the Royal Air Force has adopted the recruiting slogan ‘No Ordinary Job’. Having had the privilege to have served for well over one-third of those one hundred years, I can certainly attest to its accuracy.

“I’m not as green as I’m cabbage looking!”

The date was 19 April 1982. It is not a particularly memorable date for the Royal Air Force, but for me personally it was special and remains so to this day. I remember sitting at home on leave having just completed my Operational Conversion onto the Victor K2 air-to-air refuelling aircraft. Suddenly the phone rang. It was the operations assistant from my new Squadron (Number 57 Squadron): ‘Sorry to trouble you on leave, Sir, but do you think you could come in to fly this evening, there is a bit of a flap on.’ So I jumped onto my bicycle and rode the 3 miles to work – yes, I was already a qualified Victor navigator, but I was still some way off from holding a driving licence! I arrived at the Squadron and met up with the rest of the crew for mission planning. The captain solemnly announced that: ‘Tonight is Paddy’s squadron acceptance flight and we will be refuelling a Vulcan on the tanker towline just east of the Wash.’ Mmmm, I thought; this is obviously a wind-up for the new boy, as even a tyro such as myself knew that it had been over a decade since the Vulcan had been fitted with a refuelling probe. However, I fully understood that it was not the new boy’s position to question the aircraft captain’s authority (these were pre-CRM days, after all), so I played along with what I thought was a jolly jape at my expense. After all, I was not as green as I was cabbage looking.

We departed Marham just as the sun was beginning to set and headed east to establish ourselves on the refuelling towline. After a few minutes, the radio sparked into life and a single receiver aircraft checked-in on the refuelling frequency. This was my prompt to stream the centreline Hose Drum Unit refuelling hose and to begin scanning the rear approaches to the aircraft through the Nav Radar’s periscope. I was still expecting our trade to be another Victor on the basis that other large aircraft types in the RAF were not fitted with refuelling probes and the fact that most fighters preferred the wing hoses to the centreline one. Soon, a distant speck appeared in the periscope viewfinder – our receiver was approaching. Gradually the speck took shape. ‘No, it can’t be!’, I thought. But, sure enough, the unmistakable lines of the huge delta-winged Vulcan soon appeared and, what was more, sticking proudly out of the aircraft’s nose was a refuelling probe! To compound my surprise, a familiar voice then spoke over the radio, for sitting in the Vulcan co-pilot’s seat was not a Vulcan co-pilot at all, but an experienced Air Refuelling Instructor (ARI) from the Victor Operational Conversion Unit. These ARIs were not only critical in producing a cadre of air-refuelling competent Vulcan pilots, but were also to take part on a number of operational Vulcan sorties in the nascent Operation BLACK BUCK.

Further surprises were to appear through my periscope over the coming weeks.

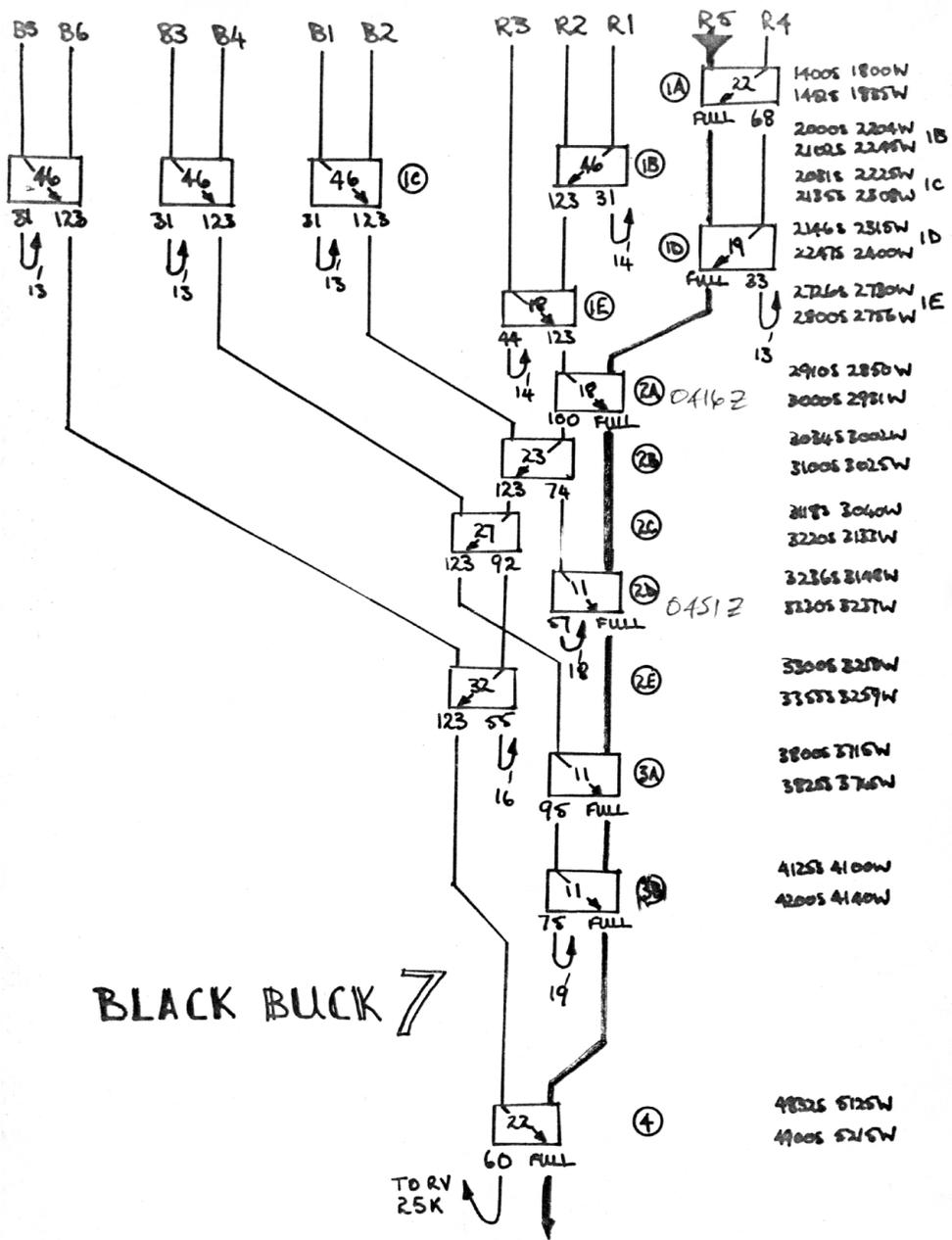
Vulcans soon appeared with underwing pylons, one of which carried a Westinghouse Electronic Countermeasures pod 'acquired' from the Buccaneer fleet. Within days, another Vulcan appeared with a strange missile attached to the other pylon. Frantic searching of Jane's soon provided the answer: it was an American AGM-45 Shrike anti-radiation (anti-radar) missile.

In late April and early May, we began to train with other large receivers, firstly Nimrod maritime patrol aircraft and then Hercules transports. The latter aircraft type caused quite a bit of head-scratching amongst the Victor fraternity, primarily due to the incompatibility in airspeed between the tanker and the receiver. Refuelling techniques therefore had to be rapidly adapted, resulting in lower-altitude refuelling brackets and the development of a new 'toboggan' manoeuvre. This manoeuvre put both aircraft in a shallow dive, which allowed the Hercules' Indicated Airspeed to increase to a safe margin above the Victor's stall speed, giving the overlap of performance required for safe in-flight refuelling.

These were hugely exciting days for the entire Victor Force and a truly remarkable baptism for a young first tourist. Even very experienced and well-established members of the Force were injected with a new sense of purpose and pride. For years, the Victor Force had been viewed as a useful support force, but here it was being thrown into the forefront of preparations for an expeditionary campaign where its existence would prove fundamental to success.

As the weeks progressed, more and more aircraft and crews from Marham were deployed to Ascension Island, yet the task of training additional large-aircraft crews, supporting the deployment of Harrier GR3 and manning the Victors which supported the Air Defence of the UK task kept those of us who remained at Marham extremely busy. I was in my element and learning fast, and my log book reflects an extraordinary total of 96 hours flown in May 1982. I was more than content with my lot, but on 6 June 1982 came the news that I had been longing for: our crew was to deploy to Ascension Island.

The narrative of the Black Buck raids needs no repetition here, and the masterful planning of the Air Refuelling Coordination Cell at HQ 1 Group remains one of the most incredible achievements of the entire Falklands campaign. The 6,750 nm round trip stretched the Victor Force to capacity. The Vulcan alone required no fewer than 17 air-to-air refuelling brackets and these were multiplied many times over by the numerous Victor to Victor refuelling brackets. Moreover, not only was weather forecasting in the region tenuous, but the navigation equipment of both aircraft pre-dated Inertial Navigation and Global Positioning and on many occasions it was only the glimpse of a tiny land mass at the edge of the radar screen that provided the assurance that Ascension Island was within reach. Although I personally played



The outbound refuelling plan for the Black Buck 7 mission flown on 12 June 1982 shows the complexity of the operation.

only a very small part in Operation BLACK BUCK, I feel extremely privileged to have flown two separate tanking sorties as part of the last Black Buck mission (Black Buck 7), but far greater than that was the palpable and justifiable sense of pride it imbued on both the Vulcan and Victor Forces.

I relate this early episode in my career not merely because the contribution of the Victor Force to Operation BLACK BUCK is still an under-estimated accomplishment but because, for me, the story captures the spirit of innovation and adaptability that has been a hallmark of the Royal Air Force throughout its first 100 years. The adaptation of legacy platforms in the build-up to and during the Falklands Conflict was quite remarkable and was only made possible through the strength of the relationship between the Royal Air Force and its industrial partners. In the years and campaigns that followed, such extensive platform modification became considerably more difficult. However, this did not subdue the spirit of innovation and adaptability: it just had to find alternative homes, such as in the development of new Tactics, Techniques and Procedures and revised Command and Control structures.



Victor K2 air-to-air refuelling tankers parked on the cramped dispersal at Wideawake airfield, Ascension Island.

“Weathering the Storm”

Conceived in the 1960s and developed throughout the 1970s, the Tornado GR1 entered operational service with the Royal Air Force in 1982. I began my long love affair with the aircraft in 1985 when I was selected for cross-over training from the Victor Force. I had learnt a great deal in my 3 years with 57 Squadron, flying in excess of 1,000 hours and maturing significantly as an aviator and officer, but I was now about to realise my lifelong dream to be a frontline fast-jet navigator.

I quickly developed a strong affinity with the aircraft, so much so, in fact, that within 18 months of arriving on Number XV Squadron at RAF Laarbruch, I had been selected for the Qualified Weapons Instructors (QWI) Course at RAF Honington. I recall the Course with great fondness, but I also realise in hindsight that, whilst it served a specific need at the time, the content of the course would do little to properly prepare us for what was to come. Clearly, such a bold statement deserves a fuller explanation...

In 1988, the Tornado GR1 QWI Course was very academic and the flying profiles were geared towards teaching squadron aircrew how to deliver bombs and cannon shells onto targets across the numerous UK Air-to-Ground ranges that existed at the time. Hours were spent calculating reversionary weapon settings which could be used should the aircraft's primary weapon system fail. But, in my view, too little time was given to experimentation and the development of alternative tactics. In 1991, this omission was to be thoroughly exposed on Operation GRANBY.

In 1990, Number XV Squadron was one of 3 Tornado squadrons at RAF Laarbruch, with the final corner of the airfield occupied by Number II (AC) Squadron who flew Jaguars in the tactical reconnaissance role at the time. My log book for the first seven months of the year reflects a very high exercise tempo, including: a period of 100ft Operational Low Level Flying (OLF) as a work-up for Exercise Red Flag; Exercise Red Flag itself; 100ft OLF and Instrument Meteorological Conditions (IMC) Terrain Following flying on Exercise WESTERN VORTEX in Goose Bay, Canada; and a Squadron Exchange with the USAF's 81st Tactical Fighter Squadron (a F-4G Wild Weasel squadron) at Spangdahlem in Germany. Although we did not know it at the time, this highly operationally focused seven months was to prove invaluable in the months to come, because on 2 August 1990, Saddam Hussein's Forces invaded Kuwait and the Tornado Force would change forever.

Number XV Squadron was not part of the initial build-up of air forces in the region, but our Squadron Commander was extremely confident that we would be there when the fighting started, as he knew that months of logistical preparation would be needed to support any offensive and also that diplomatic efforts would continue over many months to try to resolve the situation peacefully. In the remaining months of 1990, the Squadron was able to prepare for a possible offensive.

The first task was for the entire Squadron to become competent in air-to-air refuelling because until that time only certain individuals on Germany-based squadrons held that competency; our war plans had not included the need for in-flight refuelling. Due to my tanker background, I was one of the few navigator Air Refuelling Instructors at Laarbruch, so much of my time was spent teaching young, relatively inexperienced pilots the black art of tanking.

We also turned our thoughts to weaponry, and under the watchful eye of our Flight Commander Weapons, the Squadron QWI pilot and I instigated a programme of weaponry academics in the classroom, followed by rehearsal in the simulator and finally practice with live and simulated ordnance on UK ranges. By November the Squadron was more than ready to deploy to the Gulf region, but to where exactly? The question was soon answered: we were off to Muharraq in Bahrain.

There were many advantages to being in Bahrain, but there were also pitfalls. Clearly, comfort was one of the biggest advantages, but personally I found it extremely difficult to reconcile living in a 5-star hotel in Manama with the job we were about to do. There was a temptation, to which a number of the Squadron personnel succumbed, to adopt the view that this was just another detachment. One or two aircrew were quick to embrace the expat scene, and this became a major distraction for them. Despite a number of attempts, I found it extremely difficult, as their peer or subordinate, to positively influence their attitude. They would soon awake from their reverie once the shooting started.

Number XV Squadron was only one of a number of Tornado squadrons at Muharraq, but was the largest contingent. The approach adopted by the RAF was to nominate lead Tornado squadrons at each of the deployed bases and Number XV Squadron was given that status at Muharraq. This helps to explain why, in late December 1990, the Boss' designated pilot and I were taken aside. As the lead Squadron Commander, he had been read into the plans for the first three days of the air campaign. The tasking for this initial period had been deliberately and heavily scripted by General Horner (the Air Component Commander); thereafter tasking would follow the normal 24-hour Air Tasking Order process. The Boss wanted his pilot and me to plan every Tornado mission from Muharraq for this initial 3-day period. It goes without saying that the plans were incredibly sensitive and that the Boss was taking a calculated risk in briefing us in on every aspect of the plan. However, we had time at our disposal that he did not, and it was, in my view, absolutely necessary for him to delegate the responsibility. The task of planning every sortie for Number XV Squadron would have been daunting enough, but to plan for all of the other Muharraq-based Tornado units as well was a different challenge altogether. What exactly was our credibility with the other units? Would they understand our thought processes and the tactics we would employ? Had they undertaken the same extensive work-up training? What were their strengths and

weaknesses? Unfortunately, due to the classification of our work, these were questions that remained largely unanswered, yet they niggled away at me constantly.

For the Boss' pilot and me, our days took on a familiar pattern. We would plan, lead and debrief our respective four-ships on training missions during the day, then we would squirrel ourselves away in a locked office and plan each of the missions in minute detail long into the night. By the time the shooting war started on 16 January 1991, there was little more we could do in terms of planning. The die had been cast, and it would be up to the skill and bravery of the Tornado crews (with assistance or otherwise from Lady Luck) to determine how those first 3 days would pan out.

Bahrain's advantageous facilities and relatively liberal outlook made it a haven for the media. They could cover the air campaign in relative safety and without the deprivations of being in the field. They could also, if they were clever, achieve access to personnel without always going through the formalities. Thus, it came to pass that a floor of the hotel in which the Tornado crews were accommodated became occupied by the UK TV news companies. The graciousness of the reporters, the friendliness of the crews, and the genuine interest in our business was disarming and led to the situation where the aircrew and news crews were openly socialising together. This situation was not conducive to the maintenance of professional boundaries. On more than one occasion severe errors of judgement were brought about by over-fraternisation and familiarity. Don't get me wrong: I am fully behind media coverage of our operations, but it must be controlled, and this was not achieved effectively in this instance. At certain times during Operation GRANBY, I think media coverage became more than a necessary evil, and impacted negatively on some crews' operational performance. We have learned much in this regard since those early days of CNN and the 24-hour news cycle, but from a command perspective, it is worth remembering that appropriate control of the media keeps our people's focus on the operational tasks in hand and shares the burden among different crews and other personnel, whose different stories can make a huge impact on the credibility of the messages we seek to convey.

All of the Tornado sorties during the first 3 days of the air campaign were part of the Offensive Counter-Air phase and involved the targeting of airfields. For this role, the Tornado employed the bespoke JP233 runway cratering and denial weapon, which the aircraft either delivered across or along a runway. In the early hours of 17 January 1991, it was the weapon I delivered across the main runway at Tallil airfield in Iraq as part of an 8-ship of Tornados from Muharraq.

The delivery profile for JP233 involved a straight-and-level, 500kt pass at an ideal altitude of 180ft above the ground. In short, you had to fly directly overhead the target to deliver the weapon, making it a very high risk attack in anything other than a sanitised air defence environment and under the cover of darkness. When planning



Operation GRANBY: A Tornado GR1 returning to Muharraq after an attack against an Iraqi target.

the first 3 days' sorties, we had carefully considered the expected light conditions at the nominated time on target. Any attacks that fell in daylight hours or around dusk or dawn were considered far too high risk for JP233, so alternative attack profiles were chosen. Given the limited arsenal for the Tornado, it was agreed that the least risky profile which avoided overflight of the target area in daylight was a loft attack, where 8 x 1,000 lb general purpose bombs were effectively tossed at the target. In a typical loft profile, the Tornado would enter the target run at low level and, at a predetermined distance from the target, would pull up and climb to a point calculated by the aircraft weapons system at which the weapons would be released and, effectively, flung at the target. Once all 8 bombs were released, the aircraft would overbank and pull the nose down below the horizon. Bank and pitch would be reduced throughout the manoeuvre until the aircraft returned safely to low level. There were many critical elements to this delivery: firstly, pull-up had to occur at the predetermined point otherwise the aircraft's computer would fail to reach a release solution; secondly, the recovery had to be performed on instruments to avoid disorientation. Both the dynamic nature of the manoeuvre and the avoidance of target overflight were considered to complicate the enemy's targeting of the aircraft with ground-based air defence systems. It was during a loft attack on Ar Rumaylah airfield on the morning of 17 January 1991 that the first aircraft from Muharraq was lost.

That same night a second aircraft from Muharraq was lost post-target having successfully attacked Shaibah airfield in South Eastern Iraq with JP233. This was an audacious plan requiring skill and accuracy and was flown by crews from 27 Squadron. The attack was probably best suited to highly experienced Tornado aircrew, although I had no knowledge or influence over who would be chosen to fly it. Nevertheless, that now made it two aircraft lost on two of *my* plans, yet I didn't question my planning: I just cursed Lady Luck.

Despite not losing any aircraft during JP233 delivery (which is contrary to popular perception), it was apparent that the strength of the Iraqi airfield defences was causing consternation amongst the top brass and aircrew alike. It was unsurprising, therefore, that prior to a night 8-ship attack Al Jarrah airfield in West Iraq on 20 January 1991, the Boss called me aside and asked me to look at alternative tactics. On previous airfield attack sorties we had flown 8 aircraft with JP233 over an airfield on varying attack headings with the distinct intention of achieving maximum damage whilst at the same time complicating ground-to-air targeting. Flight Commander Weapons, the QWI pilot and I decided to plan the airburst of 1,000 lb bombs over the likely Anti-Aircraft Artillery positions to disable the guns. The plan was for 2 aircraft to deliver JP233 using tactical surprise, and for 4 aircraft to loft a total of 32 airburst 1,000 lb bombs over the gun emplacements and for the final two aircraft to follow up with JP233. Unfortunately, poor weather on the tanker towline resulted in only 4 aircraft arriving at the target. It is therefore impossible to fully evaluate the efficacy of these tactics, although they were used successfully on different occasions by the Dhahran Tornado detachment.

Eventually, mounting losses drove the Tornados into the unfamiliar medium-level regime. From the perspective of attrition, this was probably sensible, but weapon accuracy was to suffer considerably, because it had never been envisaged that the Tornado would employ ordnance from anything other than low level, so all the bombs initially dropped from medium level were effectively unguided. When delivered from higher altitude, bombs are subject to changing air density and wind speeds during their descent, so it is difficult to predict the amount of lateral drift for weapon aiming purposes. It was possible to enter a single value into the weapon system as compensation, but this relied on accurate weather forecasting and could never completely eliminate this inherent inaccuracy. The solution was to move to laser-guided munitions.

Until that moment, the laser-guided bombing role on Tornado was constrained to a few select crews on a couple of the squadrons who were trained specifically for the task. These crews worked alongside specific Blackburn Buccaneer crews who were skilled in the low-level designation role using the AN/AVQ-23E Pave Spike laser designation pod. Dropping from medium-level was pretty straightforward for the Tornado crews; they merely had to fly into a laser 'basket' on a prescribed heading and release their

weapons. It did, however, require remarkable skill from the Buccaneer crews; they had to maintain line of sight with the target to ensure that the laser energy was in the laser-guided bomb's field of view for the duration of its flight time. Failure to do so would mean that the weapon might fail to guide or expend all of its kinetic energy manoeuvring to acquire the laser energy resulting in its failure to reach the target. Although the Thermal Imaging Airborne Laser Designation Pod (TIALD) was rushed into service with the Dharhan Tornado detachment, it is no exaggeration to say that the success and accuracy of RAF laser-guided bombing during Op GRANBY was down to the professionalism and skill of a handful of Buccaneer pilots and navigators whose efforts have largely gone unsung, but whose effect on the success of Tornado medium-level bombing was disproportionate to their limited numbers.

Operation DESERT STORM officially ended on 28 February 1991. However, the Gulf Region – and Iraq in particular – continued to play an important part in my life until I retired in 2017, and never more so than in 2003 and Operation TELIC.

“Come all without, come all within, You'll not see nothing like the mighty fin”

In January 2003, I was entering what I was expecting to be my last 3 months in command of 31 Squadron 'The Goldstars'. The plan for my final 'hurrah' was to lead the Squadron on a 3-month operational tour in the Gulf on Operation RESINATE, the UK's contribution to the Coalition's Operation SOUTHERN WATCH, which had been initiated at the end of the First Gulf War to police a no-fly zone over Southern Iraq in order to limit Saddam Hussein's persecution of the Marsh Arabs. Tornado GR aircraft were the mainstay of the operation and in the years that had followed Operation GRANBY, the aircraft had gone through a number of major modification programmes which not only modernised the aircraft's avionics, but had also expanded its capacity to carry a vast range of different weapons and other stores. The aircraft had truly become the multi-role combat aircraft that it had originally been conceived to be.

Operation RESINATE was primarily a reconnaissance mission for the Tornado, and the aircraft carried either the RAPTOR (Reconnaissance Airborne Pod Tornado) long-range reconnaissance pod or the smaller, more tactical, Joint Reconnaissance Pod. Both sets of pods were in relatively short supply, so regularly the two-aircraft patrols carried TIALD pods and Paveway II laser-guided bombs. The rationale behind flying live-armed aircraft was to be able to respond to any Iraqi violation of the no-fly zone. If a violation took place, the Coalition Air Commander in the Combined Air Operations Centre in Saudi Arabia would decide how to respond; armed aircraft provided him with a rapid and proportionate kinetic response should he determine that to be the most appropriate course of action. Violations were relatively uncommon, and kinetic responses even more so, so I was not expecting the Squadron to drop very many weapons during our 3-month detachment. Nevertheless, we had conducted a comprehensive pre-

deployment work-up programme, including a live weaponry exercise in Arizona the previous September, so I was confident that we were well prepared for any eventuality. As I was expecting a fairly routine deployment, I had elected to fly with the Squadron's most junior pilot during the work-up and throughout the detachment itself. My pilot and I had therefore flown together frequently in the 4 months leading up to the deployment and I was delighted that we had gelled from the very beginning and had developed into an extremely competent and effective crew.

On 8 January 2003, we crewed-in as Number 2 of a pair of Tornados for what was to be my pilot's first experience of flying over Iraq. Both aircraft were carrying two Paveway II Laser-Guided Bombs, and both aircraft were equipped with TIALD pods. The sortie was planned as a theatre familiarisation for my pilot and a chance to practise various operational procedures. Take-off and departure from Ali Al Salem was uneventful and we checked in with the Tactical Director aboard the on-station AWACS. Moments later, whilst we were still in Kuwaiti Airspace, the Tactical Director came back up on the control frequency with urgent tasking for our formation. It was not a short-notice reconnaissance task that both aircraft were expecting, but instead a task to attack an Iraqi air defence facility in the vicinity of Tallil airfield as a response to an Iraqi infringement of the no-fly zone. So within minutes of crossing the Iraqi border for the very first operational sortie of his life, my young pilot found himself dropping two Laser Guided Bombs onto an Iraqi Air Defence Bunker, and I found myself attacking facilities at an airfield back where it had all begun for me in 1991.

On 3 February 2003, a dossier was placed before the UK Parliament, and efforts began to secure a new UN Security Council Resolution authorising the use of force in response to Saddam Hussein's defiance of the arms inspection regime. By the middle of February 2003, reinforcements began arriving at Ali Al Salem and by early March it became very clear that the UK would be a major contributor in any offensive action against Iraq. As the standing Operation RESINATE squadron, one might assume that our involvement would be a given, but Group and Station staff in the UK still favoured bringing us home at the end of March and replacing us with the next squadron on the rotation plan. Naturally, I arrived at the opposite conclusion and knew that any decision to pull us back would have a devastating impact on squadron morale. I also knew that I would probably have a very limited chance of success arguing with people in the UK and that my best chance of securing my Squadron's involvement would rest with persuading the in-theatre UK Air Component Commander that, with our currency in theatre and particularly with the RAPTOR pod, it made absolutely no sense to send us home. Thankfully, the argument struck home and all thoughts of the Squadron returning to Marham evaporated.

As March progressed, more aircraft and personnel arrived, and soon elements of five Tornado units were in place at Ali Al Salem. Alongside 31 Squadron were elements

of II(AC), IX(B), XIII and 617 Squadrons. Two other squadron commanders had deployed with their crews and I was very worried that this would create command and control confusion at a time when absolute clarity was required. Clearly, I had control of the Operation RESINATE mission, but no-one knew what command and control arrangements were foreseen for any follow-on operation. I raised my concerns with the UK Air Component Commander and he fully appreciated the necessity and sensitivity of the issue. I explained that I was not in favour of a 'lead squadron' construct because I had seen in 1991 how divisive it could become; rather, I favoured an approach whereby all elements were brought together as a wing under a single commander as *primus inter pares*. Once again, the UK Air Component Commander accepted my arguments and the Ali Al Salem Combat Air Wing was born.

My concept for the Combat Air Wing was to create a single warfighting unit with a strong team ethos and identity. But my major concern over having 5 different units under my command was that the intense competitiveness and rivalry that rightly exists between squadrons in peacetime could become very divisive in a warfighting situation. Effectively, my idea was to emulate the phenomenon that happens once every 4 years when the British and Irish Lions rugby team comes together! For a specific period of time, and for a specific purpose, national (read squadron) pride and rivalries can be put to one side and individual loyalty can be given to a larger all-inclusive team.



The 2003 Tornado Combat Air Wing emblem being applied to a Tornado GR4 at Ali Al Salem airbase in Kuwait.

I knew that the versatility of the Tornado would be exploited to its full extent by our tasking authority and that the Ali Al Salem Combat Air Wing would be asked to perform a multitude of different roles. I realised too that I needed to play to the strengths of the entire team, so I allocated specific tasks to specific elements within the Wing. Clearly, some tasks were more glamorous than others, and I think my own Squadron expected me to favour them when it came to role allocation. However, they were unaware that I had deployed the RAPTOR competence argument to secure our participation in the war and I was hardly going to renege on that promise. Number 617 Squadron were experts in the employment of the Stormshadow cruise missile, so it made perfect sense to exploit their expertise by allocating them the strategic targeting role. Number IX (B) Squadron was one of only two Air Launched Anti-Radiation Missile (ALARM) specialist squadrons, the other being my own; therefore, it made sense to me to allocate the Suppression of Enemy Air Defences role to their crews. In an echo of 1991, Numbers II(AC) and XIII Squadrons had undertaken an intensive period of mission-specific low-level SCUD hunting training prior to deployment and thus self-selected for that task. My own Squadron was to concentrate on strategic and tactical reconnaissance. Considered by many to be unglamorous, it was nevertheless vital to the Coalition's targeting and intelligence gathering process. Every element of the Wing was proficient in medium-level Air Interdiction and Close Air Support, and I was fairly confident that every crew on the Wing would get their 'moment in the sun' and deliver live weapons.

Part of the support package that I requested from the UK were two extremely experienced aircrew who I wanted to run the operations desk as totally impartial members of the team. Their impartiality was fundamental to the success of the Wing, as no-one could bring undue influence to bear in favour of one particular element or another. Shortly after their arrival, they suggested that I switch pilot so that I could lead four- and eight-ship formations into battle. I firmly rejected such overtures: firstly, I owed a loyalty to the young man I was currently flying with; secondly (and of equal importance) was that I saw my role not as a tactical leader, but as the man charged with leading the entire Wing. The time and effort saved by not leading individual missions was, in my opinion, far better invested in what really mattered to the operation as a whole.

Combat operations officially commenced at 0234Z on 20 March 2003. Personally, it all felt very different from 1991. The fear of the unknown which dominated the early sorties of Operation GRANBY was entirely missing: this was now familiar ground. Among the team, however, things were different, as for many this was their first taste of combat. I could feel their excitement and trepidation.

After a steady start, things began to ramp-up on 21 March when strategic targets were struck in central Baghdad. The Ali Al Salem Combat Air Wing was an integral part of this

phase. Stormshadow missiles were delivered on hardened targets in the city, ALARM missiles were fired to suppress Iraqi Air Defences, our low-level reconnaissance crews were SCUD hunting, and RAPTOR missions were flown to gather intelligence and conduct Battle Damage Assessment. The aircraft were holding up well and the crews were performing at the top of their game; the Combat Air Wing concept was working well.

It was not long, however, before its mettle was well and truly tested. On 23 March, in a tragic blue-on-blue, Flight Lieutenants Kev Main and Dave Williams were killed when their aircraft was shot down by a US Patriot surface-to-air missile on their recovery to Ali Al Salem. In the immediate aftermath, as I visited aircrew and groundcrew in their workplaces, I encountered a wide raft of emotions: shock, disbelief, anger even, but what shone through above everything was resilience, stoicism and resolve. The team had taken a heavy hit but it had come out fighting and more united and determined than ever before.

Coalition ground forces made swift progress towards Baghdad and the air targeting philosophy changed from Air Interdiction to 'Kill Box' interdiction. So instead of being given fixed targets to hit, the aircraft were sent to a particular grid box where on receipt of a 'friendlies clear' confirmation from the US Army Air Support Operations Centre or the US Marine Corps Direct Air Support Centre, the Tornado crews would seek out military targets of opportunity. This was not Close Air Support in the true sense of the phrase – there was no close control by a Joint Terminal Air Controller or Forward Air Controller – but it was still very different from anything that the Tornado had experienced in combat before. This move to Kill Box interdiction coincided with a decline in reconnaissance tasking. Therefore, as I had hoped and predicted, all of the Combat Air Wing crews were able to take the opportunity to deliver live weaponry. In an interesting departure from the delivery of explosive ordnance, on a couple of occasions the targets given to the Combat Air Wing had an associated high risk of extensive collateral damage should live ordnance be employed against them. The absence of a bespoke low-collateral weapon in our inventory led to an innovative solution: concrete-filled 1,000 lb bombs with no explosive content or fuze were fitted with laser guidance kits and dropped on the targets, meaning that the only damage caused was from the kinetic energy of the concrete itself.

I flew my last sortie of the war on 26 April. By then, the operational tempo had slowed to a dribble and the tasking was primarily a resurgence of reconnaissance, particularly in the north of the country. I was not to know at the time but that sortie was the penultimate time that I would fly the Tornado; the final time was when I handed the Squadron over to my successor some 4 weeks later.

Number 31 Squadron departed Kuwait on 28 April and the Combat Air Wing was disbanded the very same day. History will judge our collective success or otherwise,

but the way we innovated during Operation TELIC to tackle difficult targets and our adaptability in accomplishing roles for which we had not previously trained, reminded me again of the flexibility that the Royal Air Force had shown in the Falklands conflict twenty one years earlier, and which continues to be our Service's hallmark today. Reflecting on my experiences as aircrew in the Falklands and the two Gulf Wars, I am proud of what the Royal Air Force and all those involved in those operations achieved, and given my time again, I would approach each of the challenges I faced in exactly the same way.

OPERATION GRANBY AND THE DAWN OF PRECISION IN THE ROYAL AIR FORCE: A PERSONAL PERSPECTIVE

By Air Commodore Alistair Byford (Retired)

Biography: Alistair Byford is the Defence and Political Adviser to MBDA Missile Systems. He retired from the RAF in 2017 after a thirty-six year career which included over 4,000 hours flying the Tornado in the strike, attack and reconnaissance roles. He took part in 12 named operations, beginning with Operation GRANBY, the first Gulf War, and ending with Operation HERRICK in Afghanistan.



Air Commodore (then Flight Lieutenant) Alistair Byford with his navigator, Flight Lieutenant Steve Morris.

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INTRODUCTION

Just over a quarter of a century ago, on 20 January 1991, I flew my first combat mission. I was a first tour Tornado strike/attack pilot playing a very minor role in Operation GRANBY, the UK's contribution to the Coalition created to free Kuwait after its invasion by Saddam Hussein's Iraq. I clearly remember the heady mixture of excitement, anticipation and dry-in-the-mouth trepidation I felt as I pushed the throttles through the gate, engaged reheat and thundered into the night sky of the Gulf at the back of an eight-ship formation. I needed all the power I could get, because my newly desert pink-painted jet was heavily laden with eight 1,000lb iron bombs ('effectors' was a term for the future) borne on twin-store carriers, two large underwing fuel tanks, two AIM-9L Sidewinder air-to-air missiles plus jamming and chaff and flare pods for self-defence. Like the other fifteen aircrew in the formation I had no previous experience of battle, but I had a very well-developed expectation of what combat would look like, shaped and reinforced by the culture of the force I was part of, the equipment I flew and the training and indoctrination I had received since arriving on my squadron as a junior pilot nearly three years beforehand.

Arguably the 1991 Gulf War was the most significant watershed in the RAF's post-Second World War history. Although the RAF has been involved in many conflicts since 1945, up to Operation GRANBY the active involvement of its combat air elements had, in general, tended to be relatively brief and small-scale or niche in nature.¹ Whilst the RAF had played an important role in the Cold War, this was essentially as a peacetime deterrent force, largely untested in actual combat. The Gulf War changed all this. The majority of the available fast jet force was committed to battle, giving a whole generation of RAF personnel – including myself – their first taste of combat.² In addition (and this was not properly foreseen or understood at the time), the end of the conflict did not mark the expected return to peacetime flying and the *status quo ante*, but rather the beginning of a period termed by a former Chief of the Air Staff as the 'Age of Uncertainty', when the RAF would be committed to continuous combat operations which endure to the present day: at first in Iraq again, and then subsequently and in quick succession, Bosnia, Kosovo, Afghanistan, Libya and, most recently, Syria and Iraq once more.³

But the Gulf War has more significance for the RAF than merely representing a point of transition between an uneasy but enduring peace and the ceaseless combat operations of the succeeding two decades; the intensity of combat at scale challenged and then forced us to change our assumptions, doctrine and eventually our very culture, or what Clifford Geertz describes as 'the stories we tell ourselves about ourselves'.⁴ It also led to changes in equipment and training and, in particular, drove the transition from a static, home-based, Cold War force construct based on numbers, mass and attrition to the current paradigm centred upon the expeditionary delivery of highly precise effects in support of the joint campaign.

It is no coincidence that these changes paralleled a transformation in the strategic context. The Gulf War is neatly bookended chronologically by the fall of the Berlin Wall in November 1989 and the dissolution of the Soviet Union itself in December 1991. This heralded a switch in planning and purpose from force-on-force Clausewitzian wars of national survival to wars of choice fought 'amongst the people'.⁵ However, history tends to be cyclic, not linear, and although the RAF has spent most of the period since the Gulf War supporting counter-insurgency operations with the benefit of almost total air superiority, this will not necessarily be the case in even the immediate future.⁶ The recent emergence of a bellicose and militarily resurgent Russia, the rise of China as a military power, tensions in Korea and the proliferation of freely exported, highly capable anti-access and area denial weapons (particularly sophisticated surface-to-air systems such as the Russian S-300 and Chinese H-9 family) all threaten Western air supremacy and demand a renewed focus on peer or near-peer combat at scale. This in itself makes the Gulf War worth examining as the RAF's last experience of something like this kind of operation.

What follows is unashamedly a personal reflection based on my own experience as a junior pilot, and in no way reflects any officially sanctioned view of the war. This was a formative and sometimes visceral experience early in my career and I am very conscious it shaped my subsequent outlook, thinking and approach. Indeed, I often had to question whether my responses to later leadership or decision challenges were logical and based on the particular circumstances pertaining at the time, or represented a lazy and instinctive reversion to an early experience of combat which was not necessarily appropriate within a very different context. So I will not seek to assess strategy or analyse operational-level decision-making in 1991, but rather reflect my impressions at the sub-tactical level. My interpretation of events is purely my own; many of those also there will have seen and experienced the same events in a different way and will, no doubt, wish to challenge my assertions. So be it.

THE RAF IN 1990

What did the RAF that went to war in 1991 look, feel and think like? First and foremost, it was a peacetime air force, or at least my part of it – the fast jet force or combat air element – was. At a mess dinner at a Tornado base in the early nineties, it was exceptional to see anyone wearing a campaign medal, because there was simply no recent combat experience. A few hardy souls had been involved in the Falklands War nearly a decade previously and, of course, the support helicopter force was actively engaged in Northern Ireland, but these experiences were virtually non-existent within the Tornado force.

However, although we had no direct experience of war, we thought we knew what a war would be like. For almost fifty years the RAF had configured itself to fight the

Warsaw Pact in North-West Europe. This meant developing pragmatic ways of countering numerical superiority and operating in the face of a sophisticated, integrated air defence system. Because we could not resource an adequate suppression of enemy air defence capability to counter the surface-to-air missile threat at altitude (where the North European weather would, in all likelihood, preclude effective bombing with the technology of the day anyway), the solution was to attack at low level, under the radar and seek to exploit the advantage of surprise. It was accepted that casualties would be very heavy. For example, the planning assumption for the RAF Marham Tornado Wing's 'Day One' of the war 'Option Alpha' pre-planned conventional attack mission was up to a 50% attrition rate. But Cold War calculus determined this was a price worth paying in a war of national survival to suppress a key enemy airfield and help buy time for the cavalry, in the shape of the US forces, to deploy across the Atlantic and ride to NATO's rescue. There were many consequences of this philosophy which are worth exploring because of the impact they had on the conduct of the Gulf War. Three broad areas are worth considering: doctrine, equipment and training. In combination these generated a fourth: the particular and peculiar mind-set and institutional culture they engendered.

DOCTRINE

As has now been well documented, the RAF took a 'doctrine holiday' for a protracted period leading up to the Gulf War. This was because of the universally accepted premise that the only conceivable use of UK air power was as part of NATO operations in Europe. Events such as the Falklands War were dismissed as aberrations and, despite the efforts of individuals such as the then Director of Defence Studies, Group Captain Andy Vallance, to promote broader thinking about the wider employment of air power, the overwhelming consensus was that there was little point in expending intellectual effort on the strategic or even operational use of air power.⁷ Instead, the focus was firmly fixed on tactical excellence in the execution of tactics, training and procedures ('TTPs'), based on an expert knowledge of NATO Standard Operating Procedures (SOPs) and Standardization Agreements (STANAGs). Only tactical thought was therefore required to determine how we could best execute the various NATO Supporting Plans (SUPPLANS) by meeting our obligations to fill the slots allocated to us on the Air Tasking Order. Pre-scripted and carefully choreographed plans were rehearsed endlessly, but procedural excellence came at the price of a certain rigidity in outlook. It is easy to be sceptical about the value of doctrine, but at the very least it shapes mind-sets and sets institutional cultures and expectations. Without it - or at least thinking about it - the natural tendency of airmen to focus on the technical and the tactical at the expense of broader and more imaginative thinking was exacerbated. Undoubtedly, in 1991 this hindered our ability to understand and adapt quickly enough to the demands of a different sort of war in a very different sort of place to the war we had prepared for in such depth over such a long period of time.

Equipment

The commitment to low-level operations drove equipment procurement, in terms of both platforms and weapons. The Tornado itself is a good example. With a small wing area and high bypass turbofan engines, at low level it provided a smooth ride, excellent gust response, good fuel economy and a very stable weapons aiming platform. However, this all comes at the expense of altitude performance, and a war-loaded Tornado struggles to reach half the cruising height of a typical airliner. Clearly this has hindered its subsequent adaptability, and although the Tornado has provided absolutely sterling service and been repeatedly updated to keep it current as a weapons platform, this has been in spite of (rather than because of) its fundamental design and aerodynamic qualities.

The Tornado's weapons suite was also optimised for low-level employment: 1,000lb retard and ballistic bombs, the JP233 anti-airfield weapon, BL755 anti-armour cluster bomb and twin 27mm Mauser cannons were all designed to be used at low level.⁸ The only exceptions, and only guided weapons in the arsenal, were the AIM-9L Sidewinder for self-defence and the Air Launched Anti-Radiation Missile (ALARM) for suppressing air defences, although it was envisaged that both would be launched principally from or at low-level anyway.

The focus was on cheap, unguided weapons to provide big stockpiles and generate the mass effects required for large-scale attrition if and when the Cold War turned hot. The inherent inaccuracy of these weapons was offset by large warheads (so a near-miss would hopefully still achieve the desired outcome), or area effects (such as the football-field sized footprint provided by the cluster of 147 bomblets delivered by the BL755). The logical corollary of this philosophy was the WE177 tactical nuclear weapon, which like the rest of the Tornado's weapons was unguided and intended to be dropped from a low-level profile, but could generate an effect which would more than make up for any lack of accuracy. Clearly, the potential collateral damage effect of all these weapons was huge, but this was not expected to be a major factor in the kind of existential (and probably nuclear) conflict foreseen in a European Third World War.

Training

Operating at low-level is demanding and requires continuous practice, especially because the continuing dependence on unguided weapons meant the skill of the crew in aiming them, not technology, would determine if the desired effect could be achieved. Using dumb weapons at very low-levels required extremely accurate flying and set parameters to be achieved, demanding a very rigorous training regime which carried its own inherent risks. Bird strikes, controlled flight into terrain, mid-air collisions in uncontrolled airspace (in an environment where much larger numbers of aircraft were operating than today) and pilot error all imposed a steady toll of casualties which would be unacceptable and unsustainable in today's RAF. In the late eighties,

peacetime training attrition in the military fast jet force was running at 10-20 aircraft and crews (the equivalent of an entire squadron) every year, but this was accepted as absolutely par for the course.⁹ In itself, this loss-rate reinforced the prevailing mind-set that fast jet flying was an inherently risky business where casualties could not only be expected but were inevitable, in peacetime as well as war. It is sobering to reflect that the RAF has now lost nearly fifty of the original 220 Tornado GR aircraft originally procured: seven in combat, but over forty in flying accidents, mainly in the pre-Gulf War era.

Culture

The doctrine (or lack of it) and focus on low-level equipment and training tailored to a specific purpose, war against the Warsaw Pact in Western Europe, produced a powerful organisational culture and drove a particular mind-set. The Tornado force expected to fight from its well-found, hardened, permanent main operating bases in the UK and Germany and this was frequently tested and practised when we were called to demonstrate our readiness at no-notice by the siren call of the TACEVAL hooter.¹⁰ The expectation of what war would be like was shaped by the requirement to don nuclear, biological and chemical protection (flying even a simulator sortie wearing the AR5 aircrew respirator assembly still sends a shiver up the spine of Tornado aircrew of a certain age) and display our competence in our primary role: nuclear strike using the WE177 tactical nuclear weapon. All this cemented the widely-held view that a future war would be so devastating that conflict was almost inconceivable; so unlike the situation today, in all honesty very few of us joining the Tornado force in the late eighties truly expected to have to fight. After all, over the preceding fifty years, several generations of our predecessors had served full careers – those non-campaign medal wearing seniors at mess dinners – without having to do so. But if we did engage in conflict, our training and indoctrination led us to believe casualties would be very high, in both the conventional and nuclear stages. Within the expected context of global Armageddon and the near certainty of our eventual demise, the emphasis was on buying time and selling ourselves as expensively as possible, reflected in the number and type of weapons we would drop, from tactical nuclear bombs at one end of the scale to cluster munitions at the other. The focus was firmly on doing as much damage to the enemy as possible before our own inevitable destruction almost regardless of the consequences, including any associated collateral damage effects.

In summary, the pre-Gulf War RAF fast jet force had very little or no experience of war, and did not, in its heart of hearts, ever expect to fight, because the consequences would be so dire (for itself and everyone else) if it did. Events were to prove that it was very difficult to break the mind-set generated by almost fifty years of preparation solely for a certain kind of war. The force I flew with believed that in the unlikely event of being committed to combat, our fundamental purpose was to maximise weapon effects rather than put a premium on our own survival, and heavy casualties were inevitable.

This perception was only reinforced by the steady drumbeat of peacetime attrition that was accepted at the time as a matter of course. If anything, it was heightened, when the Kuwait crisis erupted in the summer of 1990, when we learned the Iraqi armed forces were largely equipped with the same types of Soviet aircraft and air defence systems we expected to encounter in Europe, so it was easy to assume this would be the sort of conflict we had prepared for: *'the war'* rather than *'a war'*.

DEPLOYMENT AND PREPARATION



Tornado GR1s at low level over the Saudi desert during a training flight.

One manifestation of the lack of previous combat experience was a certain naivety and the rules-free, 'all bets are off' approach that was sometimes apparent in the preparation phase in theatre. There was an unspoken assumption that tiresome peacetime rules and regulations were no longer necessary now we were 'on operations', an unaccustomed novelty for virtually the entire force. Unfortunately, this euphoria resulted in the avoidable loss of an aircraft and two crew in a low-flying accident immediately prior to the war, and demonstrates the importance of maintaining supervisory control and discipline even (and perhaps especially) under war-time conditions.

There was a widespread perception that this was a ‘once-in-a-generation’ event which was very unlikely to be repeated, and whilst some were dismayed at the prospect of impending combat (there was a very small ‘I didn’t sign up for this’ element), a much larger cohort was more concerned about the career implications of ‘missing out’, so a degree of ‘entry-ism’ was also evident as we prepared and deployed.

With hindsight, these pressures contributed to some flawed decision-making about force selection and deployment. One squadron lost its commanding officer in a flying accident during a pre-deployment work-up sortie in the UK. His successor had already been nominated as part of the routine command rotation process and naturally wanted to go to war with his new squadron following the loss of his predecessor. However, he was still converting onto the Tornado from another aircraft type, so he had to be rushed through the remainder of his course to deploy in time. Unfortunately, and with very limited hours on the Tornado, he was lost on his first mission flying a very demanding low-level flight profile at night which was unfamiliar to him. An interim commander (an outgoing squadron commander) was temporarily appointed to lead the squadron on its return to the UK whilst a new permanent commander was selected and put through the conversion course. Four squadron commanders in six months constituted a Second World War-level of attrition and the effect on squadron cohesion and morale may be imagined. The current force commander construct is obviously very welcome if one of the benefits is to free the principal decision-maker from the distractions of running a station, so he or she can concentrate on knowing and understanding the readiness and capabilities of the force he or she is responsible for more intimately. This should enable better and more informed operational judgements to be made, including selecting who is – and is not – fit and ready to deploy.

Another corollary of the perceived exceptional nature of the operation was the natural desire to assemble an ‘A-team’ (those considered as the best, most qualified and most experienced operators) to fight what was expected to be a one-off event as effectively as possible. However, events were to prove that under the stress of combat, age, experience and qualification did not necessarily provide a reliable indication of performance under pressure, and the ‘all-star’ concept proved to be no guarantor of best results. The more experienced aircrew naturally tended to be older and therefore family men with more to lose, and the relatively small number of ‘combat refusals’ we experienced tended to be confined to this group rather than more junior aircrew, who generally performed at least well enough and often outstandingly and, most importantly, were happy to fight a high-risk war.

The decision to cherry-pick crews rather than deploy as formed squadron units also had important implications for command. Core squadron cadres along with their commanding officers were deployed to the three main Tornado deployment bases used in the Gulf, but individual four-ship elements drawn from other squadrons were

used to augment them into larger non-formed units. This meant individuals within the detachments could be entirely unknown to each other (the Tornado force was at its peak at this time, with four main operating bases split between the UK and Germany) and there was no, or at best limited, access to the Form 5000 and other supervisory tools.¹¹ Given a squadron commander with the right leadership qualities and personality, the non-formed unit model might (and did) work well. However, at the location where I was based, the model failed utterly, and there was little effort, or even interest, in ensuring cohesion and inclusivity across the entire detachment. With a limited flow of information and direction, the individual four-ship force elements tended to turn inwards and fight their own war in their own way.

One important lesson I drew from this (and I accept this is based entirely on my own personal experience) was that Lord Trenchard saw the squadron as the building block of the RAF for a very good reason. Clearly, there will always be circumstances when augmentation or special skills are required to man a detachment adequately, but as a point of principle I would always prefer to commit to battle (either in command or under command) wherever possible as a formed unit. This might, on paper, appear to provide less capability than selecting the best qualified individuals from across a force, but is offset by the cohesion and spirit built up over time; particularly the shared understanding of the strengths and weaknesses of the whole team, all led by a known and established point of command.

EXECUTION

Phase One - Low Level

For the reasons previously explained, the Tornado force's natural specialism, by dint of training and equipment, was suppressing the Iraqi Air Force's ability to generate a high-tempo sortie rate by attacking the operating surfaces of its major airfields. This was an important task, as at that time the Iraqis possessed the fifth largest air force in the world, including modern Soviet types such as the Fulcrum fighter, and was expected to put up a stiff fight after Saddam Hussein had promised the Coalition 'the Mother of all battles'.¹² Early missions were flown at night against Iraqi main operating bases, using the specialist JP233 anti-airfield weapon, which dictated a very low-level attack profile along or across runways. Sometimes the main attack force was supported by aircraft lofting 'slick' (ballistic) 1,000lb bombs in an attempt to suppress flak (most airfields were heavily defended by anti-aircraft artillery), or ALARMS where intelligence had identified a surface-to-air missile threat. The attack formation was invariably part of a much larger package of aircraft, usually contributed by US armed forces and including fighter escort, stand-off jammers and 'wild weasels' with a hard kill, destruction of enemy air defence capability provided by the AGM-88 High-Speed Anti-Radiation Missile.

These missions had some success in denying the Iraqi Air Force the freedom to operate from its main operating bases, but the hazardous flight regime, demanding weapon

release profiles and strong air defences resulted in four losses (in combat accidents and by enemy fire) in the first week of operations: over 25% of total Coalition losses for about 2% of the sorties flown at that time.¹³ However, this high loss-rate was neither unexpected nor surprising to us given our chosen *modus operandi* and pre-conceptions of what an air war at scale would look like. Although unwelcome and tragic at a human level, in the light of the heavy defences and testing flight regime, the casualties were in line, or even less, than our expectations for this sort of operation. It was only when we looked elsewhere, at the very low percentage loss rate experienced across the rest of the Coalition, that we began to think that this might be a very different kind of war from the one we had expected, and one which might need to be fought in a different kind of way from that which we had trained for.

The need for a reappraisal was reinforced when it became increasingly clear that the Iraqi Air Force was not going to come out and fight. It seldom attempted to fly and, when it did mount sorties, these were to take refuge (and face internment with its erstwhile enemy) in Iran, so the absolute priority to deny operating surfaces to the enemy was no longer compelling; it was clearly pointless to suffer a very high casualty rate to deny the enemy a capability which he didn't appear to want to use. Consequently, the decision was made to switch to medium-level night operations, bombing from around 20,000 feet. At this altitude we were safely above most potential anti-aircraft fire, whilst the support package of jammers and weasels could adequately suppress the rapidly degrading Iraqi air defence system.

Phase Two – Medium Level

The difficulty was we had neither planned nor practised for medium level 'dumb' bombing operations. The Tornado's ground mapping radar and main computer were optimised and harmonised for low level, and we had to rediscover arcane planning features like mid-altitude winds and 'D'-factors. Just as importantly, we had no on-board or real time means of assessing where we had dropped our bombs or what, if any damage, we had inflicted (satellite imagery arrived days later and often not at all), so it was impossible to correct, adjust and adapt weapons-aiming methodology as we went along. The learning process included properly understanding safe separation when the relatively new multi-function bomb fuse was employed, and this cost another jet and captured crew when a bomb detonated prematurely beneath the aircraft. Steep angle dive by daylight was an exhilarating and enjoyable alternative to night medium-level bombing (at least for the pilot if not the navigator), and potentially promised greater accuracy. However, it could still be rather too exciting to be properly effective, as I discovered when diving through a carpet of heavy, 85mm-calibre flak to bomb a Scud missile assembly facility, and in practice the results were not markedly better than level bombing in terms of accuracy. It became apparent that area targets, such as oil refineries or barracks complexes, were the only targets we could attack from medium level with unguided weapons with any real prospect of success.

Phase Three – Precision

The limited effectiveness of medium-level bombing with unguided weapons underlined the need for a precision attack capability to be fielded as quickly as possible if the Tornado force was to retain its relevance in theatre. Ferranti had been running a programme since 1988 to develop a Thermal Imaging and Laser Designation (TIALD) pod, and two pre-production models (instantly named ‘Sharon’ and ‘Tracey’ after a pair of notorious characters in the ‘Viz’ adult comic) were rushed to theatre, along with the civilian technicians who would re-engineer and adjust them between sorties.

More significant heft was provided by a rapid deployment of Buccaneer aircraft equipped with Vietnam War-era Pavé Spike laser designation pods. With the addition of Paveway laser seeker and fin kits to modify existing ballistic 1,000lb bombs, we now had the basis for a fair weather, daylight-only co-operative designation (or ‘buddy-spiking’ capability), with a Buccaneer marking the target for two Tornado ‘bomb-trucks’ with three Paveway Laser Guided Bombs each acting as the delivery platforms. My four-ship was withdrawn from operations for a couple of days to practise the choreography required, and subsequently executed the first successful Buccaneer/Tornado co-operative strike on 2 February 1991, against a highway bridge over the Euphrates. Thereafter the detachment operated with considerable success, dropping bridges, cratering runway intersections and picking off individual hardened aircraft shelters and their contents. However, the Pavé Spike pods were old and weather-limited; the failure of one pod just after weapons release resulted in ‘wild’ (unguided) bombs and a major collateral event which, in a harbinger of things to come, attracted considerable press scrutiny and subsequently prompted a much greater focus on limiting collateral damage in the target selection and planning process.



Operation GRANBY: A Buccaneer of 208 Squadron taking off from Muharraq, Bahrain, carrying a Paveway LGB and Paveway Spike targeting pod on the port wing weapons pylons.

We experienced only one more combat loss, our sixth, on St Valentine's Day 1991, when a Tornado at the rear of a long 'daisy chain' of aircraft prosecuting a single axis attack was destroyed by a surface-to-air missile at medium altitude. This prompted some soul-searching about complacency, especially whether ease of planning was trumping considerations of operational efficacy. I claim no particular prescience for earlier flagging this up as a matter of concern, but at this stage of seniority I was a career tail-ender and was therefore only too aware that nearly all of our combat losses were concentrated at the rear of formations. Consequently, I insisted (within my four-ship at least) that we compressed time on target brackets, planned multi-axis splits and varied ingress and egress routing. A lesson which has remained with me since 1991 is that however routine the operation appears to have become, however tired you are and however tedious the planning process is, your own personal survival should provide sufficient motivation for you to take the time to persevere to produce the most operationally effective plan; and you owe this extra effort to those you are leading if not yourself. The 'Kiss principle' (Keep it Simple, Stupid!) is admirable as far as it goes, but it only goes so far, particularly when you are flying as Number 8 in an eight-ship formation.

CONSEQUENCES – THE DAWN OF THE PRECISION ERA

I returned from the Gulf in the spring of 1991 a little older if not necessarily wiser. After a brief sojourn as an instructor at Tornado Weapons Conversion Unit - seemingly entirely untouched and untroubled by the war and teaching the same weapons events in exactly the same way as it had when I had graduated three years beforehand - I returned to front-line squadron flying, and another dozen operational detachments over the next fifteen years. So what messages did I take away from those few intense and eventful weeks in 1991?

First and foremost, the Gulf War indicated that the age of precision had arrived. The RAF was already drawing down in size as the government of the day sought to reap the post-Cold War 'peace dividend', and clearly a much smaller combat air element would need a more precise weapons effects capability if it was to generate the required outcomes. It was also clear that we would need to husband our resources better, as each aircraft and crew would be an even more valuable asset, so we needed to minimise combat losses as well as maximise weapon effects.

Events in 1991 demonstrated that these demands were not compatible with the unguided weapons we were principally equipped with. They might be cheap, simple and plentiful, but could only be delivered with little, if any stand-off, forcing attacking aircraft to over-fly targets in the heart of enemy air defences. Weapons such as the JP233 limited operational choice by dictating that particular parameters were met, which forced us to adopt rigid weapon release profiles and made us predictable and therefore more vulnerable. The high workload and precise flying demanded expensive and risky training to assure proficiency, which also imposed significant costs. Furthermore, the

inherent inaccuracy of dumb weaponry meant targets had to be attacked by large numbers of aircraft, or repeatedly re-attacked, to guarantee the desired outcome was achieved, exposing the force to extra risk. Finally, the lack of accuracy meant high numbers of weapons, weapons with a very large kinetic effect, or clusters of weapons were needed to neutralise targets, greatly adding to the risk of collateral damage. In the Gulf War, this became an increasing issue, and in the operations which followed, where popular and political consent was required to support continuing participation in conflicts widely regarded as discretionary ‘wars of choice’, it has become progressively more unacceptable. It is therefore no surprise that each operation subsequent to the Gulf War has seen an increasing percentage of precision or complex weapons used, and we have now reached the point where, other than the gun, we have no unguided weapons in the combat air inventory.

CONCLUSION

Inevitably, my reflections on the RAF’s role in Operation GRANBY focus on the events that made the most impact on me personally, so these tend to be biased towards what went wrong rather than what went right. It is easy, particularly with hindsight, to pick over the tactical detail, but I believe the fundamental issue was our collective failure – as a force, and at every level – to comply with Clausewitz’s famous dictum that the most important duty of a commander is to understand the kind of war he is fighting.¹⁴ Almost every issue we experienced, I contend, may ultimately be traced back to a failure to engage intellectually with the operation prior to the conflict, and instead fall back too readily on our assumption of what kind of war it would be and apply the tactical template we were most comfortable and familiar with. This is an enduring problem which we need to challenge properly every time we commit to operations, because each conflict will be different, and each will therefore demand a different approach.

In many ways, the Gulf War was the progenitor of the next two decades of operations and the current ‘Western way of air warfare’, based around the principle of minimum force and the delivery of low-collateral and highly precise effects in discretionary wars of choice. However, I think we should be equally wary of applying this template to future air operations without very careful thought. A conflict involving peer or near-peer adversaries employing sophisticated capabilities would look very different to our recent experiences. Numbers, mass and attrition will become more important again, and issues like the affordability of weapon stockpiles and the balance between collateral and kinetic effect are all likely to need reappraisal. Interestingly, and despite its iconic information operations campaign, as a recent UK Air Component Commander pointed out, the Russian air campaign in Syria and Iraq has been overwhelmingly based on dumb and cluster munitions to deliver mass effects.¹⁵

In closing, I would like to redress the balance to some extent by highlighting some of the things we *did* get right. Although we may have been slower than we should have

been in identifying the need to adapt, once the requirement for change was identified, transformation was quick and decisive, including the innovative adoption of novel and untried techniques and equipment and the insertion of new capability into theatre. It was particularly laudable that we demonstrated the flexibility to extemporise 'in contact' whilst conducting high intensity air operations, and in the end made a hugely significant contribution to the air campaign and the ultimate success of the Coalition in freeing Kuwait from occupation. However, one note of caution is that in 1991 we had the force depth, capacity and resilience (with 25 fast jet squadrons) to make these sort of changes quickly: it would be much more difficult to generate rapidly additional resource from today's painfully thin combat air element.

I am also very proud of the resilience the force showed in absorbing the heavy losses of the first week, and morale never really dipped significantly, although a certain gallows humour was evident from time to time. On a personal level, my initial anxiety was largely confined to whether I could do the job properly without letting myself, my navigator (like 'effectors', 'weapon systems operator' was a term for the future) and my squadron down by making simple or stupid mistakes under pressure; ironically, it became more difficult later on at an arguably less dangerous stage of the campaign, when I knew I could do the job, so had more time to think about the threat, the risks involved and what we were doing. I have nothing but respect for the older and more experienced aircrew with extensive family commitments. Many clearly had very real concerns about their own personal safety, but nevertheless demonstrated the grit and courage to carry on regardless. I clearly remember one formation leader trying to plan a route when his hand was shaking so much that he couldn't hold a ruler. With the arrogance of youth (and to my eternal shame) I was inwardly dismissive of him at the time, but with hindsight recognise he was a much braver man than I to find the courage to contain his feelings and still function effectively. Certainly, I have found my own outlook and response to danger on operations to be very different at later stages in my career (and with the changing circumstances of family and personal life) than it was when I was a twenty-something junior pilot with very little to lose; so perhaps war really is a young person's business.

Finally, whilst the contribution of the Tornado force of the early nineties to Operation GRANBY may not have been flawless, it was significant and ultimately very effective. It also set the conditions for the Tornado's subsequent unprecedented and unbroken record of operational service where it – and the men and women who fly and support it – has provided the backbone of the RAF's combat capability for over a quarter of a century, continually evolving and adapting to progressively raise its game and deliver the hard edge of air effects right through to Operation SHADER today. As a force, it is much smaller, but far more capable and, dare I say, professional than the force I went to war with back on that humid Gulf night in January 1991. Nevertheless, I still count myself as being very fortunate to have benefited from that experience so early in my

career. As a military pilot the ultimate test of your ability and professionalism may only be provided by combat; and inevitably you will always wonder if you have what it takes until you have enjoyed the opportunity to prove yourself in battle. So perhaps my feelings at the time - and those of the rest of the force, particularly during that first, difficult week - are, as always, best encapsulated by a little Shakespeare:

*And gentlemen in England now abed shall think themselves accursed they were not here, and hold their manhood's cheap whiles any speaks that fought with us.*¹⁶

NOTES

¹ Even in the Korea War RAF combat air engagement was limited. Suez and Malaya involved significant combat air elements but involvement in the Falklands War was confined to a single Harrier GR1 squadron.

² Although the participation of the air defence force was constrained to rear area defence and the Harrier force was not deployed.

³ Air Chief Marshal Sir Stephen Dalton, Chief of the Air Staff, 'Air Power in an Age of Uncertainty', speech at the Royal United Services Institute, London, 13 July 2013.

⁴ Clifford Geertz, *The Interpretation of Cultures* (London: Basic Books, 1973).

⁵ See Rupert Smith, *The Utility of Force: War in the Modern World* (London: Allen Lane, 2005).

⁶ This is, of course, not to say western air power has been completely uncontested: surface fire, improvised explosive devices and information operations have all been used to degrade the effectiveness of air operations whilst significant and sophisticated air defence threats existed in the campaigns in Iraq (2003), Bosnia, Libya and most recently Syria.

⁷ Andrew Vallance, *Air Power - Collected Essays on Doctrine* (London: HMSO, 1990).

⁸ Ballistic or 'slick' 1,000lb bombs could be dropped from medium level, but before the War were almost exclusively delivered using a loft profile from low level.

⁹ In the five years prior to the Gulf War, UK military fast jet losses were as follows: 1986 - 13, 1987 - 18, 1988 - 14, 1989 - 11 and 1990 - 15.

¹⁰ The NATO Tactical Evaluation (TACEVAL) process culminated in major, no-notice exercises designed to test all aspects of readiness, force generation and tactical execution.

¹¹ The Form 5000 is an individual's personal flying record and includes any supervisory issues or concerns.

¹² Saddam Hussein, speech marking the 70th Anniversary of the Iraqi Army, 6 January 1991.

¹³ RAF Tornado Losses During Desert Storm, www.defenceoftherealm.worldpress.com, accessed 13 April 2018.

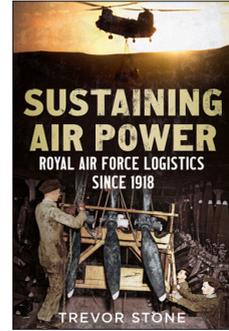
¹⁴ Carl von Clausewitz, *On War* (Princeton: University Press, 1976).

¹⁵ Air Commodore Johnny Stringer, press statement at MOD London, 3 November 2017.

¹⁶ Shakespeare, *Henry V*, Act 4 Scene 3.

Book Reviews

SUSTAINING AIR POWER: ROYAL AIR FORCE LOGISTICS SINCE 1918



BY TREVOR STONE

PUBLISHER: FONTHILL MEDIA 2017, (ISBN: 978-1-78155-635-1), 496 PAGES

REVIEWED BY WING COMMANDER JAMIE CAMERON

Biography: Wing Commander Jamie Cameron is an RAF Logistics officer. Currently employed as the A4 Force Chief of Staff, he has undertaken a broad range of tours including commanding the Logistics Supply Training Sqn, OC Logistics Wing in Cyprus and acting as the UK Military Senior National Representative in Bosnia Herzegovina. He has a keen interest in air power and history.

INTRODUCTION

Doctor Trevor Stone is a retired RAF Logistics Wing Commander with 35 years' Service experience. He holds a PhD from the University of Exeter and, as the RAF Logistics Branch Honorary Historian and custodian of the RAF Logistics Heritage Collection, is well placed to write the authoritative history of the Branch.

Sustaining Air Power is a comprehensive and well researched treatise of RAF Logistics from 1918. As the first publication to cover the totality of logistics since the formation of the RAF it serves as both a chronological reference and a vivid history. Throughout, the author has struck a fine balance between academic rigour and readability. The author links the evolution of logistics to the evolution of the wider RAF as the organisation adapted to changes in threats, technology, geo-politics and adversaries. Supply, air and ground movements, fuels, evolving home and overseas deployment and operational models, technological development and personnel are all covered in depth. The publication is interspersed with well-considered, sometimes colourful vignettes which aptly illustrate the specific operation or development under consideration. Engendering a wider understanding of logistics in the past, today and going forwards is

key for both logistics practitioners and leaders and this is clearly and effectively detailed by the author. Indeed, in the book's preface Professor Richard Overy states that 'this book will move Royal Air Force (RAF) supply, distribution and maintenance out of the wings to have a place at the stage'.

The book is split into three parts: the first is a chronological overview covering the evolution of RAF logistics since 1918; the second part details specific elements of RAF logistics and the final section covers key conclusions.

In part one of the book, Dr Stone illustrates the challenges faced by logisticians during World War One, the Inter-War years and World War Two and key events are unpicked. Dr Stone describes how the RAF's logistics organisation developed, reaching its peak mass in 1945 and details the sheer scale of expansion in both the Home Base and globally. The significance of dedicated Depots in sustaining air power is examined through statistical analysis and first-hand accounts from across the rank range.

Stone covers the transition from a Cold War, static European focussed organisation to that of Expeditionary Operations in detail clearly demonstrating the inherent adaptability of the overarching C2 structure and flexibility of those tasked with the development and delivery of supporting logistics effect over that 30 year period. Specifically, he identifies the significant impact upon logistics resultant from the 'Options for Change' and 'Frontline First' peace dividend initiatives and closure of most RAF Germany Stations in the 1990s. The post-Cold War Expeditionary era is covered in detail through his summation of operations in the Middle East, Balkans and Afghanistan and most recently Operations LUMINOUS and SHADER in the Levant.

In part 2 of the book the contribution of far-sighted individuals is acknowledged in the analysis of the development of organisations such as Tactical Supply Wing, Expeditionary Logistics Wing and the United Kingdom Mobile Air Movements Squadron. Whilst now part of the fabric of RAF Logistics, the formation of such organisations demonstrated significant forethought. Another fundamental development in RAF logistics was that of IT. Stone argues that the introduction of automated data processing in 1943 and the development of IT in the ensuing years was at the leading edge of its field. Associated dividends included a significant reduction in manpower through automating hitherto manual processes and increasing visibility resulting in improved availability of materiel.

This publication is the story of an evolving organic entity spanning the last century. It highlights both the importance of understanding the history of logistics and the need to focus on the future. Throughout the history of air power logistics, key themes have endured such as a sense of identity; the ability to learn lessons from the past; far-sightedness and adaptability to change; and the importance of being at the forefront of

innovation and technological development. The research and well-constructed analysis means that this is a must-read book for RAF logisticians past and present. More widely, this book is recommended to anyone who would wish to better understand how logistics has created the conditions to allow the RAF to deliver operational effect, globally over the last 100 years.

Book Reviews

THE ROYAL AIR FORCE DAY BY DAY 1918-2018



BY AIR COMMODORE GRAHAM PITCHFORK

PUBLISHER: THE HISTORY PRESS, 2017, (ISBN 978-0-7509-7973-3), 424 PAGES

REVIEWED BY DR ALASTAIR NOBLE

Biography: Dr Alastair Noble has been a Historian in the Air Historical Branch (RAF) since September 2015. He was previously a Senior Lecturer in Defence and International Affairs at the Royal Military Academy, Sandhurst and Senior Researcher in the Foreign and Commonwealth Office Historians section.

INTRODUCTION

This updated, revamped edition of Air Commodore Graham Pitchfork's *The Royal Air Force Day by Day* has been published, at the request of the RAF, to mark the 100th anniversary of the formation of the Service. The foreword by the Chief of the Air Staff reinforces the official acknowledgement of Pitchfork's work. Indeed, this is an invaluable diary of important daily events in the RAF's rich history. The clear and concise entries not only chronicle major milestones and great air battles but reach beyond these to incorporate diverse snapshots of everyday life in the RAF and the tasks, traditions, culture and lifestyles this has encompassed. This book looks at the RAF from all angles, at all levels and at all stages in its history. Although matters relating to the Second World War are crucial to the story and are not neglected, little known interwar operations are brought to life, while Cold War and post-Cold War activities are recounted with relish. As well as highlighting the RAF's constantly evolving role in air defence and the delivery of air power, its long-standing role in peacekeeping and international aid operations across the globe is underlined.

This is a book which is good to look at. It is a book which is very easy to dip into. However, it is somewhat harder to extract oneself from it. The sheer breadth of the

entries partially account for this, coupled with the sure touch of the author in conveying the developments and events which shaped the Service. The extensive, carefully selected black and white photographs which accompany the text likewise endeavour to cover the varied facets of RAF life through the decades.

This book also provides an excellent starting point. It is a valuable 'one stop shop' for RAF history, providing an impetus for further reading on the people of the Service, their achievements and their gallantry. On the latter, there is a particular focus on RAF recipients of the George Cross and Victoria Cross. The brief entries provide a flavour of the courage of individuals, an enduring feature of the RAF's history. In addition, this new edition features more panels covering particular aspects in greater detail, ranging from the first flight to India (December 1918-January 1919) to the Olympic Operation GUARDIAN in 2012. The helpful cross-referencing leads to the discovery of yet more fascinating facts. These frequently emphasise the versatility of the RAF, its aircraft and its aircrew. For instance, the Handley Page V/1500 four-engine heavy bomber, *Old Carthusian*, which made the long flight to India in 1918/19 was soon pressed into service bombing the Amir Ammanulla's palace in Kabul; this display of air power severely denting the morale of the insurgents and helping to bring the conflict to a close.

Although it has an incredibly wide and challenging remit, *The Royal Air Force Day by Day* has sound foundations. It is the product of years of wide-ranging research, incorporating archival work at The National Archives and Air Historical Branch (RAF), as well as a thorough examination of papers, journals, magazines and books central to the RAF's past and present. Indeed, to a degree this book goes beyond its chronological remit with entries and photographs in respect of the innovations and deeds of the pre-April 1918 Royal Flying Corps and Royal Naval Air Service.

At the outset, Air Commodore Pitchfork took on a stiff task with this ambitious project. The revised, updated edition builds on the success of the 2008 edition and will be a most welcome and durable addition to the many books published to celebrate the centenary of the Service.



<https://www.raf.mod.uk/our-organisation/units/centre-for-air-power-studies/>

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 **ROYAL
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