ROYAL AIR FORCE

HISTORICAL SOCIETY

JOURNAL

30

First published in the UK in 2003 by the Royal Air Force Historical Society

ISSN 1361-4231

Typeset by Creative Associates
115 Magdalen Road
Oxford
OX4 1RS

Printed by Advance Book Printing
Unit 9 Northmoor Park
Church Road
Northmoor
OX29 5UH

CONTENTS

ROYAL AIR FORCE HISTORICAL SOCIETY

President	Marshal of the Royal Air Force Sir Michael Beetham GCB CBE DFC AFC
Vice-President	Air Marshal Sir Frederick Sowrey KCB CBE AFC

Committee

Chairman	Air Vice-Marshal N B Baldwin CB CBE FRAeS
Vice-Chairman	Group Captain J D Heron OBE
Secretary	Group Captain K J Dearman
Membership Secretary	Dr Jack Dunham PhD CPsychol AMRAeS
Treasurer	J Boyes TD CA
Members	Air Commodore H A Probert MBE MA
	*J S Cox Esq BA MA
	*Dr M A Fopp MA FMA FIMgt
	*Group Captain C J Finn MPhil RAF
	*Wing Commander C McDermott RAF
	Wing Commander C Cummings
Editor & Publications Manager	Wing Commander C G Jefford MBE BA

**Ex Officio*

SELECTED ABBREVIATIONS

AAA	Anti-Aircraft Artillery
AAFCE	Allied Air Forces Central Europe (NATO command)
AAR	Air-to-Air Refuelling
ABDR	Aircraft Battle Damage Repair
ACAS(Ops)	Assistant Chief of the Air Staff (Operations)
ACAS(OR)	ACAS (Operational Requirements)
ACE	Allied Command Europe (ie a NATO command)
ACTIVE EDGE	A NATO-sponsored aircraft generation exercise
AD	Air Defence
AEF	Air Experience Flight
AEW	Airborne Early Warning
AGI	Intelligence Gathering Auxiliary vessel
AIM-9	US designation for the Sidewinder missile
AMC	Alert Measures Committee
ARM	Anti-Radiation Missile
ASF	Aircraft Servicing Flight
ASI	Ascension Island
ASMA	Air Staff Management Aid
ASW	Anti-Submarine Warfare
C2	Command & Control
CAS	Chief of the Air Staff
CDS	Chief of the Defence Staff
CE(RAF)	Chief Engineer (RAF)
CLFFI	Commander Land Forces Falkland Islands
COS	Chief Of Staff
CVS	Aircraft Carrier
DACT	Dissimilar Air Combat Training
DCDS(C)	Deputy Chief of Defence Staff (Commitments)
DFGA	Day Fighter/Ground Attack
DIS	Defence Intelligence Staff
DOB	Deployed Operating Base
DWR	Duke of Wellington's Regiment
ELINT	Electronic Intelligence
EWAU	Electronic Warfare Avionics Unit
FAC	Forward Air Controller
FAP	Fly Away Pack
FOB	Forward Operating Base

FWOC	Forward Wing Operations Centre
GBAD	Ground Based Air Defence
GPMG	General Purpose Machine-Gun
HDU	Hose Drum Unit
IAM	Institute of Aviation Medcine
IDC	Imperial Defence College
IGB	Inner (sometimes Inter) German Border
INAS	Integrated Navigation/Attack System
JCS	Joint Chiefs of Staff
JHSU	Joint Helicopter Support Unit
JTP	Joint Theatre Plan
LGB	Laser Guided Bomb
LI	Light Infantry Regiment
LRU	Line Replaceable Unit
MRR	Maritime Radar Reconnaissance
ORBAT	ORder of BATtle
PARA	The Parachute Regiment
PE	(MOD) Procurement Executive
PJHQ	Permanent Joint Headquarters
PMO	Principal Medical Officer
RCDS	Royal College of Defence Studies
ROE	Rules Of Engagement
RWR	Radar Warning Receiver
SAM	Surface-to-Air Missile
SH	Support Helicopter
SHAPE	Supreme Headquarters Allied Powers in Europe
SHORAD	SHORt Range Air Defence
SOP	Standard Operational Procedure
SSN	Nuclear Powered Attack Submarine
STANEVAL	1970s term for ‘Standards Flight’
STC	Strike Command
TACEVAL	TACtical EVALuation
TCW	Tactical Communications Wing
TEZ	Total Exclusion Zone
TIALD	Thermal Imaging Airborne Laser Designator
TTTE	Tri-National Tornado Training Establishment
UOR	Urgent Operational Requirement
VCAS	Vice-Chief of the Air Staff

THE RAF IN THE FALKLANDS CAMPAIGN

RAF MUSEUM, HENDON, 8th APRIL 2003

WELCOME ADDRESS BY THE SOCIETY'S CHAIRMAN

Air Vice-Marshal Nigel Baldwin CB CBE FRAeS

Ladies and Gentlemen

It is a pleasure to see so many of you here this morning – the first time, I think, that we have had a full auditorium with some 180 members present.

Before I introduce our Chairman for the day, let me say my usual thanks to Dr Michael Fopp and his staff here at the Museum, for allowing us to use their excellent facilities and helping us so much with the production of the day.

Our Chairman today is Air Marshal Sir John Curtiss. In 1982, he was AOC 18 Group, the maritime Group with its Headquarters at Northwood. During the Falklands campaign, he was the Deputy Commander-in-Chief (deputy to Admiral Sir John Fieldhouse). But he was also the Air Commander, and thus the most senior airman in the operational chain of command. He controlled all of the RAF aircraft assigned to the conflict other than those embarked. We could have no better person to keep today's disparate crew of speakers under control.

Sir John – over to you.

INTRODUCTION BY SEMINAR CHAIRMAN

Air Marshal Sir John Curtiss

Nigel Baldwin and his team seem to have timed this event with remarkable prescience, although I'm not sure that, when they selected the topic for this seminar, they could really have predicted that our Forces would once again be on active service, this time in Iraq. But it is a fact that just twenty-one years ago, on 2 April 1982, Argentina invaded the Falkland Islands. Three days later, the aircraft carriers *Hermes* and *Invincible* sailed at the head of what was to become one of the largest Task Forces in recent history, resulting in the recapture of the islands after only seventy days. This indeed was one war that *would* be over by Christmas.

It is one thing to start your life in war, as I did, but it was perhaps even more satisfying to end one's career, after forty years, following the conclusion of a very different and very successful one. It may be of passing interest to note that, in many ways, I found it a lot easier to fly with Bomber Command during WW II than I did being the Air Commander in the Falkland campaign. In other words, going to war is very much easier than sending others to war.

But we must move on, as we have a lot to get through today. We have some sixteen speakers. Most of them played an active role in the campaign and all are distinguished. Indeed we already have two former Chiefs of the Air Staff in the auditorium and our current CAS will be joining us later. We are fortunate indeed. We also have the largest audience ever assembled for any of the Society's meetings and I know that many of those who are here today served in the campaign. Some of you will, I hope, wish to participate in the question period and I welcome that, but all of this puts considerable pressure on the time available to us, so I do ask you to exercise great discipline: the speakers to stick to their time; everyone to return promptly after lunch and, when it comes to the question period, please make sure that you give your name before you ask your question; keep your question succinct and don't make speeches. So, having set a good example by finishing well within my own allotted five minutes I will hand over to our first speaker.

THE VIEW FROM THE MOD

Air Commodore Henry Probert

A Cambridge history graduate, Henry Probert joined the RAF Education Branch in 1948. During the 1960s he served in Singapore and on the Staff College Directing Staff before becoming, in 1976, Director of RAF Education. After retirement in 1978 he spent the next eleven years as Head of the Air Historical Branch. He is the author of three notable books, his most recent being his acclaimed biography of Sir Arthur Harris.

At the time of the Falklands operation I was running the Air Historical Branch in the MOD and well before it ended in June we had been made responsible for gathering together the more important of the rapidly accumulating documentary records. Subsequently, these needed sorting and indexing and we were then asked to compile a written narrative history covering the RAF's total contribution to the Falklands conflict – Operation CORPORATE. This would be for official use within the Service and later by official historians; it would be suitably classified. So over the next few years I and two of my historians, together with several appropriately qualified serving officers who were attached to us from time to time, analysed the copious material and put it together as a connected account. It was published in 1988 but remains classified; eventually it will be opened, but that day has not yet arrived.

To assist our research we decided early on to interview on tape as many as possible of the significant personalities, a number of whom are here today and able to speak for themselves. But Sir Ken Hayr, who played one of the most influential roles, is not. I myself did his interview – we had already known each other for some years, which helped, and I remember clearly how determined he was to assist me and my colleagues to get the story right. He took no persuading of the importance of properly recording and analysing this unique episode in the RAF's history – and he not only elucidated aspects of the story which I might otherwise never have appreciated but also pointed me towards further invaluable sources of information.

So my purpose now, having suitably refreshed my memory, is to mention a few of the things that I think he might have said about his work in London had he been here today – and in so doing to pay tribute to a man whom so many of us remember as one of the RAF's finest officers. In early 1982 he was serving in the Air Force Department as Assistant Chief of Air Staff (Operations) [ACAS(Ops)], answering through Sir David Craig (VCAS) to Sir Michael Beetham (CAS).

It is very important for us to bear in mind today that a conflict in the South Atlantic had never been envisaged, never mind planned for. The RAF command structure at that time was essentially geared to the UK's NATO commitments and control of the RAF's operational resources lay with Strike Command. It was not ACAS(Ops) who controlled them but, in practice, in the unique Falklands situation, many of them would have to be drawn upon from the centre – and quickly. Moreover the whole operation would have to be under close political control with the key operational decisions being taken within the MOD – and with the regular advice and support of other government departments. So all of this put the practical RAF aspects in the court of ACAS(Ops) himself.

Even before the Argentine invasion Hayr had been exchanging ideas with his Navy and Army opposite numbers, and on 31 March he introduced 24-hour three-shift manning of the Air Force Operations Room. From then on he, as the continuity man responsible for virtually all RAF decisions in a constantly developing situation, simply worked all the hours he possibly could. His own three air commodores, including John Price, led each of the shifts in turn. As Ken told me afterwards, he felt he really should have had an 'alter ego', an extra air commodore who was fully read into his mind and not working shifts.

Ken remembered also 'the live sense of jointery' among the various MOD staffs, including the civil servants. Such was the urgency of the situation, too, that the procurement procedures were greatly simplified and – of great importance – the customary financial restraints were considerably eased – though confusion did arise, for example, in the delegated engineering authorities when new equipments and modifications were urgently needed and the established channels of authority needed to be by-passed.

A serious problem of a different kind was the supply – or rather virtual absence – of intelligence about the South Atlantic and about the Argentine forces. This was the price of continuing staff cuts and other

economies over the years and it took time to bring in reinforcements of suitable quality and to prepare the necessary assessments and analyses. Consequently in the earlier stages there was some underestimation of the Argentine air capabilities but by the time the Task Force arrived in the South Atlantic a full picture of threats and capabilities had been put together.

Then there was security. Few working in the MOD – or elsewhere – had ever experienced an actual war situation with the risks entailed in planning and mounting 'live' military operations, and Hayr decided to be extremely strict in applying 'need to know'. Some officials, especially in other government departments, felt he was being too secretive and withholding information which they thought was essential for them to do their own jobs, but he remained adamant. He was anxious too about the system for distributing signals; it wasn't easy to ensure that copies of signals on sensitive matters were in fact seen only by the people for whom they were intended. From his experience in CORPORATE he felt too little attention had been devoted to this aspect in the development of the modern signals system.

The overall picture he tried to present to me was that he, as ACAS(Ops), found himself co-ordinating the whole of the RAF's contribution to the Falklands operation. He needed to be in touch directly of course with Sir John Curtiss, AOC 18 Group, and his staff at Northwood. It was he who had been appointed Air Commander for the operation and, as such, he was responsible to CinC Fleet, Admiral Fieldhouse, who commanded the Task Force. His was an obvious appointment, since his Headquarters was located alongside CinC Fleet's own HQ at Northwood, and the RAF and naval staffs there were accustomed to working together and got on well. On the other hand, 18 Group's own resources of aircraft were restricted to those required for its normal maritime role and the Air Commander was going to need many more which would have to be drawn from other parts of the RAF.

Moreover, as the scope for the RAF's commitments expanded, at times in quite unforeseen ways, they needed these resources at once. In many cases there was simply not enough time to go through the normal channels of communication, so Hayr and his staff were in direct and frequent touch with lower formations throughout the Service. This applied not just to aircraft but to a huge range of support equipment and personnel. As one case in point, and there were many more, then Wing

Commander, Squire received much information relating to the build-up of No 1 Sqn from ACAS(Ops) and HQ 18 Group but 'little from his own superior formations, HQ Strike Command and HQ 38 Group'. Hayr certainly appreciated the sensitivities in these matters and took pains to keep the normal authorities in the picture – and particularly SASO at Strike Command – but inevitably there were complaints, and confusion was unavoidable at times.

I think, too, Ken would have reminded us of some of the external matters that also came his way, and particularly the considerable help we needed, and received, from the Americans. Ron Dick will speak later on this but I'll mention here one major subject that became apparent very early on as soon as we realised the critical importance of Wideawake airfield on Ascension Island. This was going to be central to all of the RAF's air operations and especially those depending on air-to-air refuelling, but very little aviation fuel was available on the spot. So, throughout April, difficulty in obtaining adequate quantities by tanker from the USA was a constant, virtually overriding, constraint on the RAF's planning and operations, and it was one of Ken's greatest anxieties. Jeremy Price will probably say more about this.

In concluding, Ken might have repeated one of his closing remarks to me. The way in which the 'system' that was improvised actually worked, he said, was a tribute to the ability of countless individuals to adapt themselves to a very special situation and accept that a great many corners had to be cut.

Although not often mentioned, the VC10s of No 10 Sqn were heavily involved in Op CORPORATE throughout, sustaining the UK-ASI link.

THE ALERT MEASURES COMMITTEE

Air Vice-Marshal John Price

Graduating from Cranwell in 1950, John Price few FGA aircraft in Germany, Korea and Australia later converting to helicopters and commanding squadrons in the Far East and the UK, and latterly the Buccaneer Wing at Laarbruch. Ground tours included stints at the Ministry in every rank from squadron leader to air vice-marshal. His final appointment prior to retirement in 1985 was as ACAS(Ops) since when he has been employed within the oil and gas exploration and production industry.

In the sad absence of Ken Hayr, Henry Probert has given us the best available overview of MOD(AIR)'s involvement in the Falklands war of 1982. Moving down a rung, my task is to recall something of the days at the coalface in Whitehall. I have not consulted the records and must therefore give a health warning that these are my personal recollections, but from a time seared into my memory.

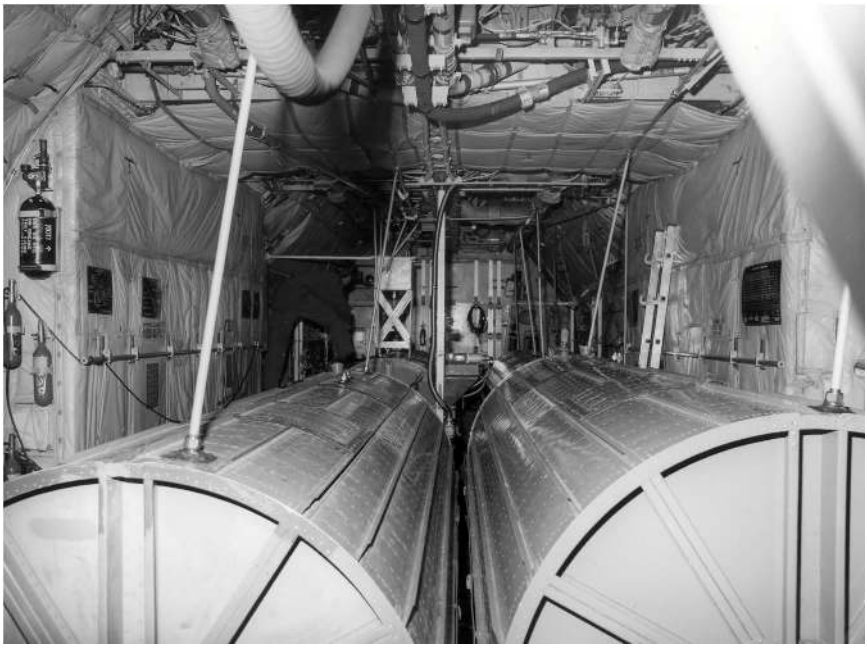
As soon as war seemed likely the Air Force Operations Room (AFOR), for which I was responsible as DofOps(Strike), was brought up to full strength with the addition of officers from all the operational directorates. Experience with many WINTEX exercises had given us familiarity with the process of going to war and for this the RAF's Transition to War (TTW) manual gave us a structured, well thought through, and I think, even with hindsight, logical procedure. So we were not entirely in uncharted territory; although I had to remove 'Exercise, Exercise' from some early signals drafted by people who had not yet got the message. This peacetime syndrome arose on several other occasions and I will give more examples later.

The manual gave a series of Alert Measures covering actions such as declaring states of readiness, enhancing the serviceability and capability of aircraft, preparing weapons and deploying forces. It also included the call up of reserves, but while this was often considered it was not, as I recall, widely implemented in the Royal Air Force. To monitor the progress of implementing these measures the Alert Measures Committee was formed under my chairmanship. We met twice each day, morning and evening, and reported at least once each day through ACAS(Ops) to

CAS. The Committee consisted of representatives from the operational directorates (Strike, Maritime, Air Defence and Air Transport), from ACAS(OR)'s parish, from DSigs(Air), often 'Dusty' Saunders himself, from the engineers and from the suppliers. You will, I am sure, note one significant absentee; there was no financier. Margaret Thatcher in her book, *The Downing Street Years*, recalls that she sought the advice of Harold Macmillan about the composition of the War Cabinet. He said, 'Keep the Treasury out.' She followed that advice. We followed that precedent. The Prime Minister was reported at the time as saying, 'We will not count the cost, but will keep an account of the cost.' We did – sort of. So F6 was not present until our very last meeting when retribution was promised, but Dr Fox was in some difficulty as we had plainly won. Another great advantage enjoyed by the Committee was that it had a clearly defined task and was given the trust and freedom to achieve it. I say that in front of our President, then CAS, and indeed said it to Ken Hayr. A lesson not always remembered today

One of the Committee's major responsibilities, although I cannot recall how it came about, was to authorise Operational Emergency Requirements (OERs) for the fitting of new equipment and the carriage of new weapons to enhance the force's operational capability. This was a most satisfying responsibility. A unique opportunity to get much-wanted weapons and kit into aircrew hands with the minimum of bureaucratic interference and with Boscombe Down's clearance given in days, not years.

I shall not mention all the equipment and weapons involved, but will cover some of the ones that seemed most important then, if not later. The Nimrod was fitted with Carousel navigation equipment for obvious reasons connected with the South Georgia reconnaissance flights. It was also given a flight refuelling capability. Shortage of aircraft refuelling hose meant that ground refuelling hose was used and the routeing of this through the aircraft was a little primitive. A very senior engineer, not on the Committee, told me that he could not guarantee that the hose would last for more than ten thousand refuels and he was concerned about the fire hazard during refuelling. I replied that I should be delighted if the hose lasted that long, and the aircrew would be told not to smoke during refuelling. Crews were very rapidly trained in the art of flight refuelling, days not weeks – after all we have always contended, rightly, that we have the best trained aircrew in the world. Harpoon, an anti-ship missile,



The range capability of the Hercules was increased, initially, as here, by the installation of auxiliary fuel tanks in the hold and, ultimately, by the provision of an AAR capability.

was also fitted to Nimrod, and in a way that the experts had previously said was not feasible.

The Hercules force was also given a refuelling capability in short order, courtesy of Marshalls, and the crews quickly learned the role. The aircraft was also given a tanker capability using, in some cases, pumping equipment and tanks from the museum at the AAR school. I will say nothing about the tactics of Hercules AAR operations – they were character forming!

RAF Harriers were given an air-to-air missile capability with Sidewinders, supplied very quickly by our American allies.

The AAR capability of our Vulcans was reinstated and competence in that role quickly regained. The aircraft was also given an anti-radar missile within a matter of weeks. I do not want to pre-empt Sir John's remarks about BLACK BUCK. But I must mention Mike Burton ('Froggie' to his prep-school chums) who produced the initial navigation

plan to show that the mission was, just, possible. Peacetime thinking then came into play at a meeting I held to determine the effectiveness of 1000 lb bombs against the Port Stanley runway. Ken Hayr had somehow obtained the runway's specification from the British consulting engineers who had built it. I showed these to the man from Farnborough, who had pontificated to us for many years about weapon effectiveness, and asked for his assessment in this particular case. Much to my disgust, to put it no higher, he refused on the grounds that he could not carry out the trials necessary for the formation of his opinion. Whoever did the work – HQ Strike Command? HQ 1 Group? – seemed to have got it right.

A more cheerful event was the discovery, and removal from the VC10 in the Museum at Duxford, of some engines that had quite a lot of life remaining. And at the rate at which the VC10s were flying, we needed every hour of that life. In a wider perspective, we quickly learned that the wartime rates of effort postulated in TSD 784 were rather below the rates we were experiencing.

I am sure that I have overlooked many other capability enhancements. For that I apologise; perhaps they will be mentioned during the discussion periods.

The Committee held its last meeting on the day the war ended. I think it had fulfilled its purpose; but then I would say that, wouldn't I? But the presence of my F6 friends meant that we could no longer work with the dispatch to which we had become accustomed.

Some lessons are there to be learned. The innovative spirit, inventiveness and overall competence of our men and women was fully used. We should never ignore these characteristics. A clear, unambiguous directive, and to be given the trust to achieve it without close supervision, does wonders for morale and performance. The lesson about the prevalence of the peacetime syndrome has, I believe, been learned by the Royal Air Force of today. Money is important, but is not everything. Winning is.

A VIEW FROM THE HQ AT NORTHWOOD I

Air Marshal Sir John Curtiss

Sir John joined the RAF in 1942 and, following wartime operations with Bomber Command, he flew 263 round trips to Berlin during the Airlift. His operational horizons were widened further by experience on night fighters before he commanded Bruggen's strike/attack Phantom Wing. His more senior appointments included those of DOrg, Commandant of the RAF Staff College and AOC 18 Gp, which gave him a NATO 'hat' as COMMAIREASTLANT. He left the Service in 1983 to become a Director and CEO of the SBAC until 1990 since when he has been actively associated with a number of charities.

To say that the command organisation for the Falklands was cobbled together in a very *ad hoc* fashion would be an understatement.

Seen at first as an entirely RN operation, with the first elements of the Task Force sailing within days of the Argentinean invasion, it grew in size and complexity day by day.

Elements of the Navy would have liked it to continue as a RN only operation. They were still smarting from the Nott Defence Review of the previous year and saw this as their redemption. In some ways it was, but John Fieldhouse was a highly intelligent officer and a very 'joint' one, and he had no illusions that all three services would be heavily involved in the campaign to retake the Falklands.

No one had envisaged a UK out-of-NATO-area operation, indeed it had been ruled out by successive Defence White Papers. There were no arrangements for a Joint Force Headquarters, so we had to make do with what we had and make the best of it.

Most of the underground facilities were provided for NATO, COMEASTLANT and CINCCHAN, a major NATO Command. It was rightly decided that we could not use the NATO Briefing Room or any of their accommodation. Fortunately, CinC Fleet had a Fleet briefing room which we used throughout the campaign and both he and I, and his COS, had offices there. As numerous officers were added to the staffs so we became ever more crowded. Tanker specialists, Harrier and transport and logistics advisors all joined my staff for the campaign.

Within days of the decision to launch a Task Force I was appointed Air Commander with responsibility for all RAF aircraft deployed forward in support. I became part of the Command team under Admiral Fieldhouse known at first as the FLAIR (Flag and Air Officers) and later as the FLAIRGO when the Army sent a General to join us when 5 Brigade was added to the ORB and Jeremy Moore went South in the QE2.

I had one personal asset that stood me in good stead for this campaign. During my RAF career of forty years I had served in every operational command and had flown in every aircraft type committed to the war, except for the Harrier; although I made up for that after the operation was over.

The other members of the FLAIR were: Admiral Sir Peter Herbert, Flag Officer Submarines; Admiral Halifax, COS Fleet; Admiral Hammersley, Fleet Engineering Officer; and General Jeremy Moore, Royal Marines. Lieutenant General Trant joined later. When 5 Brigade was added the CinC had land forces of some 10,500 men under command.

The FLAIR met daily to plan the campaign, monitor the progress of the Task Force and decide on what further assets were required. When the Task Force arrived off Ascension we flew down by VC10 to discuss the plan of campaign and the possible landing sites with Sandy Woodward, the Task Force Commander. Before the go ahead for a landing was finally given the FLAIRGO subsequently briefed the Prime Minister and the War Cabinet in Whitehall on our plans for the recovery of the Falklands.

Despite, or perhaps due to, the very crowded accommodation, the Task Force Headquarters worked very well and very harmoniously. After the end of the campaign one of the naval officers in the HQ said that they had drawn great confidence from the sounds of laughter that came from the meetings of the FLAIR just down the corridor. We did not take our task lightly, but John Fieldhouse knew how to mix humour with determination and the attention to detail.

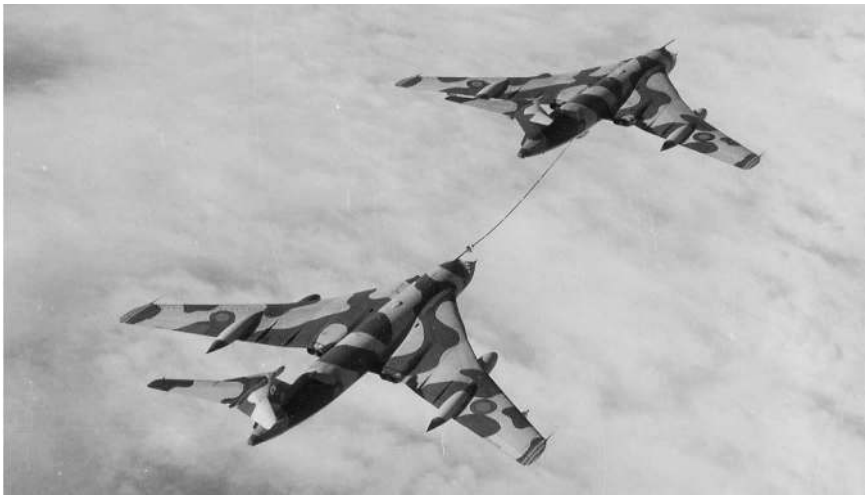
We were subject to numerous visits. The Prime Minister came to three of our evening briefings and sometimes brought members of her War Cabinet. The Duke of Edinburgh and John Nott came separately two or three times and HM The Queen visited the Headquarters and had lunch at Admiralty House.

Once we had won back the Falklands much remained to be done. The main task was to ensure the integrity of the islands and provide protection from any further air attacks. Although the RAF Harriers installed themselves on Port Stanley airfield we needed to replace them with Phantoms and this meant extending the runway.

Within two weeks of the surrender I flew down to Port Stanley with Ian Macfadyen, the CO of No 29 Sqn, which was to be the first Phantom unit to be deployed, to reconnoitre the ground. A month later I took with me a Fighter Control expert, Wg Cdr Bob Daniels, to explore sites for permanent radar installations on the Islands.

On my first visit it was bitterly cold and the islands were covered in snow. It was most encouraging to see the high morale of the RAF personnel, all of whom were still living in tents at that stage.

On my second visit, in October, it was comparatively warm and sunny. Jeremy Moore lent me a Gazelle and I had the opportunity to visit both islands and visit the spots indelibly marked on my memory. San Carlos water, Goose Green, Pebble Island, Mount Kent, Bluff Cove and Stanley itself. I also spent a night on *Illustrious*.



Victor tankers were the key to the conduct of practically all air activities during Operation CORPORATE.

A VIEW FROM THE HQ AT NORTHWOOD II

Air Vice-Marshal George Chesworth

George Chesworth joined the RAF as a National Serviceman in 1948, his first tour being on Sunderlands in the Far East after which he became a QFI and flew Shackletons before ushering in the Nimrod era as OC No 201 Sqn in 1970. He subsequently commanded Kinloss and CTTO; his last appointment was as Chief of Staff at HQ 18 Gp. He was appointed Lord Lieutenant of Moray in 1994.

It did not take long for us to realise that Operation CORPORATE was to be a major undertaking and completely different from anything we had planned and trained for. But it took a relatively long time for the implications of this to sink in and for us to appreciate that we could not go it alone. We would need to reinforce the staff with specialist input from other roles. As there were no contingency plans for large-scale out of area operations – and at this time there was still a possibility of a political settlement – it was necessary to establish what could be done with the existing resources. We knew the capabilities of the various aircraft and of the availability of Ascension, conveniently about halfway to the distant Falklands, 8000 miles from the UK. But apart from the 10,000 ft runway little information was available about other facilities at the airfield and on the island. Gp Capt Jeremy Price will describe these later.

Another difficulty was the absence of any real intelligence on the performance and location of the Argentine fleet, particularly the carrier and the five submarines.

That AAR would be a vital capability if the RAF was to provide support for the Task Force in the South Atlantic was an early appreciation. At Northwood we understood that the installation of a completely new system in the Nimrod, resurrection of the Vulcan system and providing longer legs for the Hercules was a mammoth task. But such was our confidence in the ability of MOD, industry, PE and the Service to achieve such miracles in this war situation that we took for granted the improved capability of the air assets. But all this took time

and meanwhile we had to make do with what we had.

The CinC's first call for air support, after the establishment of the airbridge to Ascension, was for surveillance over the waters through which the various elements of the Task Groups were transiting. This was carried out by Mk 1 Nimrods operating from St Mawgan and Gibraltar. As the Fleet moved further south it was necessary to deploy Nimrod to Ascension. But this deployment was delayed by fuel problems at Ascension.

The, albeit remote, threat to Ascension from Argentine seaborne forces, and/or aircraft, was an early, and constant, concern. A Soviet ELINT vessel was permanently stationed three miles off the runway, and we did not know if it was providing information to the enemy, and Argentinean merchant vessels, which could have been carrying assault personnel, had been detected in adjacent sea areas. Furthermore, and perhaps more significantly, it was judged that, as the Argentine Hercules had an AAR capability, Ascension was a possible target for a limited airborne assault. The DIS discounted any such threat; not a view shared by the CinC and Air Commander, and defensive measures were put in place. The Navy provided a guard ship; Nimrods flew surveillance sorties; a radar from the UK was positioned on the highest point of the island and, pending the arrival of Phantoms, air defence cover was provided by Harriers waiting to deploy south.

After the Task Force left Ascension a small group led by HMS *Antrim* was detached from the main fleet in great secrecy to repossess South Georgia. This group had to be supported beyond the range of the Nimrod and to provide the necessary surveillance Victors, to operate in the MRR role were deployed to Ascension. Supported by AAR Victors these aircraft covered the areas down to South Georgia some 3000 miles from Ascension. The Victor continued in this role until the arrival of the AAR capable, Searchwater radar equipped, Nimrod Mk 2. This radar could detect and classify surface contacts from high level and long range. You will hear more of this later but I believe, with hindsight, that we were expecting too much, too soon, of this newly introduced and very sophisticated equipment.

Following the recapture in late April of South Georgia the Task Force turned its attention to the Falklands. The CinC was concerned that Argentinean fighter/attack aircraft would be able to operate from Stanley and pose a threat to his ships, particularly the carriers. To deny high

Flt Lt Withers, Gp Capt Price and AVM Chesworth hot-debriefing BLACK BUCK I.

performance aircraft the use of the airfield, and counter other threats to naval operations, Victor-supported Vulcan raids commenced on 1 May. Other speakers will cover these later. But I must say that the first BLACK BUCK sortie was a close run thing, due to greater than planned fuel consumption. This was not really surprising as it involved two different types of aircraft operating over distances never attempted before. Not unnaturally, and before the full implications had been appreciated at Northwood, another raid had been requested for the next night. As I was at Ascension, I had to insist that an in-depth analysis of BLACK BUCK I was necessary before a further attack could be contemplated. But the deployment of Vulcans to Ascension, soon to be followed by AAR Nimrods, created planning difficulties at Northwood. Because of a shortage of parking space at Wideawake it was necessary to limit aircraft numbers based there. This dictated that aircraft not required for the immediate ORBAT had to leave the island for Gibraltar, Dakar or even, on occasions, the UK. This meant that tasking priorities had to be established by the CinC two or three days in advance to allow time to

reposition aircraft to fly the required sorties. In effect, as the majority of tasks involved AAR, Admiral Fieldhouse had to decide if he wanted very long range Nimrod surveillance, Vulcan operations or Hercules drops to the ships. It was only much later, when other aircraft were provided with a tanker capability, that this situation was eased. But the numbers of large aircraft parked at Ascension, on occasions, still impacted on operational flexibility.

Looking back, it seems as if things were relatively quiet after the sinking of HMS *Sheffield* on 4 May until 21 May, when the bridgehead was established at San Carlos. But, of course, it was actually very busy. Further Vulcan attacks were mounted on Stanley; Nimrods were now operating in the general area of the Falklands; Hercules dropped spares to the Fleet and two pairs of Harriers transited the 3000 miles from Ascension to the Task Group. Additionally, Harrier attacks and naval shore bombardment were softening up the Argentines.

When the assault and supporting ships were in San Carlos Sound the implications of the Fleet's lack of AEW cover became very obvious. The only prior warning of air attack came from the SSNs operating at periscope depth off the Argentinean coast in the vicinity of their airfields and the picket ships well in advance of the Fleet.

It was very sobering to receive, in almost real time, the news of ships sunk and enemy aircraft shot down by Harriers, land-based and shipborne missiles and gunfire. The ship losses were a great concern to the CinC. Indeed he confided to me later that, had the Argentineans persisted with air strikes after 25 May, the outcome of the campaign might have been very different. But it could have been much worse if the fusing of the bombs dropped by their aircraft had been correct. Many of the bombs went straight through the ships, while others which did not, failed to explode.

The sinking of the *Atlantic Conveyor* with the loss of the Chinooks, their spares, spares for the Harrier and planking for their FOB, was a great blow and affected the RAF contribution to the battle and meant the army would have to walk to Stanley.

Both *Sheffield* and *Atlantic Conveyor* were sunk by Exocet missiles from Super Entendards, a weapon/aircraft combination most feared by the Task Group commanders as the major threat to his carriers. Indeed the Argentines thought they had hit *Hermes* when they struck *Atlantic Conveyor*. We knew the number of Exocets the Argentines had (I think it

was six) and after the two sinkings it was assumed that two were still available. What was not appreciated was the enemy's ability to fire them from the land and HMS *Glamorgan* was badly damaged by a lorry-launched Exocet while engaged on a night gun bombardment of shore facilities.

When the bridgehead was established at San Carlos, and the forces went ashore, there was anxiety at Northwood over the apparent delay in moving the troops out of the base area and advancing to the east of the island. But they did move and with air support, which you will hear about later, defeated the Argentines.

After the Falklands had been recaptured there was still a requirement to support the islands with most of the aircraft from Ascension. In particular the Hercules, supported by AAR Victors and AAR Hercules, transported supplies both before and after the airfield at Stanley was useable.

At Northwood we remained busy until RAF Stanley was up and running with a runway that could be used by aircraft that could deal with any attack the Argentines might be tempted to launch against the Falklands.

At the end of the day we concluded that:

a. Without Victor AAR the RAF would not have been able to support the Task Group all the way to the Falklands.

b. The extraordinary measures taken to provide all long range aircraft with an AAR capability was the key to success.

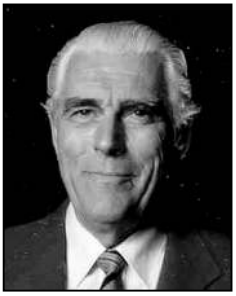
c. Similarly, the rapid provision of armaments to meet new threats enhanced the effectiveness of several aircraft types.

And, finally, that the quality of our people was a major contributor to the success of this operation in a new environment which proved the importance of the flexibility of air power.

From my perspective, twenty-one years later, the Falklands experiences have been well learned and have resulted in today's organisation and equipment. Is it a coincidence that today's PJHQ is at Northwood?

THE VIEW FROM BDLS WASHINGTON

Air Vice-Marshal Ron Dick



Ron Dick graduated from Cranwell in 1952 to fly Meteor F.8s; he subsequently became a QFI and won two aerobatic trophies as such. His subsequent flying career took him, via Vulcans, to command of the Buccaneer Wing at Honington. He retired in 1988 and settled in the USA where he writes and lectures on air power and aeroplanes and, through his association with the warbird movement, has kept his hand in by flying such types as the P-40 and P-51 and, perhaps most significantly, ferrying the RAF Museum's B-17 across the Atlantic.

When the Falklands crisis began in 1982, I was the British Air Attaché in Washington and had been for about eighteen months. In the course of my career, I had also been fortunate enough to have been an exchange officer with the USAF, to have flown in a number of exercises in the US, to have been a guide for the RCDS in North America and to have served on General Haig's staff at SHAPE. My face was therefore fairly familiar to the US military, particularly to many in the Pentagon. Even if that had not been the case, it is true, I think, that US military people are generally comfortable with their British counterparts, if for no other reason than that so many members of the British and American services have suffered together in each other's staff colleges or have enjoyed tours of exchange duty. As I was to find out in 1982, these inter-Service contacts prove their worth time and again in an emergency. There is nothing to equal the sight of a friendly face when you have a problem, unless it is the sound of a well-known voice on the 'phone. This proved to be particularly true at the highest levels of command, when Commanders-in-Chief who were old friends were often able to talk freely and solve difficulties quickly on a transatlantic link.

I was, by early 1982, well settled into an extremely pleasant tour of duty as the friendly RAF spy in the US. The idyll began to fade on 19 March when some Argentinean scrap metal merchants hoisted Argentina's flag on South Georgia. The initial reaction in the US was that the whole thing was too much like a comic opera plot to be taken seriously. However, when it became apparent that the comic opera was

in danger of becoming *Hamlet*, the tempo of exchanges between Washington and London began to quicken. At a political level, the growing crisis was viewed in a very different light on opposite sides of the water. In London, it was quite simple – the Falklands were British territory and British citizens were under threat.

In Washington it was more complex. The Falklands might be British, but they were in the American hemisphere and they carried a whiff of Victorian colonialism about them which made Americans uncomfortable. They were also a bone of contention between two nations friendly to the US, and the last thing Washington wanted was to have a fight taking place between friends on America's doorstep.

When it became apparent first that the Argentineans were not going to back down, and then that their fleet was at sea, the transatlantic messages began to fly, and the atmosphere was not, to start with, entirely harmonious. London wanted the US to lean on its South American friends to stop them doing anything silly. The State Department duly did that through its ambassador in Buenos Aires, but a message also went to the British Foreign Secretary, Lord Carrington, urging caution. Carrington suffered a sense of humour failure and told the US Embassy in London bluntly that an aggressor was loose in the South Atlantic and the US had better make up its mind which side it was on. It was not an auspicious beginning. However, the US ambassador's approach in Buenos Aires had been rebuffed, so President Reagan, urged on by Mrs Thatcher, intervened with a personal 'phone call to General Galtieri on the evening of 31 March. He got nowhere, principally because Galtieri was already being swept along by forces beyond his control. The invasion force had already been committed.

Argentina's soldiers went ashore on East Falkland at dawn on 2 April and then put more ashore on South Georgia. Mrs Thatcher promptly announced to the House of Commons that a task force would be sent to the South Atlantic. There now followed an extraordinary period during which the US seemed to us in the British Embassy to be pursuing two different policies: one public, originating in the State Department, and the other more quietly, in the Pentagon.

Let me briefly run through the public face of Anglo-American relations first, which kept the British Ambassador, Sir Nicholas Henderson, so heavily occupied. It was the principal concern of the State Department that the contenders in the dispute should be kept apart, and

that a negotiated settlement should be reached. The problem was that the opening positions of the parties were uncompromising. The UK said there could be no discussions without a previous Argentinean withdrawal. Argentina said that there could be no withdrawal without a guarantee of Argentinean sovereignty. To break the impasse, Secretary of State Alexander Haig set off on an epic of shuttle diplomacy, flying some 14,000 miles in twelve days as he pursued the Holy Grail of a peaceful solution in London, Buenos Aires and Washington. It was exhausting, exasperating, and, despite quite amazing persistence on his part, he got nowhere. Mrs Thatcher was implacable. The Argentinean forces had to withdraw and the long-term wishes of the Falkland Islanders were paramount. Britain could and would recover the islands by force if it came to it. She still believed that the junta would back down rather than fight. The junta, however, was irrevocably committed. They could not back down and survive. They had also convinced themselves that Britain was a soft-hearted democracy and that the British people had no stomach for a fight. Haig told them flatly, several times, that the British would go through with it and that Argentina would lose. Galtieri told him he was wrong, and Admiral Anaya went so far as to call him a liar.

In the midst of the gathering gloom, there were lighter moments. Haig kept everyone informed about how things were going, and there were times when it was obvious from the messages we were getting in the British Embassy that he was having difficulty in damping down his well-known short fuse. Once he went so far as to say that he might make better progress if he ever got to Galtieri when he was sober. Another time his genuine astonishment at the government in Buenos Aires came out. He said that it was impossible to see how the system worked, since there appeared to be at least a thousand decision makers. He would get Galtieri or Costa Mendes to agree to something, only to have some colonel appear on the scene an hour later and say that it was unacceptable. Faced with the very real tragedy of a comic opera government, Haig finally folded his tent and went home, where he told the President that armed conflict was inevitable and that the US should back Britain. Later, on 30 April, President Reagan imposed sanctions on Argentina and formally offered material aid to the UK, thereby regularising what was already an established fact.

I will leave aside the dissenting voices also being heard by the

President. Jeanne Kirkpatrick was Ambassador to the UN at the time and she believed that the UK was being imperialist and that the US should stand aside. The consequences of backing Britain, she said, would be disastrous for the US, whose long-term interests lay in preserving good relations with Latin America. She was unmoved by arguments which contrasted America's oldest alliance with a convenient arrangement based on promoting anti-Communism in Latin America, or a democratic government with a military dictatorship; nor did she appear to be impressed by the thought that military aggression had taken place in the American hemisphere and that it might perhaps be a good idea for the US to disapprove. She held to her view even after being instructed to vote for a UN resolution demanding the withdrawal of Argentinean forces from the Falklands.

Sir Nicholas Henderson could have been cast in Hollywood as the classically eccentric Englishman. Haig described him as being 'studiously rumpled', and Weinberger said that 'Nicco' (as he was known) 'took great delight in violating many of Saville Row's ideas of proper dress'. The Ambassador was remarkable during the crisis. He hurled himself at it and seemed to be everywhere at once: in the White House; at the State Department; on the Hill; talking to the press; appearing on television. He was on at least one, and usually several, morning news programs almost every day and he was enormously effective in promoting Britain's cause. America heard his aristocratic tones and took one look at his lugubrious face, his uncontrollable hair and his rumpled collar – and loved him. One senator interrupted Nicco in full flood once and told him that his arguments were powerful but that was not why the Senate was with him – it was because he was British. The senator went on to say that he thought it unlikely that the same strong feelings could have been stirred in the US if the South Atlantic confrontation had been between Argentina and Brazil.

Early every morning, the Ambassador's staff, including the defence team, met to brief him before he went on television. For me, in particular, it was a challenging experience. Nicco understood infantry or frigates, but his conception of air power seemed to be frozen in the year 1916. He thought that delivering a bomb on target could surely not be a difficult matter – putting a hole in the Port Stanley runway, for instance. Details like the 4000 miles of open sea between the Ascension base and the target, the multiple refuellings at night, enemy radar and SAMs,

bombing on radar, bomb trajectory, and so on were all mere trifles to him. As far as he was concerned, you picked the target, placed yourself above it, let the bomb go, and the job was done. For Nicco, aircraft *always* found, hit and destroyed their targets. Otherwise, he said, what was the good of them? As a result, I spent a great deal of time briefing the Ambassador on the air war, and then watching his subsequent television appearances with my fingers crossed.

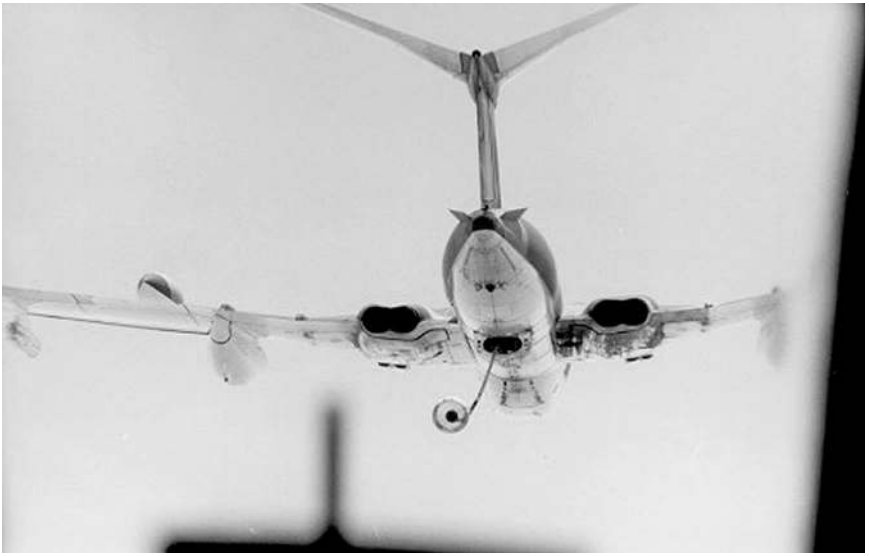
He got his own back on me one day. It was an afternoon in late May and the Ambassador was exhausted by his efforts. The Argentineans at Goose Green had just surrendered and CNN asked him for an interview at 10pm that night. Nicco visibly sagged and said, 'I really don't think I can'. Then he looked across the table at me and said, 'You go'. My protestations about being a simple military man were brushed aside and I was duly despatched to the CNN studios that night. The interview was a cosy little three-way affair, with me in Washington, Herrera Vegas (Argentina's man at the UN) in New York, and the interviewer in Atlanta. The second half of the program was to be in the form of an open 'phones 'call-in'. I was not too happy about facing Herrera Vegas, a smooth, professional diplomat who had been doing well for some time on television. However, the news from Goose Green must have rattled him, because he seemed tense and he made a serious tactical error at an early stage. He said that it was his unpleasant duty to report that the British were killing Argentinean prisoners of war. He claimed they were being used to walk ahead of British soldiers to clear minefields. He went on to say that it was unfair of Americans to accuse only the Galtieri government of human rights abuses when it was well known that Britain was a nation which consistently violated human rights. Once these cracks had appeared in his usually polished composure, his credibility was gone and I was able to hold the moral high ground. That was satisfying, but the 'call-in' left me with a thoroughly warm glow. The calls came in from all over the US and every caller bar one was enthusiastically in support of Britain. I left the studio smiling broadly at every American I saw.

Let me turn to some of the things more obviously in the military sphere. I had, of course, been heavily involved in the crisis since the first day. Mrs Thatcher announced the task force on Saturday, 3 April, and on Monday morning I was on my way to the Pentagon, wearing my best blue and gold ropes and feeling rather stiff and formal. I presented

myself at the entrance to the JCS area trying to look relaxed, but I have to say that I was not brimming with confidence. As I have said, the political signals at this stage were ambivalent, and I was not sure what sort of welcome I would get.

I need not have worried. As I walked the corridors, I was slapped on the back repeatedly and pursued by calls of 'Give 'em Hell down there!' and 'Go Brits!'. (Some months later, my Pentagon friends told me that nearly everyone at the time thought we were insane to launch such a risky operation, and quite a number thought we were going to lose our shirts, but they cheered anyway.) So, encouraged by all that US military enthusiasm, I was ushered into the office of J4(Logistics). The admiral sat me down and asked what he could do for me. I explained that we were going to have to use Ascension as the mounting base for our operations against the Falklands, and that Wideawake, although a US airfield, was on territory leased from the UK. We therefore felt that the US would not object to our increased use of the Wideawake facilities. I pointed out that the fuel storage capacity at Wideawake had been designed to allow for little more than a weekly C-141 or two to service the US satellite tracking station and we were going to need a good deal more than that. I asked if the US would help in providing whatever was necessary.

The admiral said that, of course they wanted to help, and asked how much fuel were we thinking of. I told him that we would like an eight-million gallon tanker full of jet fuel off the settlement of Georgetown within the next seven days. The UK could not provide one, but we hoped the US military could help us out. The admiral pulled the screens back on the big plotting chart on his wall showing the whereabouts of every tanker in which the military had an interest. After some discussion on the telephone, he fingered one of the plots and said they could divert it to do what we wanted. I seem to remember that it was a tanker on its way to Guantanamo. 'How are you going to store and use the fuel?', the admiral wanted to know. I told him that the ship would have to lie off Georgetown with lines ashore and be used as a floating fuel station until empty. 'How long will that take and will you need any more?', was his next question. I said that we would need a similar tanker seven days after the first, and then another in seven more days, and so on. 'You can't use that much fuel!', he said. I assured him we were going to try, and he thereupon set about making long-term plans to meet the requirement.



Operation CORPORATE was critically dependent upon air-to-air refuelling and thus upon (American-supplied) stocks of fuel. This is a Vulcan's eye view of a Victor tanker.

The only snag appeared after three weeks or so, when the admiral told me that the tanker then en route to Ascension had broken a shaft, and was not going to make our deadline. He had found a replacement but it would be at least three days late. It rapidly became apparent that we would be out of fuel before then. Wideawake was up to over 400 aircraft movements per day. I asked him if we could use US stocks then on the island, limited though they were. He agreed, but it was soon obvious that they would be used up too. Confronted with what seemed to be an intractable problem, the admiral produced a chart showing US war stocks at Ascension. The war emergency fuel supply was just enough to fill the gap until the next ship arrived. 'Hell!', he said, 'there *is* a war on, isn't there?' and we got our fuel.

What I did not know when I first visited J4, was that Secretary of Defense Caspar Weinberger had, as soon as he heard about the Argentinean invasion, told his staff that the Brits were to be given every assistance possible short of actually engaging in operations, and that he would not tolerate any bureaucratic interference with British requests, which were to be given maximum possible priority. Given that attitude

from the man at the top, and the normally high level of peacetime co-operation between the US and UK services, it was hardly surprising that the Pentagon was quick to offer support. Indeed, many civilian officials outside the Pentagon later seemed almost alarmed that the military could have pre-empted them in aiding a foreign power. Weinberger had said that the US help must stop short of operations in the war zone. While that was strictly true, in the sense that no US units took part in the Falklands war, it has to be said that the US did provide extra aircraft, ships and men to cover the NATO commitments from which the UK had necessarily withdrawn. That contribution is often forgotten, but it sent an important signal to both friends and enemies that the US was serious about supporting its allies.

There were, of course, many other instances of close Anglo-American co-operation besides the aviation fuel at Ascension. Among the more important were those in the fields of intelligence and communications, and there was an early request for AIM-9L Sidewinders. There was no fuss; our request for immediate delivery was quietly brought up to the top of the priority list as soon as I asked. We also bought navigation systems, like Omega, to cope with very long range over water missions, and other weaponry came in the form of Shrike and Harpoon missiles.

Shrikes fitted to the Vulcan were used against the Argentine's Westinghouse radars near Port Stanley. At about this time, I was drinking for Queen and country at a Washington reception when the local Westinghouse representative drew me aside. 'How are you getting on against their radars?' he wanted to know. 'Do you need any specs or drawings?' I was quite shocked. I asked him if he was not in danger of pushing the limits of ethical behaviour. 'Hell no!' he said. 'You knock that one out and we get to sell them another one.'

At the start of the conflict, the Vulcan was being withdrawn from service. We had just presented three of them to various USAF museums. Led by AVM Mike Knight, they were flown into SAC HQ at Offutt intact and handed over in flying condition. Soon after that we discovered the hard truth that we had no aircraft which were suitable for operations over the vast reaches of the South Atlantic. Hosts of quick fixes were rushed into service to solve these problems, among which was the need to extend the range of our maritime patrol aircraft, the Nimrod. Refuelling probes were needed in a hurry, but they were almost unobtainable. Then someone had an inspiration and we got a call in

Washington. The Vulcans we had just given to the USAF; they had probes on, didn't they? Yes, they did. What followed was very embarrassing. A small team of RAF technicians hurried across the Atlantic. They arrived in civilian clothes and went sneaking around USAF museums, surreptitiously removing the Vulcan probes. At the end of the war, I got a signal from Castle AFB Museum congratulating us on our success and demanding the immediate return of stolen property.

Forgive me if I now digress even further from our central theme and tell you a story which has absolutely nothing to do with Anglo-American relations, but is, I think, worth the telling. In that first week after Mrs T had said the fleet would sail south, I had to go up to the UN to chair a meeting of the United Nations Military Staff Committee – the most moribund committee ever devised by man. Before leaving for New York, I was told that the Buenos Aires newspapers had been headlining a report that a British nuclear submarine had been detected operating off the coast of Argentina. I knew that to be wrong, but it was good news because, if they even *thought* a nuclear submarine was in the offing it was almost as good as having one there. Back in the UN, we dragged ourselves through the motions of our dreary meeting and I then stopped to speak to my French colleague near the conference room door. The Soviet representative that day happened to be an admiral and he brushed my shoulder on his way out. He did not stop or even look at me. He just kept going through the doorway, but a question floated back over his shoulder: 'Are our submarines being of any help?'.

Soviet admirals were not the only ones whose behaviour was perplexing. One particular thorn in our sides for most of the war was Admiral Stansfield Turner, USN retired and ex-CIA, whose daily briefing on morning television we watched with bated breath. The trouble was that he was much too good. His predictions about what the Brits would do next were often too close to the truth for comfort. It was possible to imagine that our opponents were sitting around taking notes. We never managed to think of a way to restrain the phenomenon of the retired military analyst, but it is something that allies need to be aware of.

In the real war, one problem proved to be that of providing aircrew with reasonable living conditions. It soon became obvious that the combination of a vast increase in flying hours and rough living conditions on Ascension (tents on lava next to generators running day

and night) was exacerbating aircrew fatigue and thereby increasing the risk of accidents significantly. I was asked to find some mobile air-conditioned/sound-proofed accommodation, complete with ablutions and kitchens. As it happened, the USAF had just exercised their collapsible 'Concertina City' units in the Middle East and were quite pleased with the results. I knew that the kits were stored at Holloman AFB, New Mexico, and that they had been designed to fit neatly into 'X' number of C-141s.

I presented myself to the USAF Vice-Chief (I think that was General Bob Mathis at the time) and was pointed at a bright young staff colonel for the solution to my problem (Mike Ryan; later the USAF Chief of Staff). Discussion with him revealed that 'Concertina City' came in '500-man modules'. Would that do? I pleaded economies of scale and asked if I could have a third of a module. The problem with that was that the C-141 loads were pre-packaged; the 500-man kitchen might be in the second aircraft. I made an instant decision that we would take a third of a module and whatever that brought.

A couple of telephone calls later, Mike put his hand over the mouthpiece and said, 'You are sure you want these, aren't you? If there is any doubt, speak now, because when I put this 'phone down they're moving!' I told him to go ahead, and then dashed back to the embassy, where I called the MOD in London with the news that the accommodation was on its way. The rear-admiral on the other end at that time was known to be a bit eccentric, and he said, 'Good! But don't bother with the kitchen. If there is one, you must take it out!' I am afraid I told him that he must be grateful for what he got, kitchen or not, but he went on yelling that I must stop it, even though by then it was probably rolling down the runway at Holloman. I subsequently heard that it was a very good kitchen and that the chaps on Ascension were very glad to see it. In fact they were glad to see the whole thing. It was a boon and a blessing.

My largest acquisition came once it was certain that our efforts on the Falklands would be crowned by success. It became apparent that we were going to need to improve Port Stanley airfield substantially once it was captured, so I went to the Pentagon to see J3(Operations), Lt Gen Phillip Gast, USAF, and RAdm Bob Hilton. They were used to my forays by this time, but even they blanched a bit when I said I wanted to buy an airfield. I went into some detail about needing 7000 feet of

runway, a parallel taxiway, a parking apron, arrester gear, and so on. For the first and only time during the war, they hesitated. They explained that the AM2 steel matting they had available was allocated as war stocks and was owned by the Marines. However, it was not long before Bob Hilton gave me an answer. We could have the matting from the Marines' east coast war stocks and they would deliver it to Baltimore for shipping. It subsequently became the new Port Stanley airfield.

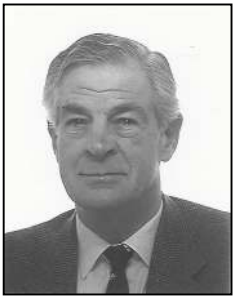
It may seem from all this that the word co-operation does not accurately describe what was happening between the US and the UK. 'One way traffic' might be better. After all, the US provided invaluable help to the UK, but, in doing so, attracted much abuse from Latin America at a time when great efforts had been made to further US interests in that part of the world. So, what, if anything, did the US gain by backing Britain? For one thing, perhaps, the satisfaction of having backed the winner, and, once the dust had settled, the realisation that the power of the Argentinean military junta had been broken and that democracy had been given a chance to take root. But there were other things, too. There were many lessons learned from the war, both on the political and the military fronts, and there was a great deal of mutual debriefing after it was all over to make sure that the benefits were fully shared.

From a personal point of view, I cannot exaggerate how fortunate I was to be in Washington in 1982. Right from the outset, even during the period of public fence-sitting at the White House, I was given nothing but encouragement and help in the Pentagon. Whenever I appeared in front of someone with a problem (nearly all of them pretty demanding) I was welcomed as a friend and, almost invariably, my request was dealt with in front of me on the telephone. I was never asked to sign for anything, nor was I ever asked to put anything in writing. They listened to my story, took my word for it and acted – immediately. Bureaucrats with procedures or objections were brushed aside and told to follow up with the paperwork later – much later. It was all very heart-warming, and a very good time to be an ally of the US.

Note. AVM Dick was not able to attend the seminar in person and his paper was actually delivered on his behalf by AVM Baldwin.

ASCENSION ISLAND – GATEWAY TO THE FALKLANDS

Group Captain Jeremy Price



Jeremy Price graduated from Cranwell in 1959. Initial experience on PR Canberras in Germany was followed by a lengthy involvement in the AAR role, as practitioner, planner and staff officer. Further flying tours on Valiants and Victor Mks 1s and 2s, included command of No 232 OCU, No 57 Sqn and RAF Marham. His final appointment, before taking early retirement in 1987, was as Director of Defence Commitments (UK).

Much has been written about the role of Ascension Island as the forward base supporting British Forces in the South Atlantic and the air operations mounted from Wideawake airfield. However, little attention has been directed to the nature of Ascension Island, the background to the resident community, the facilities that existed when the first deployments arrived, the limited resources available and the measures taken to mitigate shortcomings and develop Wideawake as the operating base for Operation CORPORATE. The missions launched from Ascension are synonymous with air-to-air refuelling and, while the extraordinary air-refuelled long-range air operations hit the headlines, there are but meagre records of the unique challenges faced by both the planners of these operations and the crews flying the multi-aircraft missions.

ASCENSION ISLAND

Ascension Island lies in the South Atlantic at 0755S 1415W, almost midway between the UK and the Falklands. Approximately 34 square miles in area it is a peak rising west of the mid-Atlantic ridge, some 10,000 feet above the ocean floor. The island was thrown up by volcanic activity over thousands of years: it has forty-four major craters and there are a half-dozen extensive lava flows. The most recent eruption was perhaps only 700 years ago. If it were not for its position, Ascension would probably have remained uninhabited.

Discovered by the Portuguese in 1501 it was the Royal Navy who established the first permanent settlement in 1815 when Napoleon was exiled to St Helena. The settlement, now called Georgetown after King

George III, is located on the north west coast. Activities soon extended to Green Mountain which rises 2817 feet above sea level and dominates the island; here a farm was set up near the peak on the only naturally arable land, hence the name Green Mountain. The climate is tropical maritime, pleasantly warm with a prevailing south-easterly wind which can reach 30-35 knots during the day. Cloud forms readily over Green Mountain with, on occasion, heavy, blustery showers developing in the late morning/early afternoon period; the wind and rain, combined with the pervasive volcanic dust, can make for uncomfortable conditions. The anchorage off Georgetown is affected by a heavy, unpredictable swell often rendering the pierhead unusable for up to three days a week.

The beginning of modern Ascension came in WW II when US Army engineers constructed Wideawake Airfield in 1942 as a vital staging post between the United States and the theatres in North Africa and Southern Europe. The wartime US base held as many as 4000 servicemen at one time. The airstrip fell into disuse when troops were withdrawn at the end of the war, but in 1956 an agreement was signed by Britain and the US permitting the use of Ascension as a tracking station for the USAF Eastern Missile Test Range. The airfield was improved and its runway extended to 10,000 feet. A new base was built together with radar and telemetry facilities.

Ten years later NASA introduced a satellite tracking station 1800 feet up at Devil's Ashpit in the south east of the island. In April 1982 the airfield had, in addition to its excellent runway, a large dispersal capable of accommodating twenty-four large fixed-wing aircraft and, on one occasion, thirty-six helicopters. Wideawake was commanded by a Lieutenant Colonel USAF and manned under contract by Pan American Airways (Pan Am) to provide support for up to 285 aircraft movements a year.

The island is administered by a Resident (British) Administrator. At the time of the build up the island existed with two shops, a fourteen-bed hospital, two civilian doctors, a dentist, a padre and sufficient accommodation and an adequate public works capacity to support the population of some 1000, including fifty-eight European families. This population consisted entirely of expatriates; British (FCO administrators, BBC and Cable & Wireless), Americans (USAF, Pan Am and NASA), South Africans working for the South Atlantic Cable Company and a general work force from St Helena. All supplies were either air freighted

in by a weekly USAF C-141 aircraft or shipped in by the small supply ship, RMS *St Helena*, calling bi-monthly during her round trip UK–Ascension–St Helena–South Africa and return. Ascension's limited resources were to come under increasing pressure.

RESOURCES

The number of military personnel that could be absorbed was dictated by some fairly basic constraints: the limited water supply and the capacity to feed and provide suitable accommodation for an unpredictable requirement. The most significant of these was the availability of fresh water.

Water. The island has no natural water supply and the two distillation systems, by-products of the BBC and the USAF base power plants, had limited spare capacity. As the number of military personnel increased so the supply became marginal. The capacity to produce fresh water could support a maximum population of 2800 with reserves for approximately 2½ weeks. Allowing for maintenance and the uneven distribution of water reserves, numbers on the island soon approached the practical limit of the production capacity. For a while water conservation measures were imposed and the maintenance of the distillation plants delayed until production was boosted when reverse osmosis plants were flown in and brought on line. The consequences of a breakdown at either of the distillation plants were a daily concern; fortunately, both units stayed on line throughout Operation CORPORATE.

Accommodation. Suitable accommodation was dictated by the availability of buildings, water supply, sanitation, food and transport. Without evacuating civilians there was sufficient roofed accommodation, all sub-standard, for nearly 700 military. Once all practical buildings had been renovated and the infrastructure improved at various camps, just over 1500 could be accommodated for a short period in overcrowded conditions, mostly in tents. This 'maximum' could be achieved only by accepting standards at severe risk to hygiene and fire safety; for example, the sewage system for the tented camp at 'English Bay' was sized for 100 but supported 400 and the overcrowding at the 'Two Boats' camp resulted in the same problem. In the event, the total of servicemen accommodated, excluding those in transit, peaked just below the 1500 mark. 'Bivvying' was acceptable for many but aircrew, some of whom were flying sorties of between 14 and 28 hour's duration, required

conditions offering undisturbed rest. In the early days, the USAF authorities provided bed spaces for aircrew on the base and allowed a degree of overcrowding which was to cause problems in the medium term. The use of this accommodation could not be guaranteed for, although Pan Am administered the base, other agents, NASA and Military Airlift Command (MAC), owned the accommodation. A 'space event' or increased MAC flights could create demands by these agencies having first call on their buildings. The number of bed spaces could not, therefore, be taken for granted. The very fluid situation was made the more difficult as differing aircrew arrived and departed almost on a daily basis, each wave adjusting beds, furniture and fridges to suit their particular fads; this infuriated the Pan Am accommodation manager and led to problems every few days. The situation improved in late May/early June when the USAF flew in No 4449 Mobile Support Squadron with thirty-two twelve-man modules. In practice it was found that the USAF scales resulted in overcrowding and it was decided that the maximum occupancy should be eight aircrew or one crew if this was less than eight. Thus a potential 384 bed spaces was, in effect, reduced by half. The modules, affectionately know as 'Concertina City', provided all mod cons but the piercing whine of the supporting generators was annoyingly disturbing; the noise problem was reduced with the introduction of extended supply cables and throwing up mounds to deflect the noise. Even so, getting adequate sleep was difficult for many and the drug Temazepam was officially prescribed and accepted enthusiastically; it proved highly effective and made a significant contribution to the success of the long-range air operations from Ascension

Catering. Catering for servicemen was provided by the USAF Mess Hall and three field kitchens, one each at English Bay, Two Boats and the airhead. The in-service catering teams worked marvels and although the provision of storage capacity was sufficient to cater for 1000 men for twenty-one days, on only one occasion were rations reduced to a single day's supply. Early on the menus were restricted to whatever could be created from very basic ingredients but later the field kitchens produced excellent multi-choice meals with fresh vegetables. Throughout, the patient, cheerful St Helenians manning the US commissary produced high standard meals for a significant percentage of the British

servicemen in addition to their normal clientele. The field kitchen equipment proved reliable and robust but the tents deteriorated rapidly in the prevailing conditions and it became clear that, in the longer term, occupation of the sites without adequate sanitation would be hazardous to health.

THE AIRHEAD

I have already mentioned the existence of the 10,000 ft runway and the aircraft parking apron sufficient for twenty-four large fixed-wing aircraft. However, the geography of the airfield and its facilities had a significant impact on the mounting of air operations. In particular the access to the runway, the nature of the surrounding areas, the supply of aviation fuel, the lack of permanent buildings, and the routine needs of our Pan Am hosts had to be taken into account.

Layout. The layout of the airfield provided only one access from the parking apron to the threshold of Runway 14 suitable for the launch of multi-aircraft formations. If the wind direction had required the use of Runway 32 it would have been impossible to launch formations of BLACK BUCK proportions because, to reach the loop at the threshold of Runway 32, aircraft had to taxi along more than two thirds of the runway length. Fortunately the prevailing wind throughout Operation CORPORATE favoured Runway 14.

Surrounding Areas. The pervasive volcanic dust of the surrounding areas dictated the arrangement of aircraft on the apron and the intervals between take-offs on the runway. With the ‘dust’ problem great care was needed to avoid the jet exhaust of one aircraft blowing debris into the intakes of another. The operating areas were swept continually, but even so, taxying power was enough to vacuum debris from the surface into the engine intakes; in a short time the engine compressor blades developed a mirror-like finish. An early priority was the delivery of a ‘Lacre’ sweeper, similar to the sweepers we see on our roads, to supplement the hard pressed Pan Am sweeper vehicle; the ‘Lacre’ was flown to Ascension in an ex-RAF HeavyLift Belfast on 1 May. The two vehicles were worked ceaselessly but it was a case of ‘King Canute attempting to turn back the tide’! The parking apron was made up of both concrete and tarmac surfacing. The tarmac areas soon began to show the adverse effects of fuel spillage causing softening and general degradation. Even partially refuelled Victor aircraft tended to settle into the softened

surface and, to reduce the amount of power needed to get a fully laden stationary aircraft moving, the aircraft were routinely 'tugged' a few feet out of their holes before engine start. It was clear that tarmac surfaces would require attention to maintain the intensity of operations for an extended period but they withstood the wear and tear during the hostilities.

Fuel. The one bulk fuel farm is sited near Georgetown some 5 miles from the airfield. Aviation fuel was supplied by US Sealift Command tankers discharging their cargo through a floating pipeline to the fuel farm. Initially the fuel was then transported by road to 'ready use' tanks on the airfield. The critical link in the supply train was the speed at which fuel bowsers could be filled and driven from Georgetown to Wideawake. Although twelve RAF bowsers were imported to supplement the Pan Am fleet, the bulk fuel farm could dispense fuel to only one bowser at a time and the system was under continual pressure to meet the demand for fuel at the airhead. One unforeseen problem was the very high rate of bowser tyre wear caused by the extremely abrasive surface of the linking road; 3000 miles was a useful life. In late April the fuel supply to the airhead improved when, in a matter of days, the Royal Engineers assembled and commissioned a temporary pipeline from the bulk fuel farm to the 'ready use' tanks at Wideawake where fabric pillow tanks were installed to increase the capacity to 1,000,000 US gallons. Although the pipeline required continuous maintenance and the repeated filling of the pillow tanks accelerated wear and caused leakages, it significantly improved fuel availability at the airfield and reduced the time taken to prepare an aircraft for its next mission. At the end of hostilities, air operations from Ascension had consumed 5½ million US gallons of aviation fuel.

Detachment Support. Permanent buildings were few, the main ones being the 'nose' hangar and the Pan Am ground equipment building. There was no alternative but to accommodate all detachment support under canvas or in inflatable buildings, the latter providing a 'clean', or at least a 'cleaner', environment for the storage and servicing of sensitive equipment. Sunlight, wind and abrasive volcanic dust soon took their toll while exposure to UV radiation degraded material and equipment serviceability.

Pan Am Requirements. With the hectic pace of events it was easy to

overlook the needs of our hosts who went out of their way to assist in any way they could. Their knowledge and experience of managing the airfield proved invaluable and greatly speeded the bedding-in process. The tempo of the build up together with the frequency of helicopter and fixed-wing movements for an airfield manned for only 285 a year caught the residents by surprise. The Pan Am air traffic controllers (there were only two for the first month) did a magnificent job; on one day in late April they recorded over 500 movements making Wideawake one of the busiest, if not the busiest, airfield in the world. Frequent, sometimes hourly, meetings kept relations on an even keel. On an already overcrowded parking apron, the unannounced arrival of a military or civil aircraft caused consternation and a rapid reshuffling of airframes on the parking apron to make room for the new arrival. Special arrangements were needed to cope with a visiting USAF C-5 aircraft; the Victor tankers were jigsawed together in a corner of the pan creating the impression of a junkyard. Our hosts were not at war and, until Alexander Haig's efforts at mediation ceased around 24 April, some practices such as the 'hot refuelling' of helicopters (refuelling with engines running) were prohibited on safety grounds. This restriction slowed the transhipment of personnel and materiel from the airhead to ships of the task force. Once shuttle diplomacy ended we were left to our own devices much to the relief of the helicopter operators.

In summary, with the augmentation of existing facilities and the outstanding co-operation of the resident population, Ascension successfully met the logistic and administrative challenges posed in providing support for the operational forces deployed to the island and in the South Atlantic.

AIR-TO-AIR REFUELLING

Four Victor tankers landed at Wideawake on 18 April and by the following day the number had risen to nine. Initially these were the only immediately available aircraft capable of penetrating the sea areas around South Georgia and the Falklands. Three Maritime Radar Reconnaissance (MRR) missions were flown by the Victors on 19, 22 and 24 April. Once the aircraft reached the task area it had insufficient fuel to complete the reconnaissance and recover to Ascension so it was planned to return via a rendezvous (RV) abeam Rio de Janeiro, positioned to provide a suitable diversion airfield should either the RV or

refuelling fail. For the recovery, a Nimrod was launched from Wideawake to provide assistance for the join-up at the RV. The Nimrod was followed by a wave of four tankers to position two 'topped-up' Victors at the RV, the second as a backup should there be a last minute hitch with the primary tanker's refuelling equipment. This procedure formed the basis for the recovery of all Vulcan and Nimrod missions.

BLACK BUCK I and the subsequent Vulcan missions are well documented, as are the early problems associated with the Vulcan's uncertain fuel consumption, the primary Vulcan's failure to pressurise and the consequences of the broken probe at the final tanker/tanker refuelling, resulting in both Victors flying further south than planned. However little has been written about the plans for these unique operations. The planning for the Victor MRR missions was relatively straightforward compared to the challenge of devising an air-to-air refuelling plan to fly the Vulcan, with its full bomb load, to Port Stanley and then recover it to Ascension. Today, in all probability a computer programme would be used for the intricate calculations but in 1982 the plan was worked, as one of the planners explained with a wry smile, with an electronic pocket calculator bought for £4.95 in Swaffham market! The 'number crunching' for such a complex plan was an achievement in itself and the challenge was then how best to present the mass of information to the aircrew. Although tanker crews were assigned a specific role in the formation, it was critical that every crew had all the necessary information readily available to switch to another position should a tanker become unserviceable for any reason. It was immediately clear that the accepted AAR Brief, presented in a 'book' form, was not practical. The solution was a stroke of brilliance, the 'spaghetti' diagram as it became affectionately known.

The diagram for BLACK BUCK II is reproduced at Figure 1. It presents the mass of information on a single sheet of paper permitting a crew to see exactly what was required at any stage of the mission in any formation position. With hindsight the diagram might appear to be an obvious solution but, at the time, it was a major innovation. In addition to the refuelling plan every crew had to carry a fistful of flight plans and other briefing material; all of which presented a major production problem. An urgent request for a copying machine was sent to RAF Marham, the tanker main base; a local purchase was made and the copying machine was flown to Ascension on the next outbound aircraft.

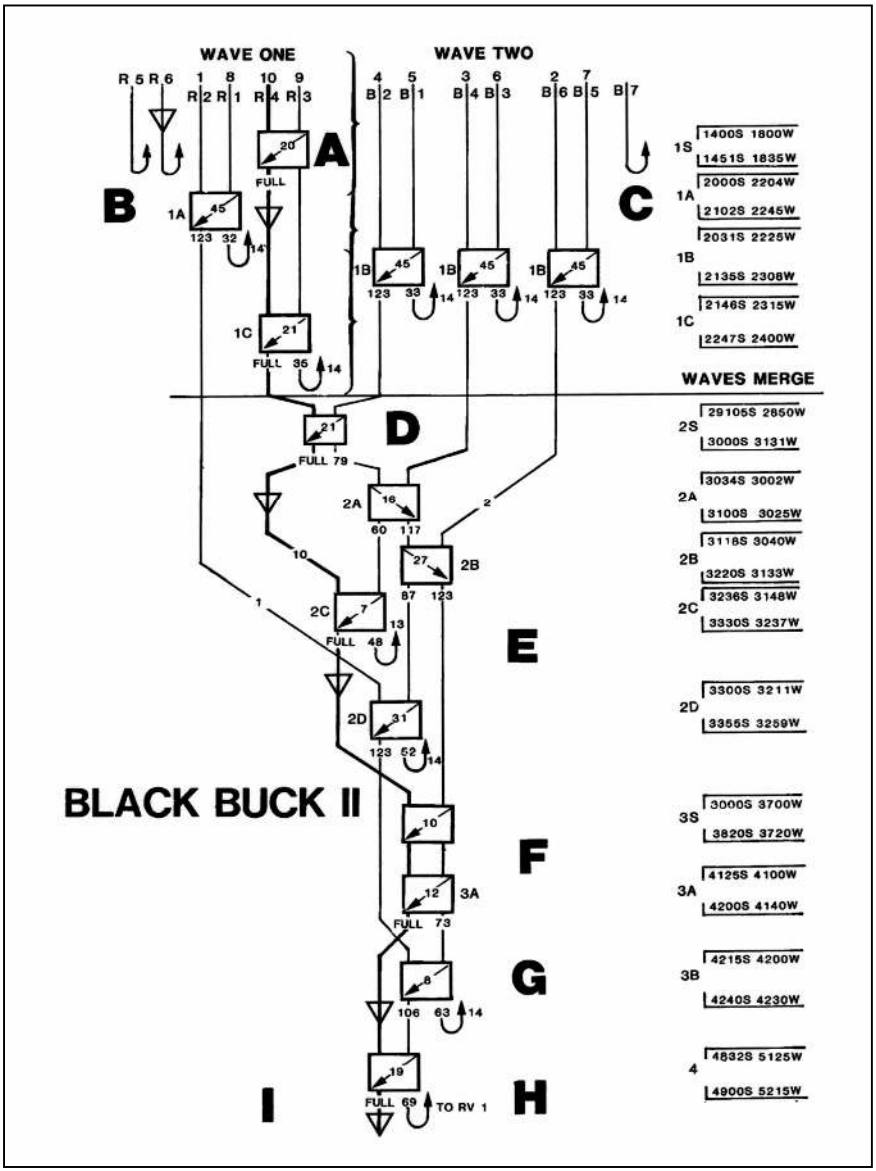


Fig 1. BLACK BUCK II refuelling plan.

Notes on the BLACK BUCK II refuelling plan:

1. The principle is to move optimum quantities of fuel as far as possible down track while matching the tanker's disposable fuel with the void in the receiver's tanks.
2. The latitudes/longitudes on the right-hand side designate the start and finish of each fuel transfer. Transfers 1S, 2S and 3S were amendments incorporated after the experience gained from BLACK BUCK I.
3. The first fuel transfer to the Vulcan (A) was to test the Vulcan's fuel system before the reserve Vulcan and its associated tanker (B) returned to Ascension.
4. The reserve tanker (C) remained with Wave Two until the tanker/tanker transfers at refuel 1B were complete.
5. At (D) there were two refuellings, 1C and 2S. The figure in box 1C shows the tanker transferring 21,000 lbs to the Vulcan. At the end of the transfer the Vulcan is full; the tanker has 35,000 lbs remaining and an estimated 14,000 lbs at the top of descent for the recovery to Ascension. At 2S, the tanker again transfers 21,000 lbs to the Vulcan; the Vulcan is filled to full and the tanker has 79,000 lbs remaining.
6. The small quantities of fuel transferred to the Vulcan and the tanker/tanker transfers at (E) and (F) applied the principle of making maximum use of the available fuel and maintained the Vulcan's ability to recover to Ascension for as long as possible.
7. The final tanker/tanker refuel (G) was planned so that any excess fuel in tanker Blue 6 was passed to the 'long slot' tanker before Blue 6 turned for Ascension.
8. After the final tanker/Vulcan transfer (H) the tanker turned for the RV abeam Rio de Janeiro. The Vulcan (I) continued southwards, descending to low level approximately 300 nautical miles north of Port Stanley.

There was an audible sigh of relief when it arrived at the tanker operations tent.

To say that the Vulcan was refuelled seven times en-route to Port Stanley does not convey the complexity of the task. The outbound formation consisted of eleven Victors, including two airborne reserves (R5 & B7), plus the primary Vulcan (R4) and its airborne reserve (R6). At 2300 hours, in radio silence, the aircraft took off at one minute intervals, the last aircraft leaving the runway 12 minutes after the first.

At cruising altitude this represented a separation of some 85 nautical miles. In the early planning stages the planners envisaged a racetrack at the top of climb to allow later aircraft to join up but it was soon clear that such a procedure consumed too much fuel and the idea was discarded. After much pencil sucking, the formation was split into two waves. Initially the two waves proceeded as independent elements, each element joining up through speed adjustment by the lead aircraft. To enable the second wave to catch up it was planned to fly 4000 feet higher than the first wave, giving it a higher true airspeed while flying at the most economical indicated airspeed. Air-to-air TACAN range equipment between the lead aircraft of each wave provided an indication of the closing rate. The remnants of the two waves merged some two hours south of Ascension.

After the attack the Vulcan returned to Ascension via the Rio RV, the route planned to be outside mainland radar range. Two waves of three tankers separated by l½ hours, together with a supporting Nimrod, were launched to the Rio RV to meet the returning long-slot tanker and the Vulcan. For BLACK BUCK I the Vulcan was airborne for 16 hours 2 minutes, the long slot tanker for 14 hours 5 minutes while the total Victor flight time was 105 hours 25 minutes. The outbound plus the inbound waves of Victors uplifted 1,955,000 lbs of fuel, that is 244,000 imperial gallons. The Vulcan received 7% of the total and 20% was transferred between the Victors. At the final outbound transfer the fuel passed to the Vulcan had passed through five different tankers.

The distances covered during Operation CORPORATE proved the value of air refuelling as a force extender; throughout records were being set and broken. Supported by Victor tankers, the Vulcans, the modified Nimrods and Hercules, the Harriers, Sea Harriers and Phantoms all flew further than at any time in their operational life. The flexibility of air power was demonstrated in abundance by planners, engineers, suppliers and, of course, by the aircrew.

RAF LYNEHAM AND THE AIR BRIDGE

Air Vice-Marshal Clive Evans

Clive Evans joined the RAF in 1955. His very varied flying career embraced Hunters, Chipmunks, Vampires, Canberras, Lightnings, F-111s and the Hercules, the latter as OC No 24 Sqn and later as Station Commander at Lyenham. Along the way he became a QFI, QWI and IRE, served as the first MRCA Project Officer at Munich, was the first Head of the RAF Presentation Team and spent most of 1985 as Deputy Commander of British Forces Falkland Islands. Before retiring in 1992, he was Deputy Air Secretary and then Deputy Commandant of the RCDS.

In early April I was called to the scrambler telephone in operations at RAF Lyneham where I was Station Commander and informed by my Senior Air Staff Officer at Group that a consignment of ex-Andover auxiliary fuel tanks were on their way to my station and that my engineers were immediately to start plumbing them in to some of my aircraft. The reason for this was that the Hercules of RAF Lyneham were by then engaged in a massive airlift in support of the Task Force to the South Atlantic but were limited by their range of 3000 miles, and the Andover tanks were a stopgap measure to increase their range. But why was the Hercules normal range capability inadequate?

As you have heard from Jeremy, Ascension Island was vital to our operation but, at 4000 miles from the UK and 3500 miles from the Falklands, the standard Hercules could not cope with the distances involved. We handled the UK to Ascension leg by receiving welcome co-operation from Senegal who allowed us to use their major airfield at Dakar as a staging post, with accommodation being provided for our slip crews and engineers. We also used Gibraltar on occasion as an extra staging airfield for some very heavy loads. This arrangement enabled us to carry loads as far as Ascension and I will come back to the use of the Andover tanks in a minute.

The first surface ships sailed from Portsmouth on 5 April but by then I was sending eight aircraft a day down to Dakar and thence to Ascension. Although all the aircraft carried loads which would be vital for the Task Force when it arrived at Ascension, on my early aircraft I

sent engineering and support personnel which would be essential if I was to establish a routine flow of aircraft through the island; I also sent a number of Flight Commanders to ensure that everything was properly organised and that my personnel were decently accommodated and fed. By cancelling a range of non-Operation CORPORATE tasks and pouring in a huge amount of unplanned engineering effort the number of Hercules available for CORPORATE increased markedly and within about a week there was a continuous stream of Hercules being launched from Lyneham at a rate of one every 45 minutes.

These aircraft would stage down to Dakar where they would take on a fresh crew and enough fuel to fly on down to Ascension and back to Dakar without using any of the precious reserves on the island; another crew would then bring the aircraft back to Lyneham. Our loads were all high priority items, weapons, missiles, medical kit, spares and the like, that there had just not been enough time to send off with the ships on 5 April.

It soon became very obvious that, once the Task Force sailed south from Ascension Island, the only way of delivering urgent/vital supplies would be through my Hercules flying down to it and dropping them by parachute into the sea, having provided sufficient flotation packaging to permit the stores to float until picked up by the ships. The vital work of packaging the items and working out the extraction method was done by the Army's 47 Air Despatch Sqn, one of Lyneham's resident units.

The air drop technique always worked very well but there was one amusing incident when the small pinnace sent to drag the large load alongside a destroyer for pick up, took over three hours to do the job. A killer whale had fallen in love with what we had dropped and it chased off the naval boat every time it tried to get near it. It eventually took the destroyer itself to chase off the amorous orca and recover the load.

But now we come back to those Andover tanks. With the Hercules having a range of 3000 miles it was obvious that once the Task Force was more than 1500 miles south of Ascension we could no longer reach them, so Group came up with two ideas.

Option One involved increasing the fuel capacity of the aircraft by using surplus auxiliary fuel tanks which had originally been acquired for the Andover. Installed in the freight bay and plumbed into the aircraft's fuel system, each of these tanks had a capacity of 825 gallons so a pair would supplement the Hercules' normal fuel of 63,000 lbs by a further

13 200 lbs, giving it an extra four hour's flying. We also devised a four-tank scheme. The penalty for fitting any of these tanks, of course, was a corresponding reduction in the payload and the four-tank option effectively took up some three-quarters of our normal capacity. Nevertheless, the remaining space would still be of vital use if we were required to make high priority drops at extreme range. A good example of this sort of load might be a group of SAS men who, while having a very high value, would take up relatively little room. My engineers started work on the Hercules conversion at Lyneham and we did everything on base with the first long range aircraft going to Ascension on 4 May.

The second, and far more radical, idea was to provide the Hercules with an air-to-air refuelling capability, the aim being to give my force the ability to carry a full load all the way down to the Task Force when it was operating off the Falklands, drop it and then return to Ascension Island. The engineering firm of Marshalls of Cambridge started working on this on 15 April. The company was no stranger to the C-130, of course, as it was Lockheed's authorised UK service centre for the aircraft and they had been supporting the RAF's Hercules since 1975. In crude terms, the modification involved fitting a probe above the aircraft cabin with suitable piping running from it to deliver the fuel to the main tanks in the wings. Apart from providing the ability to take on fuel, it was also clear that, if we installed a hose drum unit on the rear ramp of those aircraft that had already been fitted with the Andover tanks, we could also operate the aircraft in the tanker role.

Marshalls completed the prototype installation in just ten days, the first flight being made on 28 April. The first 'probed' Hercules was delivered to Boscombe Down the next day. It made its first 'wet' coupling with a Victor tanker on 2 May and I received it at Lyneham on 5 May.

Because I had been a fighter pilot earlier in my career and had had some practical experience of air-to-air refuelling, I was probably uniquely placed to oversee the introduction of this technique. After all, transport pilots tend to spend most of their time trying to keep their aeroplanes as far away as possible from other people's aeroplanes, so AAR was going to require a different mindset. I was in the fortunate position of being personally able to devise the very short programme needed to teach my crews to fly the Hercules in close formation and then

to learn how to refuel in the air. I was so lucky to have the son of Bill Bedford, the test pilot, as the Flight Commander of my training squadron, as (just like his father) he has the most marvellous flying skills and he did all the conversions for me, only four trips per crew being allowed before they were sent south to Ascension to do it for real over the South Atlantic.

We did encounter some problems because we did not receive our first Hercules tanker until after the war had ended, so all of the early refuelling had to be done from Victors and Vulcans. The discrepancy between the speeds of the aircraft means that you cannot really do it in level flight because, at operational weights, the Victor (the Vulcans were only involved in UK-based training sorties) can't go slow enough and the Herc can't go fast enough. In the end we developed a technique which involved fuel being transferred in a gentle dive starting at about 20,000 feet. That way, the Victor could manage to keep down to 230 knots and (thanks to Isaac Newton) the poor old Herc could bump up its normal 210 knots to match this. This procedure meant a prolonged descent at 500 feet per minute, the exercise usually being completed about 5000 feet above the ocean, before commencing the long haul back up to altitude. That said, depending on the conditions, it could be a lot lower!

A typical mission would require three tankers to get a Hercules all the way down to the Falklands and back (not counting any involved in mutual Victor-Victor transfers). The Herc would be overtaken by the first Victor and refuel from it about 1500 miles south of Ascension. The second Victor would catch up with the Herc after another 1500 miles and just short of its descent to the Task Force, that tanker having to be refuelled itself on the way back. Once down to about 1000 feet the Hercules would depressurise, open its ramp, drop the stores to the ships, close the ramp, repressurise, climb back up to cruising altitude before making a rendezvous with its third tanker halfway home. Each of these flights would take a minimum of 25 hours but one crew, commanded by Flt Lt Terry Locke, set a world record for the Herc on 18/19 June when the sortie lasted 28 hours and 3 minutes! – which puts our annual holiday flight to Malaga into perspective, doesn't it?

I should, perhaps, expand further on these very long flights because they really did push my crews to the limit. Sustaining the Task Force required a daily flight but I had very few crews who were trained to air

drop stores and were also air-to-air refuelling qualified. Remember, I had none to start with and was desperately trying to convert as many as I could as quickly as I could.

With the small numbers available to me, this meant that I had to get each of them to do six trips in a twenty-day period. The maximum flying time allowed by law for a pilot is 120 hours per month and I was asking them to do *at least* 150 hours in just twenty days, not far short of double the normal maximum rate – and in a combat zone. You can see the problem and, as you have heard from Jeremy, we were obliged to prescribe the non-addictive drug Temazepam for all of my crews to ensure that they did get some proper rest between flights. I made a particular point of interviewing each captain and crew on their return to Lyneham to reassure myself that they were fit to undertake this sort of high intensity operation. Without exception I found them to be absolutely drained, but determined and confident in their ability to undertake the task. The one thing that I could do to help take some of the pressure off them was to add an extra captain and navigator to each crew to do the operating between refuellings. Without this I am not sure that they could have managed. We also fitted the Hercules involved in the very long flights with locally purchased inertial navigation systems, which we located in the forward end of the freight bay.

The airlift turned out to be the biggest since the Berlin Airlift of 1948-49. The Hercules carried over 7000 tons, or 15 million pounds, of freight, including 114 vehicles, twenty-two helicopters and nearly 6000 troops and support personnel. We did all of this with very little reinforcement in terms of manpower (although I did claim back some aircrew that had recently left the station and were thus still current). As an example of the effort put in, my engineers worked 54,000 man hours over and above their planned duty time during the period of the conflict.

I can best illustrate the extent of Lyneham's achievement by noting the hours actually flown, compared to our normal peacetime task, which was 2800 hours per month. In April we stepped that up to 5000 hours; in May it was 7000 hours and in June we flew 6000 hours. And all of that without any substantial reinforcement of personnel while still being required to satisfy any number of MOD-sponsored tasks that were unconnected with the Falklands War. Many, of the latter, may I say, were levied despite my protestations as the Station Commander.

Station Commanders were normally limited to 10 hours flying per

month but my log book reveals that I did 20 hours in April, 40 in May and 50 in June because we had to use everyone who could be made available to keep aircraft moving down that lifeline to the South Atlantic. Furthermore, I needed to have first hand experience of the problems my crews were encountering in flying the missions and I needed to maintain personal contact with my crews who were based in Ascension Island.

In closing, I will highlight just two notable incidents. The first was the first long range flight into the combat zone which took place on 16 May when Flt Lt Harry Burgoyne dropped 1000 lbs of vital stores and eight SAS troopers into the sea alongside HMS *Antelope*.

The second was the aftermath of the death of H Jones who was killed at Goose Green. Maj Chris Keeble took over 2 Para, led them to victory and accepted the surrender of the Argentineans at Goose Green. One might well have expected him to be given acting rank and continue in command but it was decided that 2 Para should have a new CO and we were told to lay on one of our special long range Hercs to deliver him on 1 June. We did this by flying down to arrive after dark, using the aircraft's weather radar to help position the aircraft at low level so that he could parachute into the sea to be picked up and moved forward to his battalion. It was a complicated and dangerous mission, right into the heart of the combat zone, but you would never guess it from the laconic way in which the literature on the war recounts the incident. Most accounts usually just note that 'Lt Col David Chandler arrived to take over command of 2 Para from Chris Keeble.'

Something of an understatement, I am sure you would agree. But, all in a day's work for the RAF.

An Ascension-Falklands air link was established as soon as the islands had been retaken. This is the first Hercules taking off on its return flight.

NIMROD OPERATIONS AT ASCENSION ISLAND

Group Captain David Pierce

David Pierce joined the RAF in 1957. Trained as an AEO, he flew Shackletons with Nos 120, 206 and 201 Sqns before helping to introduce the Nimrod era by setting up the Maritime Acoustic Analysis Unit at Kinloss in 1969. Subsequent tours included two Nimrod flying appointments, a stint with the RCAF on the Argus and on the Air Attaché's staff in Washington. He left the Service, as SRAFO Plymouth, in 1992 and he currently works as a CAB volunteer in Scotland.

In April 1982, I was OC Ops Support Squadron at Kinloss, a post sometimes referred to as the 'Prince of Darkness', and we had just come to the end of eight week's continuous covert operations against some Soviet nuclear submarines operating in the north-east Atlantic. So on 1 April, you could say we in Ops were already like coiled springs, but we were badly in need of some lubrication.

I arrived at Ascension in early May to run the Nimrod Support Cell courtesy of the second MR2 with a refuelling capability. With the fuel pipe leading from a hatch in the cockpit, down along the fuselage floor and disappearing somewhere in the bomb bay area, the installation certainly deserved its description of being 'robust but inelegant'. But it worked, and it was a credit to the team that put the idea into practice in such a short time.

I had a small team of two flight lieutenant air controllers who looked after the briefings and two airmen aircrew (MAEOps/SNCOs) who dealt with intelligence, EW and crew debriefs. There had been a constant turnover of staff in the Support Cell during the first month and my first decision was to stay for at least two months myself and for the rest to stay at least four weeks before changeover. This brought some immediate continuity of experience and helped to improve liaison with Victor Ops and main Ops at Nose Hangar.

A little later we were augmented by a flight lieutenant Nimrod navigator, Tony Thomas, who brought some much needed Nimrod flight planning experience to Tanker Ops and he did wonders to smooth the inevitable problems that cropped up as we of the kipper fleet adjusted to

the new skills involved in tanking procedures and operations. We operated out of the small US Navy Tactical Support Cell where we could just manage to brief and debrief the crew captain, navigator and AEO. It was with some measure of envy that we used to call on Victor Ops in their large, hot, dusty tented accommodation and then go back to work in Nimrod Ops and squeeze into our cramped 'air-conditioned' office.

Northwood issued broad tasking on a daily basis and we translated these instructions into two 'Form Green' sorties; the main one covering the rapidly extending sea lines of communication (SLOCS) towards the Falklands, and the second, surveillance around the island. Signal traffic was dealt with by Tactical Communications Wing (TCW) and they also provide air/ground communications during Nimrod operations to the south. ASMA, when it arrived, was of immense help since it permitted us to augment TCW communications with HQ while providing a continuous secure communications link with Northwood Ops and Kinloss. For engineers and operators alike, this was a particularly powerful tool and a great leap forward for the Nimrod force operating away from home base in the early 1980s; a fact which is perhaps not so readily apparent today when most of us possess PCs, email and mobile phones. For example, ASMA gave us in Ops the ability to download frequency prediction charts and improve our Nimrod-to-ground communications by determining the best frequencies for the longer range sorties towards the Falklands.

Post flight reports were by Form Purple and this involved a rapid change of gear compared to our routine peacetime reporting to HQ. The Air Commander was, rightly, not too pleased with the quality and content of the early reports. We needed to improve our interpretation of, not only what the returning crews told us, but what the Air Commander wanted to know about what was happening on the ocean, even if it was negative information. After some not too gentle persuasion, we were able to get the intelligence team to understand that they needed to *debrief* a crew and not just accept its first report. If the radar operator thought he had detected a naval vessel, we wanted *his* assessment of the contact and not just the sanitised interpretation by the crew execs. The new Searchwater radar was of immense help here but a little more of that later.

Rules of Engagement (ROE) came as a bit of a surprise; none of us had any previous experience of this kind of constraint and as each new

batch was issued to cover the developing situation further south, we soon developed quite a legal turn of mind to make sure we were following the Commander's intentions. One lesson that came out loud and clear was that ROEs needed to be exercised down to station, squadron and crew level in future exercises.

We had an ever-present Soviet AGI off the island, a *Primorye* I think, with a large white superstructure housing all its aerials. We had one robust antipodean Chinook pilot who used to visit us regularly in Nimrod Ops and he offered to fly out in his helicopter to donate a bottle of malt to the Russian captain and then perhaps inadvertently 'blast the superstructure and aerial to blazes' with his downwash.

But let me tell you a little about some of the Nimrod sensors. The Mark 1 eyeball was as important as ever, just as it had been in WW II. Crews immediately had reservations about the performance of the standard trusted binoculars of the previous twenty years when there was a risk of getting too close to a vessel for the first stab at visual identification. In early April, we made a local purchase of the six best binoculars we could find between Elgin and Inverness and they were soon performing well out of Ascension. However, this improved performance brought its own problems with aircraft vibration interfering with the enhanced image. Help was at hand with the arrival of 'the egg', courtesy of the US Navy. 'The egg' was a small gyro unit which could be clamped to the binoculars to damp out the aircraft vibration. The stabilised vision brought an immediate improvement in performance. There was a small residual problem however, particularly in the cockpit, as too rapid scanning across the horizon brought a counteraction from the gyro and the pilot's head had a tendency to precess anti-clockwise, and, of course, clockwise when south of the equator.

A Nimrod sighting of an Argentinean Boeing 707 searching the SLOCS for our Task Force provided the impetus for fitting Sidewinders. One of the spin-offs was a cartoon of a very happy looking Nimrod with two clockwork keys fitted either side of the fuselage (Side-winder…?). There was also the mischievous thought that a Nimrod attacking a Boeing 707 could have been de Havilland's ultimate revenge held over from the Comet's fatigue problems in the 1950s.

The Searchwater worked well, even though it was a new sensor to the radar operators. It gave consistent security of search out to 150 nms either side of track , something the old 1960s ASV-21 radar of Nimrod

A Nimrod at Ascension Island.

Mk 1 and Shackleton days simply could not do. Equally important, with its improved pulse-width and contact processing, it allowed crews to make a good assessment of the size and type of radar contact, permitting the operator to classify a contact as, for instance, a probable fishing vessel or small coaster.

Warships tend to have a characteristic signature which distinguishes them from merchant traffic. Being able to make a threat assessment of

each contact in the 100 plus which might be detected during a patrol was a powerful capability, especially if you could report that there was only one possible hostile, or even no hostile vessels, amongst all the contacts detected during a 15-18 hour flight. If a contact was deemed to be potentially hostile, perhaps because of where it was operating, Searchwater permitted the crew to make a good stab at classifying the return as naval or non-naval without having to penetrate the target's missile engagement zone. All of this represented a considerable improvement in the Nimrod's ability to conduct long range surveillance over a large areas, even when it produced only negative intelligence.

Not so well known was the fact that infra-red linescan was tried briefly, fitted in the starboard beam. Quite a good performance was achieved in trials held at Kinloss during April and the equipment was tried once in anger from ASI. One of the daytime island surveillance sorties found an Argentinean bulk freighter with a projected track passing close to ASI during the night hours. One of our chief techs performed wonders fitting the equipment (there was only one set) in short order for a night sortie to check that the vessel kept well away from ASI. Sadly I have to report that the infra-red did not perform well on that sortie and it was never tried out again.

Crew accommodation at Ascension changed in June with the arrival of 'Concertina City', courtesy of several USAF C-141 Starlifters. The naval party at ASI thought a nautical touch would raise the tone and they christened the cabins with such august names as *Jellicoe*, *Fisher* and *Hornblower*. Needless to say, they were thwarted by our bold aircrews who preferred *Pugwash*, *Bird's Eye* and *Long John Silver*. American engineers erected the cabins in typically efficient style but when queried about sewage disposal at one of the main briefings a grizzled Seabee commented somewhat curtly that he was not going to be responsible for any British 'S-H-One-T'.

It had been a challenging time; the Nimrod had gained several improvements, especially to its weapons suite, and we had all learned a lot, particularly about ourselves. I left Ascension on 4 July, about three weeks after the white flag was raised over Port Stanley. We saw *Canberra* passing through, covered in rust and full of Royal Marines, some of the real heroes. Station Routine Order No 1 came out that day. Things would never have been the same; it was a good time to leave.

MORNING DISCUSSION PERIOD

Cdre Toby Elliott. Before I ask my question, as I am, I believe, the only RN member of the RAF Historical Society, perhaps I can offer a naval perspective. I was Captain of HMS *Resolution* at the time; we had just gone on QRA, for what was expected to be a standard 72-day deterrent patrol, when I was awoken by the Officer of the Watch to say that the Falkland Islands had been invaded by the Argentineans. I switched on my radio in time to catch the World Service news bulletin. This confirmed that the Falklands had been invaded but reassured us that it was alright, because the first British submarine, HMS *Resolution*, was already off Buenos Aires with its missiles trained (*Laughter*) – which came as something of a surprise, I can tell you!

I was very taken by Ron Dick's lovely story about the Soviet admiral enquiring as to whether the Russian submarines were being of any help, but I doubt that he will have been referring to the dozen or so Russian submarines that were out beating up the Norwegian Sea and the North Atlantic looking for HMS *Resolution*.

But, to my question. I just wondered whether, when Sir John Fieldhouse was being briefed on the amazing efforts required to get one bomb over the airfield, he ever asked whether it might not be a good idea to go back to aircraft carriers?

Sir John Curtiss. No he didn't! (*Laughter*) He was a submariner of course!

AVM George Chesworth. I would just add that Sandy Woodward thought it was a tremendously good idea that the Vulcans went down.

Air Cdre Max Bacon. Perhaps I could offer an observation. Even if we had had conventional aircraft carriers with fixed-wing aeroplanes, I doubt that they would have been able to operate as effectively as the Harriers did because of the rough weather conditions in the South Atlantic. V/STOL aircraft could continue to take off and land with a pitching deck and wind strengths which would probably have precluded operations by fixed-wing aircraft, so conventional carriers probably wouldn't have been the answer.

Mike Meech. Mention was made of Ships Taken Up From Trade, but I believe that we were also obliged to hire civilian aircraft to assist with the deployment, some of these being ex-RAF Belfasts. Were there any

In seaborne operations, V/STOL aircraft may be more tolerant of adverse weather conditions than conventional types. These Harriers of No 1 Sqn are preparing to launch from HMS Hermes.

regrets within the MOD over the earlier decision to dispense with the Belfast?

Air Chf Mshl Sir 'Jock' Kennedy. I was Director of Ops (Air Support) in the MOD when those aircraft were withdrawn. There was a hairbrained scheme which involved our getting rid of three or four Belfasts, half-a-dozen Britannias and two or three VC10s. It made no sense whatsoever; the whole thing was driven by finance, of course. I remember submitting a vigorous appeal, on the grounds that we needed a heavy-lifter and one that could take outsize loads and that, while the Belfast's performance might be somewhat lacking, it could certainly do the job. I'm afraid that it got no further than about the 2-star level and the case was turned down flat.

But, perhaps I could ask a question. John Fieldhouse was a very good friend of mine, and he was convinced that the bomb that was placed on the runway at Stanley didn't really achieve very much at all. Did it? Was there, as has been suggested elsewhere, an artificial bomb crater that was created overnight as a decoy? I have been told that the Argentineans

were flying from Stanley within 24 hours of the first attack and that they continued to operate from there throughout the campaign.

Sir John Curtiss. I think that that point will be adequately addressed during this afternoon's presentations, so perhaps we could leave it until then.

Unidentified. Was the British government expecting a landing in the Falklands, or did it really come as a surprise?

Sir John Curtiss. Did we expect the Argentineans to invade? No, I don't think that we did, but some would say that the Foreign Office was almost desperate to get rid of the Falklands and didn't really care. They were about to withdraw *Endurance* and every other signal that they sent to the Argentineans indicated that the British weren't terribly interested. I am pretty certain that General Galtieri and his team thought they would have a walkover. I think that they anticipated a lot of diplomatic activity but that the whole thing would quietly die away and the Falklands would be theirs. I am sure that that would have been their appreciation of the situation and our Foreign Office had clearly done nothing to disabuse them of that idea.

AVM David Niven. I was a squadron leader at the time and the Air Adviser to Peter de la Billiere, the Director of the Special Air Service. I don't have a question, but I would like to make a point, to do with operational security. We have heard that Sir Kenneth Hayr kept everything pretty close to his chest and exercised the 'need to know' principle rigidly, and I can assure you that Peter de la Billiere did exactly the same. As a result, I came into conflict with Sir Kenneth on a number of occasions over the 'need to know' principle. I always felt that whenever I approached Sir Kenneth, or others, asking for resources, I always got them but that it was always at the expense of some other operation. If we had shared some information, particularly between the Special Air Service and Sir Kenneth, we might have avoided interfering with other plans which were equally essential to the campaign. The rider to this is that Sir Kenneth and I discussed this after the Falklands campaign and I know that he applied the lessons learned when it came to the Gulf War in 1991 and he was DCDS(C).

VULCAN OPERATIONS

Air Marshal Sir John Curtiss

For a biographical note, see page 17

I am going to talk about BLACK BUCK operations, although it is not my intention to go into the minute detail of the Vulcan attacks against Port Stanley airport, as I think that you will have gained a very good appreciation of the complexities of the in-flight refuelling required from this morning's excellent talk by Jeremy Price. I would also draw your attention to Jeff Jefford's paper in Journal 20 which provided an overview of the Vulcan's participation in the campaign.

My aims are to set out why it was decided to mount these operations, what this involved and what was achieved. The objective was most certainly not, as has been suggested by some, merely to satisfy the RAF's desire to get in on the act. Quite plainly, we were already very much in on the act in any case. The greatest concerns of the command team at Northwood was the Task Force's vulnerability to air attack and the possible attrition rate of the Sea Harriers, not only from enemy action, but due to weather and the other hazards of operating in the South Atlantic in the middle of winter.

The fact was that we had no more Sea Harriers beyond the twenty-eight that were afloat and, although they had won their first contest with the Argentineans Mirages, shooting down two without loss, thanks to their superior weapon aiming system and the late-model Sidewinder missiles which we had obtained from our American friends. Nevertheless, it was considered that they might well need backing up, hence the conversion of No 1 Sqn's Harrier pilots to carrier operations and the air defence role, and their deployment south to Ascension and then, via the *Atlantic Conveyor*, to the Task Force where they embarked in *Hermes*. The GR3s were not intended solely for land support; they were also to act as reserves for air-to-air combat, although, in the end they were not actually used for that purpose.

The greatest threat to the two aircraft carriers was from the few Argentinean Super Etendard aircraft armed with Exocet. As far as we knew they had five or six missiles at their disposal; we also knew that the French, who had sold the system to them, were in Argentina at the time. We were never quite sure what part they played in helping,

although I think, at the end of the day, that they probably did not.

Bearing in mind that the operating range of the Super Etendards based on the mainland did not extend much beyond the Falklands themselves, the carriers were obliged to spend a great deal of their time well to the east of the islands, which created a corresponding range problem for the Sea Harriers. Port Stanley airfield had only a short runway. It was unsuitable for the Super Etendard, although it could have been used by A-4s, and it could have been extended. Shortly after the war, we demonstrated the feasibility of extending the runway ourselves, and in very short order, enabling us to deploy Phantoms to maintain the integrity of Falklands airspace, pending the construction of the entirely new airfield at Mount Pleasant. So we certainly did not want to see the Argentineans extending the runway which, had I been in charge of their invasion, would have been a very high priority in my book. Apart from this, in the event unrealised, potential, the Argentineans were known to have based ground attack Pucaras at Port Stanley and to be running supplies into the airfield using Hercules and a variety of smaller aircraft. We, of course, were keen to deny them that lifeline.

The Navy's Sea Harriers later flew a number of sorties in an attempt to hit the runway, but this was an almost impossible task for a single-seat fighter which had been optimised for air defence, as distinct from ground attack work, and it was, in any case, a misuse of this limited resource. Naval gunfire was also tried, but not surprisingly, without any success. Another option was the conventional bombing capability represented by the Vulcan and it was decided that, in spite of the enormous effort required, it would be worth trying to restore its flight refuelling and conventional bombing equipment, both of which had been moribund for several years. This meant that, apart from the engineering work involved, we would also have to train a number of crews who had never previously done any flight refuelling or, indeed, any conventional bombing.

That this was accomplished so quickly and successfully is a great credit both to the crews and to the engineers. So it was that the RAF fired the opening salvo in the Falklands campaign by bombing Port Stanley airfield on 1 May, hitting the runway with one bomb. Bearing in mind the Vulcan's very dated systems and its iron bombs, weapons employment experts will tell you that, in order to render a runway like the one at Port Stanley 'unuseable', would have required some twenty-five to thirty sorties, so, despite what some critics may think, that single

bomb was actually a pretty fair result. I spent the evening of the first BLACK BUCK operation with Adm Fieldhouse, incidentally, and I can assure you that he was entirely in favour of the operation.

Unfortunately, our ability to replay the Vulcan card was limited by three crucial factors: the availability of flight refuelling tankers; the relative priorities that had to be juggled between the demands of Vulcan, Nimrod and Hercules operations; and the physical limitations imposed by fuel stocks and parking space at Wideawake airfield.

Taking the last consideration first, although Ascension had an excellent weather factor, it was a volcanic island and neither fixed nor rotary wing aircraft could operate from anything other than prepared surfaces; to do otherwise would have generated far too much highly abrasive debris. Capacity was limited to twenty-two, or perhaps twenty-four, aircraft at any one time and, although the airfield had previously seen only three or four movements a month as a matter of routine, we were soon rivalling some of the world's busiest airports. Because a Vulcan raid required seventeen tankers and two bombers, it was clear that no other operations were possible at the same time. We therefore had to balance the need for seven tankers to support a long range Nimrod reconnaissance, against a Hercules spares run to the Fleet, which required rather less, and the 100% tanking effort demanded by a bombing sortie. Furthermore, as we have heard, these decisions required three or four days' notice in order to ensure that the appropriate aircraft were at Ascension and to redeploy those aircraft that were not required back to the UK, to Gibraltar or elsewhere.

The upshot of all this was that only five BLACK BUCK missions were completed. Three of them were attacks against the airfield, the last one being carried out on the night before the final push, using airburst weapons with the aim of preventing any of the remaining Pucaras from attacking our troops and, of course, none did. Whether we were directly responsible for that or not is a matter of conjecture.

The other two sorties were flown in an attempt to neutralise an Argentine surveillance radar, using Shrike missiles that had been provided at short notice from USAF stocks. The radar on the Falklands had been a bit of a pain in the neck for us as it had some ability to track our carriers and thus provide targeting information for Exocet attacks. These Vulcan sorties were not spectacularly successful, as the enemy operators were quick to switch off their radars and, although it was

Twin Shrike installation on a Vulcan.

difficult to assess just how much effect we had, given that the crews had received only the barest training and that the Vulcan had relatively little loiter time over the islands, this was scarcely surprising.

So were the raids worth it? I have absolutely no doubt that they were, especially the first one, which sent a very stark message to Argentina – if we could reach the Falklands, then we could reach Buenos Aires. As a result they moved a number of their Mirage fighters north to protect the capital which significantly reduced their ability to escort offensive missions against the Task Force. Had they been able to do so it would have made the work of our Sea Harriers far more difficult. No attempt was ever made to operate A-4s from the damaged Port Stanley runway, nor was any attempt made to lengthen it. The occasional transport aircraft that did use the airfield was hardly relevant to the end result.

Enormous praise is due to the crews who flew very long and, as you have seen, extremely complicated sorties, requiring skills that had only very recently been acquired. The overtasked Victor crews did a magnificent job, delivering fuel, not only at long distance, but often in poor weather conditions at (and sometime actually beyond) the extreme limit of their operating range. So, for all of these reasons, I believe that, expensive though they were, the BLACK BUCK operations delivered a crucial message and a message that was clearly understood in Argentina. They were, therefore, an essential undertaking and they did play their part in supporting the operations of the Task Force.

CHINOOK OPERATIONS – RAF ODIHAM

Air Vice-Marshal Sandy Hunter

Sandy Hunter joined the RAF in 1962, his initial experience being as a recce pilot in FEAF and as a QFI, he later switched to helicopters, serving as a Flight, Squadron and Station Commander in that role. Ground tours included a stint in Moscow as Assistant Air Attaché and staff appointments concerned with policy and plans. Following two years as DPR(RAF), he was Commandant of the Staff College and then Commander British Forces in Cyprus. Since 1993 he has worked in the property and financial services sectors, maintaining his Service connections through his involvement with reserve and cadet organisations, including the TA and RAuxAF.

When I assumed command of Odiham, just before Christmas 1981, I privately felt little of the enthusiasm that I hoped I was showing in public. I had left the station less than four years previously and I remembered that it was then in the grip of what was almost a 'victim culture', understandably perhaps, given the extent of what we would now call overstretch. Overworked and underpaid, the UK-based Support Helicopter Force of the '70s offered fertile ground for the barrack room lawyer! The SH community also appeared to take a perverse pride in being different from the rest of the Service and risked falling between the two stools of the largely fast-jet RAF and a predatory Army Air Corps. I remembered that there had been a constant battle for serviceability of aircraft denied adequate logistic and manpower resources. I had a stark and disturbing image of one of my predecessors in command being run ragged by a superior headquarters which showed little understanding of Odiham's business – and, apparently, little recognition of its efforts.

In late 1981, Odiham was home to four flying units. No 33 Sqn, then in the capable hands of Wg Cdr Simon Coy and a strong team of Flight Commanders, was well on top of the Puma and its role. No 18 Sqn was getting close to completion of its re-equipment with the Chinook and was elegantly and effectively commanded by Wg Cdr Tony Stables. Its support, however, was exiguous and the squadron was in daily competition for spares and other equipment with No 240 OCU and with

the so-called UK Chinook Squadron, soon to become No 7 Sqn. Only the efforts of Engineering Wing and Supply Squadron, in the capable hands respectively of Wg Cdr Mike Windle and Sqn Ldr Peter John, served to manage the strains on an overburdened system. The station itself, built in the late 1930s for two army co-operation squadrons, was bulging at the seams, as it would do until the return of No 18 Sqn to its spiritual home at Gütersloh where no expense was being spared to house it.

The RAFG/Strike Command divide was very apparent in a number of ways, not least to me, having recently returned from the Command. The Chinook, noisy by comparison with its predecessors, had encouraged significant noise complaints from Odiham's neighbours.

In 1981, I took some comfort in the fact that my AOC was the eminently approachable and fair-minded AVM Don Hall but I was also aware of the paucity of SH knowledge in the upper reaches of his staff and of the fierce reputation of his SASO. I would have been happier, as I took command, had I known that, for a golden period of about four months in the spring and early summer of 1982, the problems that I anticipated would, very largely, disappear. That is not to say that there were not minor battles to be fought, internally and upwards, but they were trivial by contrast with the real test to which the station and its major units would be put by the Falklands War. With hindsight, events had an almost surreal quality as the demands of supporting a shooting war competed with the daily round of peacetime bureaucracy and with inter- and intra-Service bickering.

Three aspects of Odiham's support of forces fighting to recapture the Falklands may be of interest today. First, a flavour of life on the station during the conflict, reflecting the tireless efforts of servicemen and their families and of other agencies of the armed forces and in industry. Second, the rather tangled command and control arrangements cobbled together for Operation CORPORATE and their impact upon the station. Finally, what might be called *The Curious Affair of the Blackballed Puma,* brings together many of the strands of the two earlier subjects.

Perhaps the most striking aspect of Odiham's small part in the Falklands War was the speed with which actions were taken for which no contingency plans had existed. Many of these depended on intelligent anticipation at station level and on setting in hand essential work that had not been ordered, or even approved, at higher levels. Aircraft and

Preparing No 18 Sqn's, then very new, Chinooks for deployment to the South Atlantic was Odiham's top priority.

personnel generation were well under way within 48 hours of the invasion, as Tony Stables will tell in his account of No 18 Sqn's war.

Unambiguously, the station regarded support for the Chinook deployment as its most important task, even if others in the chain of command sometimes had other priorities. It is amusing now to recall that preparations for a royal visit (and, in the cases of Lyneham and Wittering, for a formal AOC's Parade and Inspection), competed for the attention of people who really were earning their keep. However, the announcement of a pay award of 8% on 7 May was timely!

Work was immediately started to accelerate aircraft generation. For example, a Puma 300-hour servicing that would normally have taken four weeks was being turned round in less than four days in ASF where 24 hour working had begun immediately. That No 33 Sqn would be sent south along with the Chinooks seemed as likely as it was logical, given the Puma's capabilities. In broad terms, it offered almost twice the performance of the Wessex. In the absence of authorisation, work was set in hand to modify the Puma, to provide blade fold and suitable tie down points for deck operation. By the time formal authorisation was given, it would have been too late to complete the work in time for the intended deployment date.

Much new ground was broken in terms of the equipment of both types.

Working closely with the Electronic Warfare Avionics Unit at Wyton, fits for the installation of ex-Vulcan radar warning receivers were engineered in short order. Perhaps the greatest feat was to extend the range of the Chinook by nearly 100% by the design and building of a ferry tank fit, to allow a possible overland deployment option which was, in the event, ruled out, it was said, by the Foreign Office. That fit, on the face of it a lash-up of ex-Andover overload tanks, was designed and air tested at Odiham on Easter Monday, 12 April 1982. For good measure, a month or so later, a variant of the fit using Air Portable Fuel Containers was flown within 12 hours of the idea having been dreamt up.

In early May, the station served as forward mounting base for the gunners and convoys of No 63 Sqn, RAF Regt, en route from Gütersloh, to embark at Southampton with its Rapier surface-to-air missile systems. They were as impressive as I had known them to be in Germany. On the 26th of that month came a call from the depths of the MOD, telling me that twelve Odiham personnel were unaccounted for, believed lost, following the sinking of *Atlantic Conveyor.* In the endless hour before this totally erroneous message was unscrambled by ourselves, the station moved discreetly to handle what would have been devastating news, had it been true. In this, as in nearly all other events of that testing period, people performed splendidly.

The station continued to work flat out during the campaign and its aftermath. It supported tasking and detachments in the UK and Belize throughout the period. The Chinook Force mounted a major effort on St George's Day, to changeover 2LI and 1DWR in South Armagh. Six Chinooks moved just short of 900 men and delivered the returning Light Infantrymen to their home barracks at Catterick. The royal visit was prepared for and all the usual trivia of station life continued unabated! Throughout the conflict, nearly all of the station's personnel gave 200% effort, willingly and certainly without complaint. They were splendid.

The command and control arrangements for CORPORATE did not always make for clarity, rather they saw Odiham caught in occasional crossfire between the Services and the rather more frequent bursts of fire between Royal Air Force formations. That one was not alone in this situation was a great help and I owed much to my opposite number at Wittering, Gp Capt Pat King, who steered me away from mutiny on more than one occasion.

The appointment to Northwood of a highly competent liaison officer

was a great success and brought directness and clarity to a potentially confused picture. I could not have been better served than I was by Flt Lt Andrew Joy who served to oil the wheels of command and control in every way. It is perhaps unsurprising that less direct relationships did not always work as smoothly. MOD and Strike Command were inevitably remote and, as viewed from the coal face, sometimes out of touch with reality. For example, their insistence on the station playing a part in an ACTIVE EDGE generation exercise when it was generating aircraft for real did not greatly impress management or workers. Later, after the cessation of hostilities, a three-ring circus 'arranged' by MOD, to allow a Minister 'to meet the troops', served only to prepare me for a later appointment as DPR(RAF). It did little to enhance my opinion of politicians!

Perhaps inevitably, the noses most put out of joint by the hybrid C2 arrangements of Operation CORPORATE were those of HQ 38 Group. Regular one-way communication with 'Indignant of Upavon' was a feature of the time. It is perhaps as well that lessons could be learnt in view of the operating posture of today's commands and groups in time of live operations. Perhaps the most significant feature of all, in terms of C2 – more accurately C3 – was the roll out and innovative us of ASMA, the Air Staff Management Aid. ASMA provided secure and timely communications at a time when even FLASH signals were arriving at the pace of second class mail. It was to the Royal Air Force of 1982 what email and mobile telephones are to most of us today.

Only 48 hours after the Argentine invasion of the Falklands, we had begun, off our own bat, the generation of the Puma fleet against the likelihood that No 33 Sqn would be called to join the Task Force. That, and the initially unauthorised modification of aircraft to deck-capable standard, saw No 33 Sqn well placed to respond when the call to prepare came on 14 April. By the 25th, the day on which OC 18 Sqn embarked his aircraft in *Atlantic Conveyor,* the Pumas were in the thick of an exercise in Sennybridge with 5 (Infantry) Brigade, during which they operated from a 'flight deck' hastily painted on the parade square. A week later, they returned with their tails up, having done well in the work up.

On 1 May, as bombs fell on Stanley Airport, came an astonishing *volte-face*. The Pumas were not to go south but the Wessex-equipped No 72 Sqn, resident in Ireland and without a deployment role, was to go

instead. It seemed that the Puma had been judged not to be deck capable. How the French managed to operate Pumas from a deck perfectly satisfactorily without Boscombe Down's approval remains a mystery. At the time, the decision was rumoured to have been made on the partisan advice of a naval test pilot. More charitably, it may have rested on the logistic complication of introducing another aircraft type into the Task Force. It is, perhaps, instructive to recall the part played by an Argentine Puma in the capture of South Georgia before its shooting down by the Royal Marines of Naval Party 8901. It was operated from the flight deck of a support ship, with cavalier disregard of the hazards to which our masters in the UK had been alerted!

On 31 May, I flew a Chinook to Aldergrove, as part of the move of No 33 Sqn to replace No 7 Sqn in Northern Ireland and brought a load of their tradesmen back to Benson. A day later there was a suggestion that the Puma game might be back on again – but that came to nothing. Instead came a signal, saying that all RAF Light Support Helicopter involvement in the campaign was off. The SH banner would be borne, proudly, by Tony Stables and the Chinooks of No 18 Sqn.

Odiham's involvement in the Falklands Campaign inevitably produced numerous lessons. Two are especially instructive. First, command and control arrangements that have been cobbled together *ad hoc* produce strains and tensions within the 'normal' chain of command. The generous and considerate actions of today's chairman went some way to mitigate the pressures that were placed on Odiham and its Station Commander in 1982. Secondly, I could not have been more wrong about the culture and motivation of the people at Odiham. During Operation CORPORATE, when the chips were down, they were magnificent – as were their families and our neighbours in Hampshire. But it took only a week after the ceasefire for me to receive the first low-flying complaint in three months – and not much longer for the first grumbles about overstretch to surface!

CHINOOK OPERATIONS – No 18 Sqn

Air Vice-Marshal Tony Stables

Tony Stables graduated from Cranwell in 1967; he flew helicopters in Oman and Germany before he was selected to introduce the Chinook into service as OC 18 Sqn in 1981. Subsequent tours included time spent at Goose Bay and in Northern Ireland, on the staff of CDS and as COS at HQ 1 Gp. His senior appointments included Commandant of the RAF College, Chief Executive of the Training Group Defence Agency and, finally, Commander KFOR (Rear) at Skopje in Macedonia. He is currently Secretary to the Council of Reserve Forces and flies the Grob Tutor with No 5 AEF.

It is not my intention this afternoon to dwell on the operation of the single Chinook, BN, during the conflict. This has been well documented elsewhere, but instead to give you a personal reflection of the events leading up to the moment when this aircraft arrived on the Falkland Islands.

In late July 1981, five crews graduated from No 1 Chinook OCU course to form the nucleus of the reforming No 18 Sqn. We moved into a largely unfurnished hangar at RAF Odiham – sadly the supply organisation had not thought to make provision for us but, fortunately, a Chinook can carry a lot of office furniture…. Equipped with three metal-bladed aircraft and a significant element of our ground crew, we commenced very limited flying operations (including a tactical exercise in Denmark).

The master plan was for the squadron to build-up at Odiham in terms of aircrew and groundcrew to achieve a strength of thirteen aircraft before deploying to a custom built hangar in Germany. No field operating equipment was provisioned for our use in the UK. In effect, we had no off-base operating capability. In terms of aircraft, in early 1982 we began to take delivery of the fibre composite bladed aircraft. These were transported from the USA by roll-on roll-off ferry, including the ill-fated *Atlantic Conveyor*. However, the UK-supplied cockpit instrumentation was in such short supply that we collected aircraft with no flight instruments or radio/nav aids and flew them in company, VFR, from Liverpool docks to Odiham where, in many cases, the engines were

removed for return to the USA. My understanding was that the manufacturers of the Lycoming engine could not keep pace with the builders of the airframe.

Thus in the six month period August to February we were running very fast to stand still, but then this was broadly the plan. The aircraft were scheduled for a monthly flying rate of 30 hours rising 2 hours per month per year over 5 years to 40 hours. We were at peace and this was to be a very measured build up. We had no spare major component parts, nor were we provisioned for any.

As the year turned into 1982 our deployment to Germany, scheduled for March/April was postponed until later in the year. Although our hangar accommodation was complete, the provision of adequate numbers of (or indeed any) married quarters necessitated such a delay. This had a significant impact upon my groundcrew many of whom had elected to serve unaccompanied at Odiham for the six-month build up period prior to deployment to Germany. Many were required to continue to do so for almost two years.

Fortunately, I guess, the conflict intervened. Although, of course, we did not feature immediately in what was principally a naval affair. As you have heard the Puma was the preferred choice.

On 6 April I led a detachment of four aircraft to Culdrose for operations in support of the Task Force. I, like many others, had assumed that this force was positioned somewhere off Ascension Island whereas, in fact, it was not too far off Lands End. In the event we spent some two days ferrying between Portsmouth and the Task Force loading essential, but omitted, items. The transfer, as an under-slung load, of a seven-ton bearing out to a major vessel really demonstrated the enormous utility of the Chinook. In the course of this exercise, conducted at night in quite appalling weather, the Chinook came of age.

I have no idea of the factors that called for our deployment at this late hour but, notwithstanding, it was decided that we should deploy aircraft to both the Falkland Islands and to Ascension Island. Numbers were initially very fluid and dependent upon a suitable vessel being located. Vessels were identified and pilots sent to docks nationwide to assess their suitability. In the event the *Atlantic Conveyor* was selected and I conducted a reconnaissance of the ship as it was being adapted, most notably by the provision of a strengthened deck. Planning proceeded at a pace, although it would be true to say that the aim was not always clearly

evident. Sandy Hunter has touched on the development of the ferry capability and this in itself resulted in some hasty planning on overland/oversea self deployment options to Ascension Island. RWR was fitted although advice on missile countermeasures was largely restricted to the use of a red Very fired off the rear ramp! Fortunately we were only locked up once and, in the event, the threat never materialised. These were long days and short nights. Indeed the voyage south was a welcome break!

The eventual plan was to deploy four aircraft to the Falklands and one to Ascension. You will recall, however, that we had no spares. Major components had to be robbed from other Chinooks, so the total involvement was actually rather more than the notional five aircraft. The Ascension deployment was relatively straightforward – aircraft by sea and crews by air to an established operating base. The Falkland deployment was more problematic, governed by the available messing and accommodation on the transporting ships. In the event I was limited to a maximum of seventy-seven personnel, to include aircrew, groundcrew, caterers, RAF Regiment and JHSU staff (essentially hookers-up). It sounds a generous amount for four aircraft but, given that we were to establish an independent base ashore in a hostile environment, with a break down of twenty-eight aircrew, ten Regiment, eight-to-ten JHSU and a very inexperienced engineering team, it was probably about right.

We had to take a lot on trust; after all we did not possess an off-base operating capability in terms of equipment. We had been formed as a squadron for six weeks with a new aircraft – not just a bigger Puma but a wholly new concept. No one, anywhere, had any experience of triple-hooking of underslung loads or of operations from ships. In the event, we quickly mastered both disciplines and a lot more besides. On 25 April, we flew our aircraft to HMS *Drake* and onto the deck of the *Conveyor* where the blades were removed and stowed inside the fuselage, and the aircraft sealed in custom-made zip-up bags – 'Driclad' plastic covers. This was quite brilliant, which is probably more than I can say for the rest of the plan.

In essence, the *Conveyor* provided through-deck stowage with crew accommodation for approximately thirty within the main island. I was able to position two crews and a small engineering party (total twenty) on board for the journey south. The plan for the remainder, including

myself, was to fly to Ascension Island (thus assuring a further ten days in the UK before deployment) and then join the MV *Norland*, a North Sea ferry. As I was assured at naval headquarters at Northwood, these two ships would sail in parallel to the Falkland Islands where, in a safe air environment and with a secure beachhead, we would cross-deck and commence operations. Communications and combat supplies would be provided!

The *Conveyor* part of this equation went ahead, largely without hitch, as did our flight to Ascension, although the transfer to the *Norland* was not without its moments, given that, individually, it was impossible to carry the amount of flying and survival clothing with which we had been issued. Additionally, no one had thought to inform 2PARA that we were joining – or so they claimed. This resulted in an undignified shouting match while we sought to find somewhere to sleep, compounded by our being asked to leave the Officers Mess after 1800 hrs because the colonel insisted on jacket and tie!

Having overcome these minor, but irritating, difficulties we settled into a daily routine of preparation and training. We were, as promised, sailing in parallel with the *Atlantic Conveyor* and from time to time I took the opportunity offered by the RN of cross-decking to visit my personnel. The mood was buoyant, but it was difficult to engage in any serious planning other than to determine a method for getting ourselves from the ships to an operating base ashore. Our field equipment (largely unseen) and ammunition was loaded somewhere aboard the *Conveyor*. The future posed no difficulty; we had a fantastically capable new aircraft captained by pilots who had all completed at least four support helicopter flying tours. Information was scant and gleaned only from broadcasts on the BBC World Service.

We awoke one grey South Atlantic morning, 18 May, to see ships from horizon to horizon, some twenty plus. I signalled the Task Group Commander, requesting cross decking of fourteen personnel to ensure that we could develop an early operating capability. There was no response. I repeated the message on 19 May but again there was no response. The next morning, 20 May, revealed what turned out to be the Amphibious Group and, of great significance of course, the *Conveyor* had left the formation with the Carrier Group. Thus pilots and aircraft were now separated.

Colonel H Jones, the CO of 2PARA, asked me to accompany him to

the bridge. We were heading west, fast and on a direct course, as opposed to the usual anti-submarine zigzag. When questioned, the master replied that he was following the one in front. All was revealed when a passing frigate fired a line with a message revealing that H-hour had been declared some seven hours previously. Later conversation with the master of the *Europic Ferry* revealed that they never received an order. Final preparations began for the Paras who, very kindly and generously, agreed to six rounds of pistol ammunition for me and each of my officers. We never received any more during the whole campaign!.

On 21 May, we rounded Fanning Head aboard the lead vessel and anchored in San Carlos Water. 2PARA disembarked. Our option to do likewise was seriously compromised, in that we had no combat supplies, no ammunition, no equipment, no communications and, above all, no function. Thus we remained aboard the *Norland* to witness, at close hand, waves of bombing each day. We broke the monotony by mounting our aircraft GPMGs on oil drums in the anti-aircraft role, although these were of limited value, given that we had no tracer.

To be honest, it was a little hot in San Carlos Water and the *Norland* was ordered back out to sea and relative safety. However, having just got there, we turned round to sail back in, just as the first attack wave of the day flew in.

Reassured that someone was thinking of us and our safety – we had a definite probability of four Chinook and no crews – we were cross-decked to one of the assault ships. Established back in the sound, I utilised an army Scout helicopter to carry out a reconnaissance of a possible operating base for our Chinook. The small hamlet of Port San Carlos was really the only option close to the proposed Harrier strip and fuel. I also visited Commander 3 Brigade to seek to sort out lines of command and tasking. However, we were understandably of little interest at this stage of the campaign. Back on the assault ship we were definitely in the way. I thus negotiated for us to be helicoptered ashore after breakfast to the relative security of the hillside where we idled away the day watching the bombing until sunset when we returned to the ship for dinner. Imagine the excitement when I was advised of the plans to bring the *Atlantic Conveyor* into San Carlos Water. At last, time for some detailed planning to get people and equipment in the right numbers in the right place to give us the earliest possible operating capability. We were really buoyant.

'The Survivor', ZA718/'BN', seen here on a wintery Port Stanley runway in June 1982.

Sadly, my next meeting with Commodore Clapp was when he informed me that the *Conveyor* had been struck by an Exocet. The following day, as we sat on the hillside, with our ration packs, our single survivor, BN, flew into the sound and landed among us.

I selected an operating and support team for this one aircraft and thinned out the remainder aboard the *Europic Ferry* to await further instructions.

We never did get any off-base field equipment and, up until the moment we left in August, we were located in the settlement buildings of Port San Carlos. We lived on straight composite rations until well into July and, despite many promises made by a series of communications officers, continued to receive tasking and communicated with higher formations through a hand held HF radio which formally belonged to the Royal Marines and for which my deputy had swapped a pair of flying gloves.

It would have worked, and it nearly did work. Why? Because of the quality of my people and their training. They were simply fantastic. We started from nothing and ended with practically nothing, and all in all it was a great opportunity wasted. In 1982 few people understood the capability of the Chinook, four of which would have made a significant impact on the campaign. Fortunately, the mistake has not been repeated, as Chinook has always been a first choice aircraft since then.

MARITIME OPERATIONS FROM ASCENSION

Wing Commander Derek Straw

Derek Straw joined the RAF in 1961 and spent practically the whole of the next 34 years as a navigator in the maritime world. This involved flying tours on Shackletons and Nimrods and staff appointments with the RN and with major NATO maritime commands. For the last five years he has been flying with FR Aviation as a systems operator on the Dornier 228, Britten Norman Islander and C26 Metroliner, again, predominantly in the maritime surveillance role. Unfortunately, ageism has recently raised its ugly head, and despite his nearly 10,000 hours of practical experience, he is once more available for employment!

Between early April and August of 1982 I enjoyed three separate detachments with Nimrods to Ascension Island (ASI). My first move was courtesy of the initial Nimrod MR1 detachment, with the aim of joining Admiral Woodward's staff. Fortunately the press gang rejected me as excess baggage and I was able to rejoin my MR2 crew busily training to return to ASI with a much modified aircraft. After the Argentine surrender I commanded the much reduced Nimrod detachment. But I am getting ahead of myself. The MR1 was equipped with ASV-21 radar and, of course, a normal Nimrod endurance of 9 hours. This allowed the traditional Nimrod roles and tasks to commence but, crucially, confined them to within 1700 nms of ASI.

After two weeks, the first of the upgraded Nimrod MR2s, equipped with the more powerful Searchwater radar, began replacing the MR1s. The Searchwater, with its classification capability and IFF interrogator, brought immediate benefits to the efficiency of the Nimrod task. However, once the units of Task Force (TF) 317 were beyond Nimrod's range, ultra long-range surface surveillance had to be passed to Victor tankers operating in the MRR role – possibly with Royal Navy helicopters in the low-level identification role. In particular, the Victors provided surveillance in advance of the re-taking of South Georgia by HMS *Glamorgan* and TF units.

It was the arrival of the first air-to-air refuelling (AAR) capable MR2P in early May that gave us the required reach. The rapid provision

of

A Nimrod taking advantage of one its many newly-acquired capabilities.

of an AAR capability was a prodigious achievement by all involved, both in industry and in the air force. Although, with hindsight, I doubt that the training of our pilots was fully mature, to judge from the occasional Victor cry of 'Back off, too close!' Our crew was fortunate to have one of the first AAR trained pilots, and we were first in theatre with the capability. The ability to operate off the Argentine coast and within sight of the Falklands considerably enhanced the support that we could give to the TF, as well as literally broadening our horizons.

In addition to the continuing Direct Support roles and protection of the ASI base, there was surveillance for Soviet snoopers – a *Bear D* and a *Primorye* intelligence gathering ship (AGI) – and for Argentine merchant ships and their ELINT-equipped Boeing 707, which was thought to be shadowing the TF units. Finally, there was airborne Search and Rescue (SAR) and rendezvous assistance to Victors, to BLACK BUCK Vulcans and to deploying Harriers. It has to be said that ASW was a minimal task.

This busy programme usually required at least a daily sortie from the Nimrod detachment, which varied in size between two and five aircraft

supported by some fifty groundcrew. When an AAR-extended sortie was required to survey the TF exclusion zone or the approaches to Argentine ports, at least seven Victor tankers plus spares were required to support the outbound two tanking slots, plus a further pair of Victors to provide the inbound tanking. However, if priority for the long range effort was given to Vulcan or Hercules tasks, the Nimrods had to be left to their own devices in terms of fuel, unless we could scrounge a few thousand pounds from a returning tanker.

The improved capability that the MR2 provided was welcome. But it has to be said that there was minimal operational experience with the powerful new sensors. On occasion this did lead to somewhat overconfident reporting of radar contacts – to the chagrin of Adm Woodward. But hindsight provides perfect vision; at the time all our sensors had indicated 'warships'. (Perhaps the call would not have been made if we had had sight of the 'big' picture?)

The ability to fly sorties of up to 24 hours – a limit imposed by engine oil consumption – also required extra crew, usually a tanking pilot, an additional air engineer and sometimes a navigator (and for the sorties on task near to the Argentine coast, some 'communications and language' specialists were also tolerated!). The increased endurance demanded additional potable water capacity, galley stowage plus, of course, an extra portaloo! It was also the first time in my maritime experience that I was issued with an immersion suit. Although their efficacy in the tropical climate of ASI was questionable, they were a reassuring addition when we arrived in the colder southern latitudes.

Great changes were wrought to our weapons capability. The Nimrod, already blessed with a cavernous bomb bay plus underwing hard points, now gradually added to its armoury: 1000 lb HE retarded bombs; up to three of the new (still on trials) Stingray ASW torpedo; up to two Harpoon anti-ship missiles; two or four Sidewinders; and IR flares. Although none of these were used in anger, it did represent quite an arsenal. It gave a real sense of capability to operate 3500 nms from home with the ability to hit anything that moved under, on or above the water, and still be able to offer SAR assistance!

This period of conflict and equipment changes, not surprisingly, brought its share of challenges. The initial range and endurance problem, as we have seen, was overcome by AAR. The many modifications imposed steep learning curves as SOPs and checklists on increasingly

tatty bits of paper became the norm. New tactics and procedures were learned at speed as the Nimrod force settled into its new-found roles, including low-level bombing and fighter evasion. The bombing was a real step change from 8 lb break-up bombs to 1000 lb HE, although the bombsight remained a chinagraph line on the windscreen. The fighter affiliation and AIM-9 training was great pilot sport but very necessary in anticipation of those bright sunny days off Rio de la Plata.

Other problems that we encountered included:

1. Navigation in an unfamiliar area – with foreign fishing fleets, some of which exhibited radars uncannily close to military parameters and looked like warships on our radar.
2. A closed-loop inertial navigation system designed for nine-hour sorties and whose output could affect sensor performance.
3. A lack of assurance that the long range Omega fixing system would be accurate or adequate in the South Atlantic.
4. An initial lack of suitable maps and charts – at first, I planned my sorties on a meteorological chart with a scale of 1 to 10 million – great for small cocked hats when astro fixing! There was also the embarrassment of arriving at your tanking slot to find the Victor displaced some considerable distance to the west! This did nothing for pilot-navigator relationships, but once the properties of Lamberts versus Mercator projections were recalled harmony was restored!

The final challenge was the forward operating location capability of ASI about which you heard earlier from David Pierce. I would add that, prior to the arrival of ASMA and the TCW, one innovative solution was to employ a grounded Nimrod as an HF communications station with the galley doubling up as the planning office.

This was a challenging and innovative time for Nimrod operations, but our skills and training proved to be sound. The flying was hard and great fun. After a twenty-hour adrenaline charged sortie with three tanking slots, some at night or in cloud, the sight of ASI on our return and the thought of a beach barbeque to use up our remaining aircrew rations after the crew debrief was indeed welcome.

Finally, I must praise all the backup teams at home base, the legions of ground crew – especially the armourers – the Victor crews, and the USAF and PanAm who provided unstinting support at this busy airfield before we had a SWO and the other trappings of an RAF station. The airfield was indeed aptly named Wide Awake.

RAF REGIMENT PARTICIPATION IN OPERATION CORPORATE

Group Captain Kingsley Oliver

Kingsley Oliver served in the RAF Regiment from 1947 until 1978. Command, staff and instructional appointments at home included RAFC Cranwell, the RAF Regiment Depot, HQs Fighter and Air Support Commands and MOD, and overseas in RAF Germany, NEAF, the Arabian Peninsula and FEAF. After leaving the Service he spent two years in Teheran managing BAe's Imperial Iranian Air Force Rapier Programme before becoming Senior Project Manager for all overseas Rapier contracts at BAe Stevenage. He has written and been published on a variety of aspects of military and civic history, including several works on the RAF Regiment.

Introduction

RAF Regiment personnel in Operation CORPORATE accompanied Nos 1 and 18 Sqns; others were at the staging post on Ascension Island and with the Rapier squadron which was tasked with the defence of the Harrier forward operating base in the Falklands. The role of the Regiment personnel with the two flying squadrons is beyond my remit today, but I shall touch briefly on the tasks of the Regiment detachment on Ascension before addressing my main theme which is the deployment of No 63 Sqn RAF Regiment, with its eight Blindfire Rapier systems from the UK to the Falklands from May until September 1982.

The Staging Post

The limiting factors of fresh water, accommodation and catering inevitably restricted the number of reinforcement personnel which could be stationed on Ascension Island. Although there was considered to be a potential risk of attack by Argentine special forces, dropped off from a passing merchant ship, only a tactical wing HQ and one flight of a UK-based field squadron – a total of thirty-nine RAF Regiment officers and airmen – could be deployed to provide a ground defence operations cell and a quick reaction force for the airfield as a whole. Ground defence planning for the staging post was exacerbated by the absence of a JTP for activation of the airfield, a lack of communications equipment for the

implementation of station defence plans, the despatch of RAF personnel from the UK without their personal weapons and the infinite variety of dress among Service and civilian personnel which made it very difficult to identify any potential intruders.

The Voyage South

On 12 May No 63 Sqn embarked on RMS *Queen Elizabeth II* at Southampton and sailed for Ascension and South Georgia that afternoon. The squadron's heavy equipment – fire units, radars, missiles, stores and spares – together with its forty-eight prime movers and forty-four trailers had already been loaded on *Atlantic Causeway* at Devonport and had sailed the previous day with only five squadron airmen on board.

On board *QE II* No 63 Sqn became responsible for co-ordinating the air defence of the ship by the embarked Army and RAF Regiment units, using 7.62mm and .50" machine guns and Blowpipe missile systems. During the voyage No 63 Sqn was unexpectedly declared to be a 'Forces Asset' and was transferred from the command of HQ 5 Infantry Brigade to the direct control of Commander Land Forces Falkland Islands (CLFFI). A solitary Regiment officer was transhipped from *QE II* to HMS *Fearless* to act as the Rapier liaison officer at HQ CLFFI where, being without communications and support, he was unable to exercise any influence on the Rapier defence of the Harrier FOB.

The Landing

QE II arrived off Grytviken on 28 May and No 63 Sqn's personnel were cross-decked to three different ships: SS *Canberra*, MV *Norland* and RFA *Stromness*, with the result that the Squadron Commander was deprived of control of his unit at a critical stage of the operation. The rationale for this was that the anti-aircraft defence of the ships by the squadron's machine guns on the passage to San Carlos took precedence over the timely and effective deployment of the Rapier defence of the Harrier FOB.

Atlantic Causeway arrived at San Carlos on 1 June and over the next 24 hours the Regiment liaison officer in CLFFI's HQ and the five gunners on *Atlantic Causeway*, with some assistance from the Royal Engineers, managed to get all the squadron's vehicles and equipment ashore by using Mexefloats, which was a somewhat precarious operation. *Norland* arrived on the morning of 2 June and *Canberra* followed that afternoon but *Stromness* did not reach San Carlos until the

afternoon of 3 June. The disembarkation of No 63 Sqn from all three vessels was delayed by the priority given to Army personnel and the squadron did not land until late in the day – and in a completely haphazard sequence.

Deployment

The Squadron Commander had received no directions from the Force Commander, did not know where his Rapiers and vehicles were and had no time for reconnaissance and the consequent planning of his Rapier positions. It was rather like a re-run of the WW II landings in North Africa and Sicily but, with the Regiment's long experience in creating order out of chaos, the squadron rapidly reorganised and began to deploy in terrain very different from the North German plain, without the advantages of prior reconnaissance or direction from higher authority.

However – and despite these little local difficulties – by the afternoon of 3 June all eight Rapier systems were operational in defence of the Harrier strip at Port San Carlos. Six Rapiers had been airlifted by Wessex helicopters to sites on surrounding hills and two were positioned in the valley. SOPs were agreed with OC 1 Sqn and the OC FOB so that aircraft entered and left the defended area via Fanning Head and 'Weapons Tight' was in force for all aircraft movements. This worked well for the fixed-wing aircraft but the lack of IFF in the helicopter force caused problems for the Rapier fire control radars which were continually locking on to those helicopters which flew within their range. When this occurred the only solution was to shut down the Rapier Blindfire system, which in turn seriously degraded the ground based air defences.

Whether the presence of eight Rapiers acted as a deterrent, or because the Argentine Air Force had decided beforehand not to engage in counter-air operations, there were no enemy air attacks on the Harrier FOB and on 30 June No 63 Sqn was redeployed to Port Stanley airfield where it established the framework of the long-term GBAD for the airfield until it was relieved by another Rapier squadron in September. Leaving its heavy equipment in situ, No 63 Sqn returned to RAF Gütersloh by air in two lifts on 4 and 15 September.

Lessons

The last-minute transfer of No 63 Sqn from HQ 5 Bde was unfortunate in that HQ CLFFI did not have the capability to exercise

command and control over a ground based air defence environment. Had this decision been made at the outset, provision could have been made for a proper GBAD cell, headed by a Regiment wing commander, in the Force HQ.

Army Rapier units lacked the training and expertise for operating a Short Range Air Defence Zone around an airstrip. The Army's requirement for anti-aircraft defence is to protect ground forces in the forward area where the engagement of hostile aircraft takes precedence over the positive identification of friendly aircraft. It was probably fortunate for No 1 Sqn that T Battery RA had moved forward from San Carlos to Fitzroy and Bluff Cove where its Rapiers continued to operate at 'Weapons Free'.

There was a declared threat of ground attack by Argentine special forces on the San Carlos FOB, but no RAF Regiment ground defence units had been included in the force. Consequently, ground defence of the Harriers was an *ad hoc* affair, depending upon the goodwill of any Army or RM personnel who happened to be temporarily in the vicinity.

Finally, the haste with which Operation CORPORATE had to be planned, at least as far as No 63 Sqn was concerned, resulted in a repetition of many of the failings of Operations TORCH and HUSKY in 1942 and 1943 when Regiment units were dispersed among a variety of ships, separated from their equipment and landed on the invasion beaches without any regard for their urgent operational deployment to forward airstrips. Fortunately, on this occasion the results were not as damaging as they had been forty years earlier.

Sources:
Sqn Ldr I P G Loughborough (OC No.63 Squadron RAF Regiment).
Wg Cdr T T Wallis (Senior Regiment Officer, Ascension Island).
Gp Capt A B Stephens (Deputy Head, Air Historical Branch).

LOGISTICS AND THE FALKLANDS CAMPAIGN

Air Commodore Peter Dye

Peter Dye was commissioned into the Engineering Branch in 1972. His subsequent career has concentrated on aircraft-related appointments, his 'hands on' experience embracing the Victor, Canberra, Vulcan, Tornado and Jaguar. In the latter case, he was directly responsible for the deployment and support of the Coltishall Jaguars sent to the Gulf in 1990-91. His most recent appointment was as Deputy Chief Executive, Defence Aviation Repair Agency and Air Officer Wales; he is currently Air Commodore Ground Training with the Training Group Defence Agency.

INTRODUCTION

For many the Falklands Campaign was a distant affair. Working in the Central Servicing Development Establishment I can perhaps claim to have been more remote than most – but not entirely so, as I will explain later.

Surprisingly little has been written about the logistic aspects of the Falklands Campaign – although security of supply and extended lines of communication were a major and continuing preoccupation in the planning and conduct of operations. I am grateful to the Society, therefore, for the opportunity to record some aspects of a complex and significant story.[1]

The passage of time also provides an opportunity to reflect on the engineering and supply lessons learned. Two questions are, I believe, worthy of debate, the extent to which the demands made on the RAF logistic system were unprecedented – at least in Cold War terms – and, secondly, whether they had any bearing on our readiness for the Gulf War some eight years later.

It is always tempting to identify key moments in history, but from a logistics perspective the Falklands Campaign was, if not a turning point, the first sign that one might be approaching.

The RAF's support posture in the early 1980s reflected the assumption that a short but intensive war would be fought from well-found main bases. Our logistic arrangements were centred on significant

The crowded facilities on Ascension Island. While Widewake was more primitive than most of the airfields that they customarily frequented, the Victor fraternity's extensive experience of operating away from base stood them in good stead.

forward holdings of spares and munitions together with extensive *in situ* repair and recovery facilities. On the face of it, we were not well prepared for expeditionary warfare – there were certainly no relevant, detailed contingency plans and few resources for deployed operations. Much has also been made, quite properly, of the immense distances involved in mounting effective air operations during the Falklands Campaign and the challenge of out-of-area operations. And yet, if we are honest, the RAF was not totally unprepared for what transpired.

If I may take as an example (with which I was personally familiar as No 57 Sqn's JEngO and Unit Mobility Officer in the late '70s), the Victor tanker force – so crucial to exercising air power over the thousands of square miles of the South Atlantic – was practised and confident in its ability to sustain deployed operations. This confidence was built on the back of regular peacetime exercises. The engineering problems faced in operating from Ascension Island were not totally dissimilar from the demands of routine deployments to North America and the Mediterranean in support of various Flags and Trails, as well as the short-notice Tansor commitment (although, admittedly, these never included the effects of volcanic ash or the absence of a parallel taxiway).

Fly Away Packs (FAPs), tool kits, specialist equipment and detailed plans existed and, more importantly, had been proved.

This is not to suggest that the logistics challenges faced by the RAF in the Falklands Campaign were routine; but they were not unprecedented. The Harrier force, like the Jaguar, both of which were earmarked for an ACE Mobile Force and/or Regional Reinforcement role, was experienced in deployed operations and had the necessary supporting equipment as well as the underpinning doctrine and training. A similar case could be made for the support helicopter, maritime and air transport forces. Of course, deployed operations are not the same as expeditionary warfare, but while the RAF was largely focused on supporting NATO's Central Region, significant elements of the Order of Battle, were prepared for wider employment – if necessary at some distance from the main base.

This ability should not be taken lightly. Deployed operations demand a competence and confidence that many, if not most, air forces do not possess. Even today, a number of NATO's European air forces still find the prospect of operating away from main bases well outside their comfort zone.

Now, I am not arguing that the RAF was fully prepared, either for deployed operations or for expeditionary warfare – the record indicates otherwise – but I believe we can paint too dark a picture if we are not careful. The logistic contribution to the Falklands Campaign was built on strong foundations.

I shall return to these themes later but, in view of the limited time available, I will now briefly review the logistic challenges faced by the RAF before finishing with lessons learned.

ENGINEERING

Generation

The initial engineering task was to generate aircraft (including RN Sea Harriers). However, beyond this first flurry of activity, the RAF's capacity to assist the Task Force was influenced by shortcomings in role equipment, particularly in regard to AAR, stand-off weapons, long-range navigation, communications and EW. In fact, CE(RAF) later observed that much of the subsequent engineering story concerned ways of making good this shortfall.[2]

Modifications

From the very beginning, it was evident that aircraft, equipment and weapons would all require some degree of modification. As plans became more detailed so the intensity of engineering and support activity grew. The situation was so fluid, however, that it became essential to agree priorities between various projects and courses of action. As the AHB narrative points out with a degree of understatement 'the preparing, investigating, developing, manufacturing and installation of urgent modifications required careful staff oversight and co-ordination.'[3] This task fell to the Alert Measures Committee (AMC) under DofOps(Strike) that provided a regular aircraft priority listing. It is an interesting reflection on the actual priorities to note that it was the Hercules that headed this list throughout April and the Victor in May and June.

At station level the impact of the quickening pace of modifications was all the greater as the training task increased equally rapidly, exacerbated by the adoption of new roles and the reactivation of old ones. Industry made a significant contribution to these efforts but the major burden of the modification programme fell on the flying stations and a handful of support units, including St Athan, Sealand and the EWAU at Wyton.[4]

Not surprisingly, formal staffing procedures were found to be incapable of meeting the necessary response times for Urgent Operational Requirements. The widespread use of Special Trial Fits resolved the immediate issue but did nothing to address the longer-term implications for spares and engineering support. Inevitably, corners were cut and lower safety standards accepted. Sometimes it was necessary to bypass the normal chains of command. But the outcome was that the design, testing and installation of many operational improvements were achieved in quite remarkable timescales.

Rather than describe this effort in detail, I will focus solely on the modifications to the Harrier. However, it is worth noting that the overall programme, although not as large as that implemented during the Gulf War, involved over ten aircraft types and at least sixty separate modifications.[5] Given the pressure of time and the operational uncertainties, it was a hugely impressive achievement on the part of all involved.[6]

On 14 Apr 82 Engineering Wing at Wittering was tasked with modifying the Harrier for shipboard operations. The programme

The Harrier's potential as an air defence fighter was enhanced by arming it with the AIM-9 Sidewinder.

involved eighteen modifications, of which seven were directly associated with the navalisation of the Harrier. The initial plan provided for just twelve aircraft to be modified but this soon rose to over twenty. Major elements comprised changes to the INAS to allow alignment on a moving platform, nosewheel steering, nozzle detentes for ramp take-offs, fuel control units and the introduction of an AIM-9 capability, I-band transponder, tie-down shackles, drain holes and weather-proofing. To achieve this in the time available while working up the squadron required additional aircraft and an intensive round-the-clock effort over a seven-day week.

Inevitably, matters did not go entirely smoothly, particularly the issue of compatibility between the aircraft systems and the CVS. The AIM-9 and INAS modifications were even more time-consuming and it was only the delay in the deployment of the Harriers that allowed these to be completed in time. Altogether, eighteen modified aircraft were deployed of which nine (the second wave) were also fitted with ALE-40 chaff and flare dispensers and ECM. The latter, unofficially known as 'Blue Eric', after its project officer Squadron Leader Eric Annal, went from concept to manufacture, testing and deployment in the incredible time of fifteen days.[7] A further two modifications were introduced in May (for LGB and Shrike) the necessary kits being despatched by air to the Task Force.

SUPPLY

I will return to the operational aspects of the engineering effort but

before I do so, the picture needs to be balanced by an understanding of the wider supply contribution and, notably, the movements task.

Initial supply activities concentrated on the issuing of spares and accommodation stores to the Task Force and the planning necessary for continuity of supply and the replenishment of stocks. In this regard, the AMC aircraft lists were invaluable in providing the essential guidance on priorities. The overall position on engines and airframes was generally satisfactory, although the availability of role equipment and some Harrier spares were a cause for concern. A major challenge, however, was the assembly of a FAP for the Chinook, which, given the austere initial spares provisioning, gave rise to many shortages. Finally, the Vulcan represented a special case as plans were well advanced for disposal and, although these were suspended on 13 Apr, retrieving role equipment, especially refuelling probes, proved problematic.

Movements

Management of the movements task was a Joint Service responsibility exercised through the Defence Operational Movements Staff (DOMS). The initial problems related to the provision of shipping, including the necessary modifications for the transport of aircraft. However, in the absence of any relevant contingency plans, DOMS was continuously working against the clock.

Ascension Island was of vital importance both as a forward support base and as a forward operating base; it was in effect our logistic centre of gravity.[8] The first Hercules into Ascension Island carried advance parties of Tactical Communications Wing (TCW), Tactical Supply Wing (TSW) and the UK Mobile Air Movements Squadron (MAMS). Thereafter, the main movements effort, beyond activating the airbridge and developing the airfield's facilities, focused on the outload of equipment destined to await the arrival of the Task Force. From an initial trickle, a regular pattern of six Hercules and three VC10 flights a day emerged, each flying a round trip of over 7000 nautical miles.

In the absence of any organic heavy lift capability, following the disposal of the Belfast fleet, it was necessary to charter additional transport aircraft at very short notice. For example, there was just twelve hours warning of the deployment of the first Victor tankers to Ascension Island. The movement plan, requiring a total of fifteen aircraft, including two Belfasts and two Boeing 707 freighters, was completed only seven

hours before the first aircraft landed at Marham to load equipment and personnel.[9]

In short, the responsiveness and effectiveness of the supply and movements organisation cannot be over emphasised, embracing as it did the largest sustained operation since the Berlin Airlift.

Fuel

The provision of adequate aviation fuel supplies was probably the biggest supply challenge of the Falklands Campaign, threatening at one stage to severely curtail operations. It was clear by 11 Apr that any expansion in operational options beyond air transport and maritime reconnaissance would rapidly exhaust fuel stocks on Ascension Island. With the arrival of the Victor tankers, the fuel supply situation became critical. The immediate problem was resolved by agreement on access to USAF stocks, including reserves, and the arrival of a replenishment tanker on 24 Apr. Even so, it was only with the completion of a 3½ mile pipeline from the reception tanks to the airfield on 10 May that the availability of aviation fuel ceased to be a major concern.

OPERATIONS

Deployment

Ascension Island remained the main focus for RAF logistic activity throughout the campaign. Beyond the early specialist teams, small ground parties were deployed throughout April to support Hercules, Nimrod, Vulcan and Victor operations, although the latter would grow to some 150 strong as increasing numbers of Victor tankers arrived. In fact, manpower numbers were strictly controlled with the result that at times it proved difficult to persuade the authorities of the need for additional skills and expertise. However, in view of the problems faced at Wideawake in finding adequate space for aircraft parking and the limited domestic and technical accommodation, it is perhaps not too difficult to understand the need for economy.

By comparison, No 1 Sqn's ground party, which left Wittering on 1 May, comprised just forty tradesmen. Of these, only eighteen and an engineering officer would join the six Harrier GR3s on the *Atlantic Conveyor*, together with a small ground party from No 18 Sqn accompanying their four Chinooks, the aircraft being specially protected against the maritime environment for the journey south.[10]

Once embarked on HMS *Hermes*, shipboard duties, and the need to

cover two watches, meant that No 1 Sqn's manning was stretched very thin. RN servicing procedures were followed but it took a few days to settle into the routine of deck operations and the challenge of working at night on a pitching ship using red-filtered torches.[11] Although the groundcrew had access to onboard workshops, maintenance was a constant struggle requiring careful choreography in the hangar and, while contingency servicing was employed with the minimum of paperwork, it was soon decided to deploy an additional twenty tradesmen to assist in routine servicing and turn-rounds. In the event, however, only four armourers had joined the squadron before hostilities ended.

In addition to the remaining No 18 Sqn personnel embarked on the *Norland*, small, but significant engineering ground parties were deployed to the Falkland Islands drawn from the Tactical Communications Wing, the Joint Helicopter Support Unit and the RAF Explosive Ordnance Disposal and Aircraft Battle Damage Repair (ABDR) organisations.[12]

Availability

Serviceability across all aircraft types remained high throughout the campaign, with four or five of the six deployed Harrier GR3s being available most days. Availability of the Victor tanker force was even better, with very few operational sorties being lost to unserviceabilities while the reliability of the sole remaining Chinook was legendary.[13] That the flying effort was generally much greater than the planned wartime rate (by a factor of 2.6 for the Hercules in May)[14] speaks volumes for the professionalism and ingenuity of the groundcrews, both in-theatre and back in the UK, as well as for the legacy of high peacetime standards. The same cannot be said of the Argentinean forces that faced growing availability problems across a number of aircraft fleets as the war progressed, at least one Skyhawk unit being stood down in May because of low serviceability.[15]

Spares

As was discovered during the Gulf War the supply pipeline rapidly became congested as operations developed such that urgent spares were delayed or mislaid and large stocks of unserviceable repairables built up. The Victor tankers in particular began to suffer from a shortage of serviceable LRUs, a problem that was only solved by the deployment of a Transportable Air Radio Defect Investigation System (TARDIS) from Waddington that repaired 91 LRUs *in-situ* over the period 9-25 June.[16]

The smouldering hulk of the Atlantic Conveyor.

Even so, the slow speed of the pipeline and the poor visibility of items in transit were never really resolved and it was perhaps fortunate that hostilities ended before the repercussions were fully felt.

ABDR

An RAF ABDR kit was deployed on *Hermes* and, together with onboard facilities, proved more than adequate to repair the six Harriers that suffered battle damage, all in the ground attack role. Much of the credit was attributed to good training and peacetime preparation. Similar success was achieved in repairing a Victor tanker that suffered significant damage from the disintegration of a HDU. By comparison, RN ABDR training was rudimentary, if not non-existent, and no specialist repair kits were available.[17] Moreover, there was a reported reluctance on the part of some maintenance staff to accept that BDR was safe!

Loss of the Atlantic Conveyor

Finally, it would be remiss not to mention the unfortunate loss of the *Atlantic Conveyor*. Not only did it reveal the vulnerability of the lines of communication but it also had a significant impact on logistic support. The loss of valuable aircraft apart, the destruction of tentage, equipment for the Harrier Forward Operating Base, spares, documentation, specialist tools and munitions proved almost as damaging. Air power has been likened to ‘a thunderbolt launched from an eggshell invisibly

tethered to a base'.[18] In the Falklands Campaign the eggshell was plain to see and all the more fragile for it.

LOGISTIC LESSONS

While the Falklands Campaign did not generate any startling logistic insights, it did provide a powerful demonstration that the performance of the support area is a key element in sustaining operations. It also served to reaffirm the importance of the key principles underpinning the RAF's engineering and supply organisation – flexibility and responsiveness. There were, of course, specific lessons, including:

The vital role of strategic and tactical airlift.
The importance of sustaining aircraft availability under surge conditions.
The high consumption of materiel, particularly fuel, during intensive air operations.
The value of deployable repair facilities and specialist support units.
The need for effective pipeline management of critical assets.
The essential contribution of industry in meeting UORs.
The value of peacetime training in sustaining an expeditionary capability.
The importance of deployable, reliable and secure communications.
The pivotal role of individuals – derived from high professional standards, shared values and a binding ethos. [19]

The Impact on the Logistic Community

But what of the impact on the wider logistic community? I believe it was profound, although this may just be a personal view.

Until 1982, the view at Swanton Morley, enshrined in the conduct of successive Tactical Evaluations, was that we had no role in war beyond the despatch of manpower to the frontline. The same might have been inferred for the wider support organisation. The reality of the Falklands Campaign was very different. It shook many of our preconceptions and demonstrated a demand for specialist skills, technical advice, resource modelling and contingency scaling and logistic support that was as overwhelming as it was unexpected. I recall several SNCOs, who, when asked to contribute to the planning effort for the garrison air component, became excited, if not tearful, at the prospect – after what they perceived to have been the long, frustrating and largely unfulfilled years of the

Cold War.

An emotional reaction perhaps, but genuine all the same. It is tempting to see this reflected across the whole engineering and supply community as a greater sense of self-confidence and maturity, which, married to improved processes and support capabilities, provided the essential foundation for logistic success in the Gulf War.

CONCLUSIONS

The Falklands Campaign tested every aspect of the RAF logistic organisation and tested it hard. Processes were found to be basically sound and the overall system sufficiently flexible and responsive. However, flexibility does not happen by accident 'it depends on the imagination and ingenuity of the men who are working the machines.….and to succeed they must be based on the equally essential qualities of determination and reliability.[20] There is little doubt that the enthusiasm and commitment of individual engineers, suppliers and movers made a telling contribution to the campaign's successful outcome. Little wonder that the House of Commons Defence Committee subsequently observed that 'the British Victory in the Falkland Islands was a tribute to the planning and hard work of all those involved in the logistic support to the Task Force.'[21]

Notes:

[1] Very little literature has been published on the logistic aspects of the Falklands Campaign, other than some early articles that focus almost exclusively on the sea and land campaigns. For example: Bruce Schoch, '*Logistics of the Falklands War'*, pages 2-7, *Army Logistician*, May-Jun 1986; '*Logistic Support for Operation Corporate'* by 'Supporter', pages 264-271, *Naval Review*, October 1982; Valerie Adams, '*Logistic Support for the Falklands Campaign*', pages 43-49, *RUSI Journal*, September 1984; and Matthew Klimow, '*British Logistics in the Falklands*', pages 155-162, *Combined Arms*, Fort Leavenworth, 1992.

[2] Narrative of RAF Operations During the Falklands Conflict, AHB(RAF), 1988.

[3] *Ibid*.

[4] St Athan's workload on the Sea Harrier and Victor was particularly heavy, while EWAU was closely involved in the provision and installation of long-range navigational equipment, RWR and special communications fits.

[5] This includes aircraft such as the Puma and the Canberra, that in the event were not deployed, or modifications, such as the carriage of Martel by the Vulcan, that were not taken forward.

[6] During Op GRANBY the RAF introduced over 300 modifications across twelve different aircraft types at a cost of £66M and 300,000 man hours: Sir Michael Alcock,

'*Supporting The Royal Air Force'*, *Aeronautical Journal*, Aug/Sep 83.
[7] Alfred Price, *Harrier At War*, (London, 1984), pages 104-107.
[8] During the period 2 April to 4 June 1982 Ascension Island handled a total of 10,600 helicopter and 2500 fixed-wing flights. The airlift moved some 7000 tons of ammunition, vehicles and other cargo as well as over 6500 passengers.
[9] Movements Presentation on Op CORPORATE, D/D Mov(RAF) 1/20 dated September 1982.
[10] Engines were given an anti-corrosion spray and sealed while pylons and undercarriages were liberally coated with PX28 before the entire aircraft was covered in a 'Driclad' plastic cover.
[11] Bryan Mason, *Servicing and Operating Shipborne Harrier GR3 during the Falklands Crisis*, ENG/GR3/MAS/1 dated Sep 82.
[12] The number of deployed TCW personnel reached nearly 120, providing essential support at Ascension Island and to 5 Brigade.
[13] The sole No 18 Sqn Chinook flew for 109 hrs without servicing, carrying 2150 troops, 550 prisoners and 550 tons of freight – in the absence of engineering documentation, tools or spares. Sir John Curtiss, '*The RAF Contribution to the Falklands Campaign'*, pages 24-32, *Naval Review*, Jan 83.
[14] The Victor tanker force had exceeded its annual flying task by the end of June.
[15] Bruce Watson & Peter Dunn, *Military Lessons of the Falklands Island War; Views from the United States*, (London, 1984), page 39. The Skyhawk seems to have suffered particularly badly in this regard. Spares shortages and maintenance problems reduced overall availability to some 66% (allowing for attrition) by the end of hostilities. Rodney Burden *et al*, *Falklands - The Air War,* (London, 1986), pages 39-43.
[16] This was the first of a succession of imaginatively titled deployable facilities such as the TESCO (TIALD Engineering Support Cabin Operation) and the SAINSBURI (Special Avionic Instrument Network System and Basic Unite Repair Installation) repair workshops employed in the Gulf War.
[17] *Falkland Islands Conflict Aircraft Battle Damage Repair*, 4STT/700/30/Trg dated 4 Feb 03 and Bryan Mason, *Battle Damage Repair – Harrier GR3*, BDR/GR3/MAS/1 dated 31 Aug 82.
[18] *Gulf War Air Power Survey, Vol III*, (Washington, 1993), page 391.
[19] The Official Report on the Falklands Campaign did not identify specific logistic lessons learned. These lessons reflect, therefore, my personal interpretation drawing on the AHB Narrative where possible. Secretary of State for Defence*, The Falklands Campaign: The Lessons*, HMSO, London, December 1982.
[20] Tony Mason, '*"Hay for the Hobby Horses": Reflections on the Air War in the South Atlantic, 1982*', pages 32-41, *RUSI Journal*, December 1982.
[21] House of Commons, *Implementing The Lessons Of The Falklands Campaign*, page lxxx, Fourth Report from the Defence Committee, Session 1986-87, HMSO, London.

HARRIER OPERATIONS - RAF GÜTERSLOH

Air Chief Marshal Sir Richard Johns

Commissioned from Cranwell in 1959, Sir Richard spent the next nine years flying Hunters and as a QFI on the Jet Provost and Gnat. In the 1970s and '80s he flew Harriers in Germany, first as OC 3 Sqn and then as Station Commander at Gütersloh, which also involved qualification on the Chinook and Puma. His senior appointments have included SASO at both HQ RAFG and HQ STC, AOC 1 Gp, COS and AOCinC STC and, within NATO, CinC Allied Force Northwestern Europe. In April 1997 Sir Richard became CAS. On his retirement in 2000 he was appointed by HM the Queen as Constable and Governor of Windsor Castle.

May I start with a health warning – a health warning that is particularly apposite when directed to the members of a distinguished historical society. It is that I kept no personal diary of RAF Gütersloh's contribution to the Falklands war and so what I have to say is dredged from the murky depths of my memory. But I suppose, rather immodestly, that any personal recollection that survives such immersion may have something to commend it.

First then a little bit of personal background. I was posted to Gütersloh in early 1982 as Station Commander and RAFG Harrier Force Commander. As the first ex-Harrier Squadron Commander selected for the job you can imagine my pride and pleasure in taking command of a declared force of thirty-six Harriers and fifty-two Harrier pilots – perhaps fifty-two too many in the probable opinion of the Brüggen Jaguar Wing.

By 1982 the concept of ops for the Harrier was well established and field proven. And we should perhaps here remind ourselves that, at that time, the geographical focus of the Cold War confrontation was in Central Europe and overlaid by the direct and mutual threat of an intercontinental nuclear exchange. At stake was national survival, territorial integrity and political ideology. And it was this single scenario which drove the strategy, structure, deployment and tactics of our armed forces.

So, no surprise that the focus of our operational attention at Gütersloh

was on the IGB and the forces of the Warsaw Pact, positioned little more than a stone's throw away to the east of us. And this focus was kept sharp through vigorous and regular examinations by AAFCE TACEVAL, both on and off base.

The seizure of the Falklands on 2 April 1982 was soon, however, to exercise an immediate and enduring influence on the RAFG Harrier Force. The first inkling of what was to come was the arrival of a signal from Rheindahlen in early April asking how many of my Harrier pilots had AD experience. Four admitted to having previously flown Lightnings and were immediately deployed to Yeovilton to convert on to the Sea Harrier and then to move on southwards soon thereafter.

Other pilots were sent back to the UK for trials flying activities aimed particularly at giving the Harrier an LGB capability. Further to this, I think towards the end of April, we were tasked to train up four combat teams of eight pilots each (in effect two teams from No 3 Sqn and two from No 4 Sqn) as reinforcements for the Task Force. No 4 Sqn was in the lead as, at the start of the war, No 3 Sqn was in Canada on Exercise MAPLE FLAG. The squadron recovered to the UK without the assistance of in-flight refuelling – probably the longest staging trip ever undertaken by the Harrier Force.

Even heavier involvement occurred in early May when No 63 Sqn, our Rapier SHORAD unit, recovering from a field deployment exercise on 7 May, was ordered to redeploy on 9 May to Southampton to join the 5 Brigade move to the Falklands. This was pretty breathtaking stuff, with neither the squadron's personnel, under the command of Sqn Ldr Ian Loughborough, nor indeed their families, having much time to gather their thoughts about supplies of cold weather clothing and Rapier spares – amongst many other things. But I recall very vividly the departure of the squadron on a Sunday morning in their Land Rovers, smack on time and in immaculate order. Saluting the squadron by way of farewell was certainly an emotional moment for me.

Meanwhile training of Harrier combat teams proceeded apace with detachments to Yeovilton for ski-jump and deck landing practice, DACT with Belgian Mirages in our local airspace, in-flight refuelling training and other disciplines I may have forgotten. The consequence of all this was that flying activity levels at Gütersloh went off the clock which started to cause considerable problems with the local German authorities – who, in any event, thought we were nuts to go to war over what they

Although the Harrier commitment to Op CORPORATE was focused on Wittering and No 1 Sqn, the effect on Gütersloh was considerable because it too contributed manpower (notably No 63 Sqn RAF Regiment) and other resources, including aeroplanes. This one belonged to No 4 Sqn, two of whose Harriers found their way to the South Atlantic.

viewed as a trivial affair. Thinking how to soothe them down did provoke me into one lonely and untypical brainwave. I invited the Command Secretary to send up one of his best accountants to the station to go through all our books to make an estimate of how much money RAF Gütersloh put into the local economy.

By the time he had finished his work all the local German political and government big wigs had been invited to a briefing which ostensibly was to tell them about our operations. The real purpose, however, was to make the point that their continuing bellyaching about our activities, when we were at war, was unbecoming of a NATO ally in whose country and within Stadt Gütersloh the station annually spent something in the region of 50M Deutschmarks through personal expenditure and a multitude of local contracts covering everything from rat-catching to laundries. I suggested mischievously, and not altogether believing myself, that should the British government decide that operations from Gütersloh were becoming untenable, our departure would leave a considerable hole in their corporate pocket. The message was received loud and clear and when next year the station was twice besieged by thousands of demonstrators protesting against the deployment of Pershing and cruise missiles, we enjoyed considerable help and support

from the regional authorities.

I have got ahead of myself so, to return to the summer of ’82, the station was faced with one other considerable problem. Despite my pleas, the request for a ‘down declaration’ of the Harrier Force (to reflect both the reality of force availability at Gütersloh and engineer its removal from the Part One TACEVAL roster) was refused by HQ RAFG. I don’t know why to this day, and of course the inevitable happened.

In late June, the hooter went for a no-notice Part One and a quick count showed that at Gütersloh, out of my fifty-two pilots only twenty-four were available – and this included eight new chaps on Nos 3 and 4 Sqn who were not yet combat-ready, the STANEVAL people and our three US exchange officers. Fortuitously, given the absence of several aeroplanes on the navalisation programme, we had to generate ‘only’ twenty-four aircraft in the anti-armour weapons fit. Even more fortuitously, the TACEVAL team chief was a Canadian Air Force colonel I knew well. In a quiet room in the FWOC we struck a deal that if I generated twenty-four aircraft within the stipulated twelve hours – and we were now also short of ground crews – and if I could put a pilot in each one of them for start up and taxi, he would call it quits and ask no questions. This we duly did. The RAF, and me too, are to this day indebted to Colonel Morrison. Others I knew at Ramstein at that time would have really enjoyed roasting us.

In a few minutes you are going to hear about the Harrier at war so may I fast forward to the aftermath of the conflict and recall four significant points.

First, it was abundantly clear that delivering lay down weapons, such as cluster bombs, from a pass distance (ie the height of the aircraft over the target) of 250 feet was just inviting trouble. To survive you had to go much lower and it was the Falklands experience that propelled us into the new era of operational low flying with the appropriate regular training programmes at home and, importantly, in Canada and the USA.

My second point concerns the worry in the staff corridors of HQ RAFG that returning aircrew, having tasted red meat, would become impatient at the constraints of peacetime flying in Germany. Nothing was further from the truth. Without exception, the pilots who came back to Gütersloh from the RN and from reinforcing No 1 Sqn, had enjoyed their full fill of excitement and I had no worries about their flying

discipline. What they did bring back, along with No 18 Sqn when they moved to Gütersloh from Odiham to form the RAFG SH Force with No 230 Sqn, was a quite invaluable insight into the challenges and pressures of contemporary conflict.

My third point concerns the dangers of inadequately trialled modifications, particularly when introduced to carry new weapons. Soon after the end of the war, a Harrier pilot on the first sortie of the day for a combat air patrol, switched on his armament master switches as he lined up on the runway at Port Stanley airfield. Because of incorrect positioning of other weapons switches in a dark corner of the cockpit, he immediately fired two AIM-9L missiles which caused the most awful injuries to a group of soldiers tasked for snow clearance duties at the end of the runway, and who had not pulled well clear of the take off strip. I remember this tragic event only too clearly because, several months later, I had to meet all the soldiers, mostly Guardsmen, at Pirbright to explain what had happened and to present the RAF's formal apologies. Their forgiveness of the pilot concerned reflected a quite exceptional generosity of spirit which was most humbling and which I shall never, never forget – and it makes one wonder what has happened since then to contemporary society both within and without the armed services.

To conclude with my final point, and on a lighter note, I well recall meeting on his return to Gütersloh one of the more senior Harrier pilots who delivered our first LGB's towards the end of the war. And who, incidentally, was one of the four brave chaps who flew direct from Ascension Island to join the Task Force with AAR support until their final cast off from the tankers. Thereafter, as they say, there was no turning back.

Anyway I asked him what was the single most important operational lesson he learnt during the war. Without hesitation he promptly replied 'never fly over the Scots Guards!'

Thinking back to prepare this short talk, I have been surprised by the clarity of my memories. There would be much more to say if time permitted, but my job is really to provide the warm up for what is to follow – and it is a marvellous story that, to this day, reflects the greatest credit on our Service and on the men who deployed south to recapture the Falkands Islands.

HARRIER OPERATIONS – No 1 Sqn

Air Chief Marshal Sir Peter Squire

Sir Peter was commissioned from Cranwell in 1966 and spent the early years of his career flying Hunters, both as a DFGA pilot and as a QFI. Converting to the Harrier in 1975, he commanded No 1 Sqn during Operation CORPORATE. Following command of the TTTE at Cottesmore, his senior appointments have included SASO HQ STC, AOC 38 and 1 Gps, ACAS, DCDS (Programmes and Personnel), AOCinC STC and CinC Allied Forces Northwestern Europe. He took up his current appointment as CAS in April 2000.

When news of the Argentinean invasion of the Falkland Islands was announced, No l(F) Sqn was deeply involved in preparing for a major exercise in Canada. The first question that came to everybody's mind was the inevitable, and somewhat ignorant, 'Where are the Falkland Islands?'. Having glanced at a map and seen the distances involved, it seemed to me that if we were to become embroiled as a squadron, the only reasonable place to be would be in reserve at Rio. As that seemed quite beyond the bounds of possibility, we got back to planning our Canadian exercise.

Having said that, and although based in the UK, No l(F) Sqn would always have deployed elsewhere in times of tension. At the time, it was declared to NATO as a reinforcement squadron with deployment options in all Regions of ACE. As such, the squadron had to be capable of autonomous operations from a 'bare base', albeit one that had been properly surveyed and to which we may have conducted exercise detachments.

On an operational deployment, therefore, the squadron's peacetime establishment was heavily supplemented by specialist sub-units (sappers, signallers, second-line engineering, caterers and RAF Regiment) to provide the essential support required to make such a concept feasible.

Because of this capability for bare base operations and the fact that No 1(F) Sqn was the only Harrier squadron qualified in air refuelling, it was not, therefore, altogether surprising that we should become involved in the campaign, although if anyone had told me in March 1982, when

we were actually operating well north of the Arctic Circle at Tromsö (in northern Norway) that within two months we would be fighting a war from an aircraft carrier some 8000 miles from home, I frankly would not have believed them.

A warning order issued on 8 April, told the squadron to prepare for operations from a carrier as attrition replacements for Sea Harrier combat losses.

Modification of the aircraft was the first major task. A number of navalisation modifications were required, including the fitting of shackles onto the outriggers for lashing-down, anti-corrosion treatment (especially for the engine, etc) and the fitting of specialist transponder equipment to assist recoveries to the carrier in bad weather. Now the Royal Air Force Harrier, at that time the GR3, had been bought as an attack aircraft, with only integral guns for self-defence. If we were to be used to replace Sea Harriers, a better air defence capability would be a high priority and so within a few days of receiving the initial warning order, both industry and the Service were working 24 hours a day in order to give the aircraft an air-to-air missile fit. Thanks to a great deal of effort and ingenuity, our aircraft were equipped with Sidewinder and the system proved and tested less than three weeks later.

Further modifications, which were later incorporated to increase the aircraft's capability, included the installation of a flare and chaff dispenser for self protection, an active electronic jammer to counter enemy radars, and the ability to carry and fire American ARMs. Whilst the modification programme was being carried out, nominated pilots went through an intensive work-up programme. This included realistic air combat training against French Mirage and Etendard aircraft, air-to-air missile firing (of which we had had no previous experience), operational weapon delivery profiles, ultra low flying and initiation into the Ski-Jump Club.

At the same time as we were given our warning order to prepare, work began to find a means of getting the reinforcement aircraft, which were due to include not only my GR3s but also additional Sea Harriers and helicopters, south to the TEZ. After a detailed inspection, it was decided that the container ship *Atlantic Conveyor* would provide the platform and the ship was rapidly adapted for its new role in Liverpool Docks.

The helicopters were loaded in the UK but the GR3s and Sea Harriers

Harriers at ASI en route Atlantic Conveyor.

were flown to Ascension, using in-flight refuelling. The GR3s were able to accomplish this 4000 mile leg in one hop, thus creating, at that time, new milestones in single-seat ferry flight times of over nine hours. Once at Ascension, the aircraft were flown onto the *Atlantic Conveyor* and tightly parked in the 'aircraft hide' which had been built between the walls of containers. They were then 'bagged' to give added protection against salt water.

With a total of fourteen Harriers and ten helicopters embarked this was a very valuable target and, during the passage south, one Sea Harrier was kept at a high state of readiness for air defence duties against the Argentinean Boeing 707. For the first few days, tanker support was also available to give the Sea Harrier additional radius of action. The very use of a container ship as a carrier of aircraft, let alone the ability to mount, albeit limited, operations from it, is a hallmark of the Harrier's enormous flexibility.

Having left Ascension on the evening of 7 May, the *Atlantic Conveyor*, in company with other ships of the Amphibious Group, made a rendezvous with the Task Force on 18 May and the Harriers were transferred to the two carriers, ten to *Hermes* and four to *Invincible*. All the GR3s went to *Hermes* and, after one day of work-up training, the squadron flew its first operational sortie on 20 May.

In the 2½ weeks between the arrival of the Task Force in the TEZ and our arrival, no Sea Harriers had been lost in air combat and so, instead of being replacements, the GR3s were used as reinforcements and, rightly,

No 1 Sqn's Harriers ranged on Hermes.

dedicated to the attack role. In this capacity we carried out the full gamut of offensive support missions, ranging from offensive counter-air to close air support and armed reconnaissance.

The aims of the offensive counter-air missions were twofold; first, to deny the use of Stanley airfield and the various outlying strips and, secondly, to destroy aircraft in the open. Low level laydown type deliveries were flown against a number of the airstrips, such as Goose Green, whilst against the runway at Stanley a great variety of profiles was used. Laydown attacks were successful in hitting the runway but, in the process, the aircraft were particularly vulnerable to the Argentinean air defences, and the resulting damage not very extensive. On the other hand, while high angle and loft deliveries kept aircraft out of range from ground defences, the accuracy of weapons delivery was poor. In this context it is worth recalling that because of the inability to align the INAS properly, all weaponeering was done using a fixed sight. Nevertheless, while the runway at Stanley remained open to Hercules and Pucara type aircraft, the Argentineans were not able to use the

airfield as a forward operating base for fighter-bombers and that was the Task Force's main concern. At the same time the Argentineans went to some lengths to deceive us, both by making the runway appear to be more extensively cratered than it was and by employing decoys. For instance, what initially appeared to be possible Etendards, turned out to have been 'Aermacchis' (MB339 trainer/light attack aircraft) standing on metal planking which had been deliberately arranged to simulate the shape of swept wing aircraft.

For its attack tasks, the GR3 carried and delivered a variety of weapons, including cluster bombs, 2-inch rockets, 1000 lb bombs and, in due course, the laser guided bomb. The cluster bomb had a marked effect against troops in defensive positions, both in terms of casualties and in the lowering of morale. This was particularly true in the battle for Goose Green where missions flown in close support of 2PARA had a significant effect on the outcome of that battle. It was also a highly effective weapon against storage areas, such as fuel, and against helicopters caught on the ground.

Regrettably, the full potential of the LGB could not be made use of until just one day before the ceasefire. It was not until then that the laser target markers were positioned at the right time and place. However, four bombs delivered from loft profiles that day achieved two direct hits on pin-point targets and served notice to the Argentineans that we now had a weapon of extreme accuracy; I have always believed that this may have been one of the factors that swayed the Argentinean decision to surrender so quickly.

The GR3 was capable of carrying a reconnaissance pod equipped with a fan of five cameras, giving horizon-to-horizon cover. Using this capability, and the organic processing facilities within *Hermes*, we were able to find concentrations of enemy defensive positions and other lucrative targets, notably, on one occasion a well camouflaged HQ bunker just west of Stanley and, on another, a line of more than twenty soft-skinned vehicles. Both of these targets were subsequently attacked although, in the latter case, it was too dark to be certain that the vehicles had not moved.

Shortly after the landings in San Carlos Water, a Harrier Forward Operating Base was built close to one of the settlements. It had metal taxiways and a short landing strip laid courtesy of the Royal Engineers. Refuelling facilities were available and up to four aircraft could be

The Harrier strip at San Carlos.

parked on the strip at any one time. As a rule, two GR3s were detached on a daily basis to provide quick reaction support for ground forces, whilst the Sea Harriers used it extensively in order to lengthen significantly their time on combat air patrol.

It would, however, be quite wrong to suggest that we had it all our own way. Indeed the loss of an aircraft on our second day of operations was a swift reminder that we were unlikely to come through unscathed. Experience quickly showed that the greatest threat was from ground-to-air weapons, which varied from surface-to-air missiles to small arms fire. The two major SAM systems were Roland and Tigercat, and we had a fair idea as to where these were located. We therefore planned to fly outside or below their respective engagement zones and, although a substantial number of both types of missile were launched at us, none was successful. The remaining SAM threat came from the shoulder-launched variety, Blowpipe and the Russian SAM-7, both of which were in plentiful supply. Again, our tactics of flying very low and fast seemed largely to negate this threat; indeed photographs taken on combat missions clearly showed soldiers carrying shoulder-launched SAMs but facing the wrong way because they had not been alerted in time to react to our very high-speed approach. That said, it is almost certain that the first of our aircraft to be shot down was engaged by Blowpipe.

The Argentineans were also equipped with a large quantity of AAA guns, ranging from 20mm to 35mm, some of which were linked to fire control radars. Although these tended to be sited in known areas, they posed a high threat to our aircraft, and indeed we lost a second aircraft during the attack on Goose Green.

The campaign was not without losses. This was XZ989 after it had suffered a loss of power on approach to the San Carlos strip.

However, what hit us most frequently was small arms fire and in the later stages of the campaign, when most missions took us close to Stanley, of every four aircraft launched one would return with holes in it. Apart from one aircraft which had a massive fuel leak and just failed to make it back to the carrier, all the others returned safely. This was very encouraging, as it had been thought that the aircraft might be somewhat vulnerable to battle damage. Not only did this prove to be incorrect but, once back on board, my engineers were able to effect some ingenious repairs and no aircraft spent longer than 48 hours in the hangar before it was flying again.

As a result of our losses, which by 8 June had totalled four (the fourth being a crash landing at the FOB) replacements were flown from Ascension to the Task Force using in-flight refuelling; long and apprehensive flights indeed for pilots who, without diversions *en route*, had 8½ hours to prepare for their first ever deck landing.

Following the ceasefire, a full site was built ashore at Port Stanley and on 4 July the GR3 Detachment went ashore, armed with Sidewinders in the air defence role. Despite atrocious conditions early on, this detachment remained at RAF Stanley until May 1985, when the purpose-built airfield at Mount Pleasant was opened. At that stage, the task of the Harriers was complete and their involvement in the Falklands was ended.

That has been a much abbreviated version of a presentation I gave frequently in the year or so immediately after the end of the Falklands War. I used also to make the point that we had clearly sent the wrong signals to Buenos Aires in the lead up to their invasion and that a similar

failure in deterrence in our East/West relations would carry a far heavier penalty. In the event, however, the Soviet Union would have noted the UK's unswerving determination to regain the islands – if not by diplomatic negotiation then by force, in spite of the risks – and, with it, our commitment to the principle of self-determination.

Now, twenty years later, what are some of the conclusions I draw?

As an aberration in Cold War terms, the Falklands War was very much the forerunner of today's Expeditionary Operations, with a strong Joint ingredient, even if the Services were not well prepared for such interaction.

That we can operate RAF combat squadrons from a maritime platform, either as a DOB or as the starting point prior to moving ashore. However, the carrier must be appropriately configured for offensive tasking which was by no means the case in 1982.

The combination of distance, and a lack of today's technology, made the Falklands the last occasion when military commanders had any real control over the media. Whilst I favour the embedding of correspondents into formed units, as the lesser of the evils, today's experience reveals quite clearly that the insatiable demand for dramatic news or pictures will have implications for the conduct of operations and the welfare of our families.

1982 saw the first use in conflict of smart weapons by the RAF, even if the method of delivery was somewhat Heath Robinson. In the twenty years that have elapsed since, we have seen the split between dumb and smart reverse. In 1991 the percentage of smart weapons used in the Gulf War was 10%, although those 10% produced about 80% of the effect on the ground. In Kosovo, the ratio was 60:40 in favour of smart and in the current conflict in Iraq the split is 90:10. Regardless of cost, smart precision weapons are the only way forward.

At the end of the day, it is the quality of the young men and women who fill our ranks that makes the difference. Well educated, well trained, well motivated and led, they provide the decision makers and the glue that holds the decision-making process together, as well as being the practitioners on the ground and the warriors in the air that get the very most out of the weapon systems they operate.

AFTERNOON DISCUSSION PERIOD

Sqn Ldr Peter Symes. I was living near Wyton in 1982 and it soon became apparent that No 39 Sqn was chiefly noticeable for its absence. Shortly after the war, one was aware of some Latin American types being entertained in the local pub and then some Canberra PR 9s appeared in the Chilean ORBAT. Is this aspect of the campaign still classified?

Sir Peter Squire. So far as I am aware, the PR 9s of No 39 Sqn were not involved in the Falklands.[1]

Sir Freddie Sowrey. It was said that modifying the Nimrod so that they could be refuelled in the air meant that a hose blocked the escape hatch and that it fell to a wing commander Nimrod captain to sell this drawback to his colleagues, who clearly accepted it. This was perhaps an instance of the practice, of which we have heard, of devolving decision making to the lowest possible level, of giving people who were very familiar with the parameters of their field of operations, the ability to get on with the job. With the increasing tendency towards centralisation, will we be able to retain this degree of flexibility in the future?

Sir Peter Squire. Perhaps I should try to answer that one, and then see whether any of my colleagues wish to take issue with me. This is a question that concerns us, and it does so on a number of levels but, I think that, if you were to ask it of the Commander of one of our deployed operating bases in the Gulf today, many of them would say that we haven't got it *wrong* by any means. In practical terms, they are being granted the level of authority that they need to do the job. That said, difficulties do tend to arise when they come home and find that they are obliged to re-adjust to the more rigid structures and procedures that prevail in the UK; that is when they can get a little frustrated at the relative lack of devolved authority. It is a problem that we are well aware of and one which we have been addressing, certainly since John Allison was running Strike Command. He set up a programme, which I sustained, as have those who have followed me, which aimed to

[1] No 39 Sqn was not awarded the South Atlantic 1982 Battle Honour which it surely would have been if it had participated actively in Operation CORPORATE. That said, the waters are a trifle muddied by the fact, at the time of writing, the RAF website does list No 39 Sqn in the RAF's Falklands ORBAT. **Ed**

deregulate wherever we could and thus pass authority further down the command chain.

A particular area that we are looking at is the relationship between junior officers and NCOs. Many of our warrant officers and SNCOs feel that they lack sufficient authority and we are looking to see whether it would be possible to cascade even further down the line, perhaps by replacing some junior officer posts with warrant officers or SNCOs. Unfortunately, this is not quite as straightforward as it seems, because, in some of our Branches, there are barely sufficient good junior officer appointments to breed the next generation of squadron leaders and wing commanders; if we give some of them to SNCOs we could well give ourselves another headache in a few years time.

So, from my perspective, devolution is something that works very well when we are operating in the field and actually doing the job, although it can still cause frustration when we are back at base. We continue to work at it, but we are probably not quite there yet. Perhaps Tony Stables has another view?

AVM Tony Stables. No, I haven't, but, in the context of SNCOs, I would offer an observation on the quality of my airmen aircrew. They had originally enlisted as 18 or 19 year-old sergeants and I found that the quality of leadership was almost totally lacking. In fact, when we came back to the UK I made two specific recommendations. The first was that airmen aircrew should probably be employed as corporals to begin with and that they should be required to earn promotion to sergeant, and the second, that they should be subject to an annual assessment or appraisal, which they weren't in those days. The assessment aspect was taken forward but the idea of starting out as corporals was not implemented, and I can, of course, appreciate the difficulties that the recruiters would have encountered in trying to sell the attractions of this option to the highly educated group of young people that we seek to attract to serve as aircrew. Nevertheless, the limitations of some of my airmen aircrew were very apparent. In fact, when we went ashore in the Falklands, the man I appointed to command the groundcrew element was the sergeant chef, because he had the most amazing qualities of leadership, far above those of my master aircrew, the warrant officers who worked for me. It was a very interesting lesson.

Mike Meech. We heard that one of the lessons taught by the Falklands

experience was that the Chinook demonstrated that it was the helicopter of choice, yet we seem to have overlooked this when it came to designing HMS *Ocean*. That ship was commissioned long after the Falklands but it is very difficult, perhaps impossible, to get a Chinook into its hangar deck. Should we not have seen that one coming?

Sir Peter Squire. Tony Stables will know the dimensions far better than me, but my guess is that it might be possible, just, to get the aircraft below deck with its rotors off. But you certainly couldn't do it with the rotors on and I doubt that even the Americans aim to put helicopters of that size below deck. Tony?

AVM Stables. I think that we simply elected to handle inter-theatre movement of Chinooks either as air freight, with the rotors derigged, or by equipping them for air-to-air refuelling to permit them to self-deploy, both of these options are, incidentally, also exercised by the American Army. That said, we have deployed Chinook by sea; in fact they went to Iraq on HMS *Ocean*, although they will have travelled as deck cargo. Once in the Gulf, they operated initially from *Ocean*, although they eventually moved ashore. Incidentally, having used it extensively in Afghanistan and now in Iraq, the Royal Marines have got a real taste for the Chinook and I think that we may well see some pressure to buy some more.

Gp Capt Jock Heron. Could I pursue one of Sir Richard Johns' points, about the MOD's failure to 'down declare' the Gütersloh Harrier Force – because I was one of the Staff Officers in Germany who sympathised (*Laughter*) ……..with the position. Gütersloh's problems were not confined to the shortage of aircraft and pilots, the ground support equipment was also being shipped out, along with the cabins that provided the command and control in the field. All of this was being reported to MOD by signal. We followed up by telephone, seeking reassurance that we were doing the right thing, but we never got a formal acknowledgement by signal. Is there anyone here who can shed any light, because Sir Richard and I would both *really* like to know why there was such an apparent lack of support from London. (*There was some more – embarrassed? – laughter, but no response*)

Sqn Ldr Graham Stagg. As SATCO at Leuchars in 1982, I was not personally involved in Operation CORPORATE, but my brother was a

Hercules captain operating out of Ascension Island. In our correspondence, he has had some rather scathing things to say about the inadequacy of the RWR equipment that was hastily provided and made some observations on the issue of drugs to aircrew. What did we learn from the use of Temazepam? Were there, for instance, any after effects? And does the panel have any comment on the fitting of appropriate radar warning receivers to aeroplanes that would normally operate in a passive role in wartime.

Sir Peter Squire. The issue of sleep management, in an era in which war is continued for 24 hours of the day, is extremely important, because you have got to get it right. You cannot have people flying continuously, day after day or night after night, without imposing some degree of sleep management and I think that the use of Temazepam in 1982 may have been one of the first forays into that particular aspect of managing the conduct of war. My understanding is that it went pretty well. I did not use it personally; we didn't need to in our particular role, but for the transport and tanker crews I think it was absolutely essential.

If you are going to employ drugs, however, it has to be under a properly structured programme; you cannot simply hand out pills for people to take whenever they feel like it. This does not necessarily mean close personal medical supervision, although medical advice is essential to both the implementation and the monitoring of the programme. Sir Richard may have something to say about the supervision of sleep patterns in the bunker at High Wycombe during the Gulf War but, under some circumstances, the case for the use of drugs is quite clear. Take, for example, the B-2s which operate out of the continental United States into a combat zone, like Afghanistan or Iraq, flying sorties in excess of 40 hour's duration with a crew of two. Now they have simply *got* to have a sleep management programme. I don't know exactly how they go about it, but they cannot possibly stay awake for the 48 hours required to do a round trip. Like it or not, if we are going to have to fight a 24 hour-a-day war, and we are, sleep management is going to be inevitable.

Sir Richard Johns. CAS is absolutely right about the need for a structured and controlled approach to the use of approved drugs. I think that the use of Temazepam during the Falklands War was pretty much a 'first try' but, based on this experience, the IAM subsequently did a great deal of research into this topic so that we knew a great deal more about it

by the time of the Gulf War. The PMO at Strike Command in 1990-91 was AVM Alan Johnson and he very quickly gave authority for the commanders of our deployed forces to issue Temazepam to all aircrew who were actively engaged. It really was necessary, because the campaign involved round-the-clock operations. For aircrew actually living on the airfields, as at Tabuk, the noise alone meant that it was very difficult to get to sleep and, while less acute, the problem was also apparent where people were accommodated off-base, as at Muharraq. We had much the same problem in the bunker at High Wycombe, because it too was being manned on a 24-hour basis. I was on shift myself from the week before the war began right through to the end. I used to go on duty at 10 o'clock at night and I would come off at 1 o'clock, lunchtime, the next day. Trying to get your head down at 3 pm in the afternoon so that you could get 6 hour's sleep before having to get up again at nine in the evening so that you were back in the bunker an hour later was simply impractical, particularly when it went on for eight consecutive weeks. I don't think that I could have survived that regime much longer without using Temazepam. I know that Alan Johnson was getting slightly worried after I had been taking it for two months but I had absolutely no side effects and, as soon as the war was over I stopped and resumed a normal working routine. I had absolutely no after effects; nor did I experience any difficulty in re-establishing a natural sleep pattern.

So, the use of selected drugs is well understood and the practice is now an accepted feature of 24-hour all-weather operations. So long as they are being taken under a properly structured and controlled programme, which has been approved and authorised by the appropriate medical authorities, it causes me no concern whatsoever. Indeed, the Air Transport Force, which currently includes my own son, routinely uses Temazepam when they go down route.

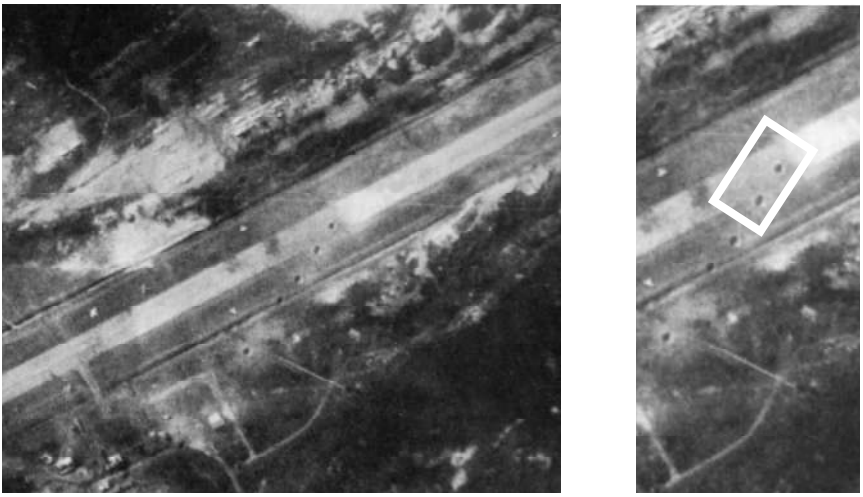
Sir Peter Squire. Regarding the second question, on the RWR, I think that, as a Service, we have, in the past, probably been guilty of investing most of our money in platforms; the acquisition of the weapons and systems needed for the operational role has tended to be something of a secondary consideration. I believe that we are now much better at doing this. I think the very effective combination of platforms and weapons that we have in our current front line are the result of learning from past

experience. In the specific case of the Hercules, for instance, we are installing proper defensive aid sub-systems into some of the aeroplanes; not all of them, but certainly those that we feel might have to go into harm's way. Similarly, apart from our transport aircraft, we have tankers equipped with defensive aids which permits them go into places like Kabul or to fly over Iraq with a substantial degree of self-protection.

Maj Gen Julian Thompson. I was Commander of the 3rd Commando Brigade in the Falklands. In his presentation, CAS said that his squadron helped to turn the tide at Goose Green. I can tell him that it *did* turn the tide. 2PARA were stuck on a forward slope, in daylight, being engaged by 35 mm AAA at 2000 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, for which I'd like to say thank you, very much indeed.

Sir Peter Squire. Well Julian, it is very kind of you to say so and I thank you for that. Perhaps I too could add an anecdote. One of the interesting things about the campaign that I learnt subsequently was that, during the action at Goose Green, when the overall tide was beginning to turn and the impact of air power was starting to became apparent, I understand that the CO of 2PARA actually told the Argentineans that he was going to lay on a firepower demonstration. He was planning to put four Harriers onto a nominated target, not to attack the enemy, but to demonstrate our ability to deliver a weight of weapons on any specified position. The message was to have been, 'We'll show you what we can do and, unless you surrender, we'll come and do it to you.' In the event, it never happened, but it was an interesting example of thinking about information, or even psychological, warfare.

Sir John Curtiss. I know that one of the members of our audience is Sqn Ldr Martin Withers who flew the first Vulcan sortie and I would like to offer him the opportunity to say a few words.



While the stick delivered by the first BLACK BUCK sortie resulted in an overshoot, there is no doubt that the first bomb did hit, and crater, the runway.

Sqn Ldr Martin Withers. I will be very brief, because Sir John said just about everything that needed to be said in his presentation. I would, however, like to be sure that everyone does get one message. We *did* hit the runway with that bomb! I have had that confirmed, both by the Royal Engineers who repaired the hole, and by the pilots of Phantoms who hit the lip of the repaired crater with their nosewheel on take-off! There really is no doubt that we hit the runway.

I don't really have anything else to add, apart, perhaps, from saying that, for all of us V-bomber types, Operation BLACK BUCK was something totally unexpected. We were prepared only for a nuclear exchange with Russia, which actually meant that we had led a very sheltered existence within an air force which wasn't used to going to war. We had, therefore, to adapt very quickly. We were just like so many of the other people that you have heard from today. It was a considerable culture shock and we all had to learn fast, but we did, and I think that we did it very effectively. (*Applause*)

Air Cdre Max Bacon. I would like to expand a little on Sir Freddie's question about retaining the flexibility to delegate authority. What we

haven't really covered is the mistakes that the Service made in converting itself, in terms of command and control, from a static organisation into a mobile one. Perhaps the Chairman could comment on the relationship between 18 Gp and Strike Command? We heard how Odiham suffered in 1982 from staff officers who didn't really understand what they were doing. Have we moved forward? Are we properly structured to discharge, in a joint force scenario, our present and future functions, whatever they may be – and they will certainly be different in the future?

Sir John Curtiss. Well, as I said this morning, we simply didn't have a Joint Headquarters and the need for one was clearly one of the major lessons taught by the campaign. The lesson was well learned and the result has been exercised extensively in the years since then. The lack of a joint organisation did sometimes put people in an extraordinarily difficult position and I am personally full of praise and admiration for my CinC at Strike Command and his Deputy, neither of whom interfered because I had been put in charge of the aircraft that were operating to Ascension and further south. All I ever got was co-operation, but I think that that was almost entirely to do with the way that the air force 'family' works; it was certainly not an ideal arrangement. Strike Command was actually in a very difficult position; they were obliged to supply the aeroplanes, and much else, but having done so, they didn't have much say in how they were to be employed. I was, therefore, very fortunate in that I was well supported, but not interfered with, by Command Headquarters and by all the AOCs concerned.

Sir Peter Squire. I was not here this morning, so I don't know what has already been said about the setting up of the Permanent Joint Headquarters (PJHQ), but the current relationship between that HQ, which has operational command of the forces allocated to it, and the supporting commands (Fleet at Northwood, Land at Wilton and Strike at High Wycombe) is extremely good. It *has* to be, because the PJHQ staff is a relatively small one and they simply could not do their job without the assistance and support that they get from the individual Services.

But, apart from changes to C2 arrangements, I think that we can see that there have been many changes within the air force over the last ten years or so. There has always been an element of 'jointery, within certain elements of the RAF. Clearly there was a Land/Air connection for the

Close Air Support and the Support Helicopter forces, and there was a Maritime/Air connection for Nimrod and Buccaneer. On the other hand, there were large sections of the air force which were almost exclusively single-Service oriented; one thinks, for instance, of the Vulcan Force, much of the Air Defence Force and the air-to-air refuellers. Similarly, large proportions of the Army and the Navy used to go about their business in virtual isolation.

Over the last ten years the RAF has totally changed its structure, its training and its entire approach to joint and expeditionary operations. If you were to go to any of our stations, say Leuchars, you could tell them to pack up and get ready to move to the Gulf and they would be on the road in 24 hours. Once they arrived at Prince Sultan Air Base, or wherever, they would be set up and ready to commence operations extremely quickly. It has taken quite a long time, and it has required a lot of investment to enable us to do that, but the result is that the air force has undergone a fundamental transformation.

At the beginning of March, I went out to the Gulf to visit all of our deployed operating bases (two in Kuwait; one in Bahrain; one in Saudi Arabia and one in the UAE) and returned via Cyprus. It was quite remarkable to see what our people had achieved in absolutely no time at all. Indeed, if you remember, at the beginning of February, apart from the handful of aeroplanes that we already had in the Gulf, we had been going to deploy the bulk of the British air component to Turkey. We changed our mind at the end of the first week in February, because we could see that the Turks were going to be difficult. By the end of the first week in March, we had 100 combat aeroplanes and 27 helicopters deployed, all of them in the Gulf. Within a month of taking the decision to swap locations, we were established in-theatre with all of the weapons that we needed to provide a full operational capability, and before we could do anything at all, of course, we had had to get the agreement of the host nations to accept us. All of that is an indication of the recent transformation in the RAF's capabilities.

Sqn Ldr Colin Richardson. Sir Peter, can you reassure me, Sir, that the latest marks of RAF Harriers are fully navalised, particularly in view of the fact that the Sea Harriers are shortly to be withdrawn?

Sir Peter Squire. That is correct, they are. The GR7 is fully navalised in order both to embark in, and to operate from, one of our CVSs. It has

been decided to take the Sea Harrier out of service, because we were going to have to spend a great deal of money to sustain it through to 2012 and it became a question of priorities; in the end we felt that the money would be better spent elsewhere. So from about 2006 the only fixed-wing aircraft which will be capable of embarking in the *Invincible* class carriers will be the GR7s and we will maintain that capability until the Joint Strike Fighter enters service with the two new big carriers in around 2012.

Air Mshl Sir Reginald Harland. Perhaps I could expand slightly on what CAS has just said about Harriers on carriers, and offer a comment in the general context of much else that we have talked about today. A long time ago I was the Project Officer for the Harrier, with responsibility for introducing it into service, which we did on time and within cost. We had been told, quite clearly, that the aircraft would never be used by the Navy. It was equally clear to me that that was ridiculous, so I made an arrangement with John Fozzard, the designer, that no magnesium would be used except for the wheel hubs, which could be changed very easily. My point is that it is critical that we look ahead to predict what *might* happen.

I subsequently attended the IDC where, as an exercise, we were required to forecast what forces we would need in ten years time. My syndicate elected to tackle the problem by drawing up a list of possible wars, what the nature of those wars might be and what incentives our Government might have to take part. Looking back, and comparing our forecast with what has actually happened since, I think that the only one that we missed was the Cod War with Iceland! We considered the Falklands a likely prospect but, with the forces available to us, we decided that it was not practical to put anything down there, so we considered that that problem would *have* to be solved diplomatically. I think that this sort of exercise is essential. We need to predict what might happen and what we could do about it in each case. Each Government then needs to be briefed on the position and, if they wish to expand their options, they need to understand the resource implications.

Sir Richard Johns. We have done precisely that. It was called the Strategic Defence Review and, yes, the Government was fully aware of the outcome. In fact they were kept in the picture throughout the whole debate, which took up two years of my life! I shall never, never forget it!

I think that, of all the defence reviews conducted by any Government since the war, it was probably the most open and the most honest. And I don't say that just because I was part of it, although I was actually there, participating and observing. I say it because I have a great deal of respect for the people who were involved, including the politicians.

Sir Peter Squire. I think that the Strategic Defence Review to which Sir Richard has referred, was so successful because it was built on a baseline paper which reflected foreign and security policy. That paper was jointly sponsored by the Foreign Office and the MOD and, although it was not formally endorsed by Cabinet, it was 'noted' by Cabinet and thus provided a valid basis for the subsequent planning assumptions, including scales of effort, the ability to recuperate, the *roulement* of people and so on. From this we were able to derive the constitution of the force structure, its component elements, the degrees of readiness that each one could maintain and for how long, the provision of strategic mobility and all of the other factors that go to make up our real defence capability. It was a very thorough, empirical exercise which was intended to define the front line forces needed to meet the demands of what we believed to be the future as far ahead, at the time, as 2015.

In effect, we determined that the UK has four key areas of interest in which it would be prepared to engage in operations. Clearly, one was Northern and Central Europe; the second was the Balkans; the third, the Middle East; and the fourth, the Mediterranean and the North African littoral. If we were required to do anything beyond those regions, we would do only what we could; the Armed Forces would not be resourced to deal with any crisis outside our specified areas of national interest. We have since reviewed those parameters in the light of the September 11th incident, and we have decided that the increased threat of international terrorism means that we now have to consider a wider geographical area; in fact we need to go as far east as perhaps Nepal and further south into Africa. As a result, we have more need for strategic lift and, in the fullness of time, I think that you will see that we will actually invest more in that capability in order to match the changed circumstances.

CLOSING REMARKS

by Marshal of the Royal Air Force Sir Michael Beetham

Sir Michael joined the RAFVR in 1941 and flew Lancasters on operations with No 50 Sqn. His post-war flying included further experience on Lancasters with Nos 57, 35 and 82 Sqns. He later commanded No 214 (Valiant) Sqn and RAF Khormaksar. His senior appointments included Directorships at the MOD, Commandant RAF Staff College, ACOS (Policy and Plans) at SHAPE, DCinC Strike Command, CinC RAFG Germany and COMTWOATAF. He became CAS in 1977 and remained in post for five years, which included supervision of the RAF's participation in Operation CORPORATE.

In opening his presentation on the Vulcan, when we resumed after lunch, the Chairman observed that he had drawn the graveyard slot. I am not sure what that makes mine at the end of the day! It has been a long day but, I am sure that you would all agree that it has been a most informative one in which many interesting points have been brought out.

There is an old adage that the war, or the crisis, that hits you will not be the one that you expected and that applies however many defence reviews or Strategic Defence Reviews are conducted. Operation CORPORATE certainly fell into that category. That said, the Chiefs of Staff do routinely review all overseas commitments but the Falklands were always assessed as being indefensible without major resources. Apart from the guardship and any available naval vessels, crucial to the defence of the islands was an extension of the runway at Port Stanley to permit the delivery of reinforcements if we ever had to go down there. But I am talking about 1981 remember, and we simply didn't have the necessary resources. In fact, we had just had a defence review and, no sooner had we finished it than the Government was asking us for further cuts. The upshot was that our NATO obligations had to be given absolute priority, and it was recognised that any external commitments would have to be funded at the expense of our NATO budget. The Government did understand this and the implications that it had for the Falklands; in short, that somehow they needed to get rid of them or to negotiate some sort of a deal with Argentina. Unfortunately, the

Argentineans gained the impression that we didn't really care about the islands, an impression gained in the course of some discussions that Nicholas Ridley and Richard Luce had with them in New York in the margins of the United Nations. Nevertheless, when, in the fullness of time, the Argentineans probed into South Georgia, this was not read in Whitehall as being a prelude to invasion.

Well, how wrong can you be? In spite of our assessment of the problems of defending the Falklands, the Prime Minister and the Government knew that they had to do something because, if they didn't, the Government might well fall. In the first instance, everyone hoped that the negotiations which Al Haig was conducting, shuttling to and fro between Buenos Aires, Washington and London, would be successful. But we felt that we still had to show that we were determined not to accept the invasion. The Navy, who had been deeply wounded by the defence review, said immediately, and before there had been any discussions between the Chiefs of Staff, that they could assemble and deploy a Task Force. Frankly, they hadn't really thought through all of the implications of what that involved. At the time, however, it would have been very difficult to object because publicly stating that you were assembling a Task Force represented a deterrent, and it was just possible that that alone might have done the trick. On that basis, we actually publicised the fact that we were converting the Vulcan to the conventional role, that we were mobilising Harriers and that we were building up the air-to-air refuelling force. It was all part of the deterrent posture. We told the Press; we told everyone, in the hope that the message would get through and that it would reinforce Haig's efforts. Sadly, it was to no avail and we had no option but to follow through.

Since we had long concluded that, in military terms, the Falklands were not defendable without major resources, we have to ask why it was that we succeeded in regaining them. The Falklands are about 400 miles from the mainland, which was fortunate for us, because this was at the extreme of the Argentinean Air Force's operating range. If it had been 300 miles I don't think that we could have pulled it off. We were also fortunate in that we had Ascension Island as a mounting base. As was made very clear this morning, the key to the use of Ascension was the support provided by the Americans who, apart from operating the airfield, extended assistance in many other ways, most significantly in the provision of fuel, of which we needed considerable quantities.

Clearly, if you are going to operate at extreme ranges, with or without the fixed-wing aircraft carriers that we talked about this afternoon, you are going to be critically dependent upon air-to-air refuelling. The whole enterprise was a real test of the flexibility of air power.

Looking back from my contemporary vantage point in Whitehall, what were the particular highlights that struck me? Number one was undoubtedly the performance of the fleet of Victor tankers. They were absolutely superb in the service that they provided. Then there was the adaptability of the receivers, the Vulcan (and we have only really touched on Vulcan operations), the Hercules, the Nimrod, the Harrier, all converted, very, very quickly – and not only the aircraft because, in most cases, we also had to convert the crews. I think that that was a quite remarkable achievement. Then again, there was the support provided by our groundcrew, air force wide. They did the most superb job, devising (apart from the hard work and long hours that they put in) imaginative solutions to technical problems and designing modifications to the aircraft to expand their operational capabilities.

And then there was the support that we got from industry, another aspect that we have already discussed, not least with regard to the way in which the procurement process was speeded up. In essence, of course, it was all about money. Once the financial constraints had been removed all of the committees became redundant and could be swept aside. Thereafter, if we needed anything, we got it and that enabled us actually to acquire a lot of capabilities that had long since been planned, most of which were very unlikely ever to have been realised. I recall, for example, that the provision air-to-air refuelling for the Nimrod had been in the programme for some time, but it was going to cost, I think, £30M, which was quite a lot of money in the 1980s, and take three years to implement. We just didn't have the money, but, once the gloves were off, we actually did it in about three weeks. At the end of the war, I asked the Permanent Under-Secretary to let me know how much that modification had actually cost. I never got an answer, but I doubt that it was £30M; you just couldn't have spent that much in such a short time in those days.

I could go on; I should, for instance, note the adaptability of our planners. We were talking about contingency planning towards the end of our afternoon discussion. The fact is that there simply was no plan for the Falklands but, paradoxically, I believe that that may actually have

worked to our advantage. When you do have a plan, events never run quite as expected so you are constantly having to amend it, while trying to stick as closely as possible to the original concept. Since there was no plan to follow in this case, it all had to be done *ad hoc*, which, if nothing else, gave us considerable scope for freedom of action. We made mistakes, of course, but everybody was trying to achieve the same thing and I think that, as Sir John Curtiss was saying, the relationship between the staffs at the Ministry, and at Command level, generally worked extremely smoothly.

Problem areas? I think the first that I would highlight would be our poor Intelligence. All of our Intelligence resources had been focused on NATO, on the Cold War and the Russian threat. As a result, our coverage of Latin America really was abysmal, and it never really recovered. The Intelligence briefings we used to get in the MOD were sadly deficient in many areas.

Another deficiency, for which we had to rely on the Task Force, was air reconnaissance. After the first Vulcan raid, for example, we needed to know precisely what had been achieved. We kept asking for photographs but they never materialised. I can, of course, understand that the Task Force Commander was anxious to preserve his Harriers and thus, perhaps, reluctant to use them for photography. But we really did need those pictures. Perhaps this was a symptom of a general lack of naval understanding of some aspects of air power. With all due respect to the Navy, I don't think that many of them had a very sound appreciation of the ability of aircraft to sink their surface ships. I have already referred to that crucial 400 mile-range factor; we were constantly urging the fleet to stay a little further to the east but they would sometimes stray closer to the islands in their anxiety to get at the enemy which we felt, in Whitehall, was taking an unnecessary risk.

One last point, one which CAS raised and which was referred to in Ron Dick's paper -– Public Relations. We had all sorts of armchair experts on the television, telling us what our plans were, what our options were for invasion and so on. We didn't actually have too many options but, all the same, it was very frustrating to have to sit and watch some retired senior officer pontificating on what we were likely to do next. When there aren't many options, this sort of thing can be far too accurate for comfort. I just hope that the Argentineans weren't watching, but they probably were. While it was difficult for us to control the flow

of information in 1982, advances in technology since then have made the situation even more difficult today – as we are currently seeing in Iraq. I suspect that, in some respects, the Press may now be even better at gathering some kinds of information than the military. It is a problem; I will say no more.

So, to sum up. We were lucky. But you do need luck in war and, if you take a calculated risk, I think that you probably deserve it. There is no question in my mind that the attempt to recover the Falklands was never going to be anything but *very* hazardous. It was undoubtedly a calculated risk, but it did come off and what made the difference was the skill and the determination shown by everyone involved, in all three Services.

Sir Michael at Wideawake in June 1982.

ROYAL AUXILIARY AIR FORCE NATIONAL MEMORIAL

In October 2004 the Royal Auxiliary Air Force (RAuxAF) will commemorate the 80th anniversary of its formation. As part of the celebrations, a memorial, to be dedicated to all past and present auxiliary personnel, is to be commissioned at the National Memorial Arboretum at Alrewas, Staffs.

The Auxiliary Air Force (AAF), as it was originally known, contributed twenty squadrons to the air force of the inter-war years. Fourteen of them subsequently fought in the Battle of Britain and all twenty went on to play a full part in WW II, operating in a wide variety of roles at home and abroad until 1945. The AAF was re-formed in 1946 and given its 'Royal' prefix a year later. During the early post-war era the RAuxAF comprised more than twenty flying squadrons and numerous other units until its virtual disbandment in 1957. It has been revived in recent years and its personnel have seen a great deal of campaign service, most notably in the Gulf in 1991, subsequently in Kosovo and currently in Iraq.

Apart from its flying squadrons, including air observation post units, at one time or another the RAuxAF has fielded balloon squadrons, fighter control, radar reporting and maritime headquarters units and Regiment squadrons, as well as the units which make up the present day organisation, 133 contingents in all. It is hoped that many of the current units and their associations, and those of elements which have been disbanded, will wish to contribute towards the memorial, or indeed, be represented at its dedication in September 2004.

The secretary of the Memorial Fund Committee would like to hear from all such association secretaries or from interested individuals who should contact:

Sqn Ldr F A Freeman RAuxAF (Retd), Cheyne Cottage, Tynron, Thornhill, DG3 4LA. Tel 01848 200150; email tnyfreem@aol.com

FEEDBACK

The Municipal Liaison Scheme.

In the Editor's article on the Municipal Liaison Scheme in Journal 29 he listed the known participating affiliations and suggested that there were no survivors of the scheme. In point of fact, there was one significant omission from the list and, oddly enough, that particular link is still active. No 201 Sqn was affiliated to Guernsey in 1939, gifts being exchanged between the squadron and the island to mark the occasion. In return, the States of Guernsey commissioned two large silver cups, one for the officers, the other for the WOs, SNCOs and airmen. Unfortunately, the Germans arrived before these trophies could be presented so they were buried for 'safe keeping' and formally handed over after the war.

When the squadron was disbanded, with the demise of the Sunderland in 1956, the affiliation, which had flourished until then, lapsed until 1970. At that time I was the CO of 201 and the squadron re-established, what have developed into, very strong links with the island and its people. For instance, the squadron's original standard is laid up in the church at St Peter Port; the unit received the Freedom of The States in 1994; and the new No 201 Sqn Museum in Castle Cornet was opened by HM The Queen on 12 July 2001. The Kinloss-based unit is plainly very proud to be No 201 (Guernsey's Own) Sqn, this association being reinforced every year during *Wings Week* when the standard, escorted by a detachment with fixed bayonets, is paraded through St Peter Port.

AVM George Chesworth
Forres

Theft of an Aeroplane from No 15 EFTS.

Members will recall that on page 191 of our last publication (Reserves and Auxiliaries) I enquired whether anyone could corroborate the tale of German PoWs stealing one of HM's aeroplanes in an attempt to make good an escape. I am indebted to Sqn Ldr Leonard Dickson who drew my attention to the fact that, coincidentally(?), within a fortnight someone had submitted a very similar question to the *Daily Mail*. The newspaper's researchers were able both to confirm that the incident did take place and provide a little more detail. Even more detail was provided by Roy Nesbit who had described this exploit in considerable

depth in his *Failed to Return* (Patrick Stephens; 1988). What follows is a much condensed version of that account.

Wearing mocked-up uniforms and carrying forged papers that identified them as Dutchmen, *Ltn* Heinz Schnabel and *Oblt* Harry Wappler escaped from Camp 15 (the erstwhile Shap Wells Hotel, near Penrith) on 24 November 1941 (not 1942 as I had it). They reached Carlisle by stowing away on a train and made their way from there to No 15 EFTS's aerodrome at Kingstown. Arriving at night with a bunch of personnel wending their way back to camp from the cinema, they were admitted with only a cursory challenge. Having laid low, they walked to the flight line after the initial flurry of morning activity had died down and approached a mechanic working on one of the Magisters (R1967) that had not taken off and easily persuaded him to help start it up for 'a taxying test'. This is not quite as surprising as it might seem, because the unit routinely trained Polish pilots so guards and groundcrew alike would have been quite accustomed to dealing with foreigners having a relatively limited command of English. Nevertheless, the alarm was raised shortly after the aeroplane actually took off.

The fugitives were over the North Sea before being reluctantly forced to accept that they lacked the fuel to reach Holland. Forced to turn back, they put down near Great Yarmouth. Their cover held up for a while yet and they were taking a bath in the Officers Mess at Horsham St Faith when the penny finally dropped. They were promptly arrested and returned to Camp 15 where they were sentenced to 28 day's solitary confinement. That was the nearest that any *Luftwaffe* personnel ever got to escaping successfully from the UK; Franz von Werra, the famous 'One That Got Away', began his home run in Canada.

Ed

TESTIMONY FILMS

Testimony Films is a TV production company which is preparing, for transmission in 2005, a six-part documentary for HTV to be called *The West At War*. They are seeking Servicemen and Women who came from the Gloucestershire–Wiltshire–Somerset region who would be prepared to share their global wartime experiences and/or veterans who served in that area and have an interesting local tale to tell. If you are interested, contact Clair Titley at Testimony Films, 12 Great George St, Bristol, BS1 5RS or via clair@testimonyfilms.force9.co.uk

BOOK REVIEWS

Footprints on the Sands of Time by Oliver Clutton-Brock. Grub Street; 2003. £35.

If the RAFHS were in the habit of nominating a 'book of the month', this would probably have to be it. Its concise sub-title, *RAF Bomber Command Prisoners of War in Germany 1939-45*, tells you what the book is about but conveys little impression of the remarkable breadth and depth of its content. The first point to make is that this is a *big* book, 548 pages, weighing in at 1.2 Kgs (that's 2 lbs 10 oz in real money), and more than half of the content is in a very small typeface, probably 8 point, so there is absolutely no shortage of information. The first half of the book provides a wide-ranging examination of the subject. The first twelve chapters provide a narrative account of events, and of the significant personalities involved in them, at each of the camps at which airmen were incarcerated. The remaining six cover more general topics, including wartime repatriations, Operation EXODUS, traitors and collaborators, and war crimes. Appendices provide notes on ancillary topics, such as Red Cross parcels, the Nazi propaganda campaign directed against airmen and the various Nazi security organisations. In addition there is a chronological summary of key dates, specifically recording major movements of RAF prisoners, and a series of statistical analyses which present Bomber Command's PoWs with entering arguments of month, aircraft type, squadron, rank, nationality or target. The endpapers provide maps showing the locations of all of the camps covered by the book (including those not actually dedicated to airmen but used by them). A representative selection of camp site plans is also provided and there is the customary Grub Street-style insert containing more than seventy photographs, many of them of surprisingly good quality considering the conditions under which some must have been taken. Finally, there is the core of the book, a listing of some 11,000 individuals tabulating their names, ranks and nationalities and noting the squadron, target and aircraft type and serial number on the date on which each one was lost, plus his PoW Number, the camps in which he was kept and any relevant remarks; all of which occupies some 210 pages.

So much for the facts and figures, what of the style? How does it read? The literature on PoWs is surprisingly extensive, indeed the bibliography in this book runs to some five-and-a-half pages. Many of

these titles tell of the personal experiences of individuals and/or provide accounts of particular happenings or of specific places. As a result, the author assumes that most readers will be familiar with 'the Wooden Horse', 'the Great Escape', the exploits of the habitual absconders who were consigned to Colditz and the like. For completeness, he does deal with all of these topics but set within the overall context and eschewing the hyperbole that tends to characterise a more focused account. The fact that he condenses some of the more familiar stories does not mean that the book is impersonal; indeed it is liberally punctuated with the recollections of ex-prisoners drawn from a wide variety of sources (other published works, PRO[1] files dealing with the debriefing of PoWs, the records of post-war trials and so on) which are invariably identified in the extensive endnotes to each chapter. Nor does the brevity afforded to some of the better known tales mean that the book is shallow. Quite the contrary, because many of the stories that emerge are being publicised for the first time, thus providing a really comprehensive impression of what it meant to be imprisoned in Germany half-a-century ago. It is all here: the way in which the treatment of PoWs deteriorated as the war progressed; the betrayal of the *Comète* line; the story of the airmen who spent two terrible months at Buchenwald and practically everything else that one could possibly want to know. The author's syntax is immaculate and his objectivity is demonstrated by his pulling no punches over the rough justice meted out to some Germans in the immediate aftermath of the war.

To sum up, this book is an admirable blend of academically, almost clinically, presented facts fleshed out by extensive personal extracts; my lasting impression is of having read a comprehensive, exhaustively researched, and thus authoritative, work. Oliver Clutton-Brock is to be congratulated on both his industry and his presentation. Grub Street are also to be commended for taking on this project and thus providing us with a mine of information that would otherwise have remained relatively inaccessible. When the size of this tome is taken into account, it is very reasonably priced and such enterprise deserves to succeed. That

[1] Having been the Public Record Office since 1838, someone has decided that it would be a good idea to merge it with the Historical Manuscripts Commission (of 1869) to create what we are now obliged to call the National Archive. Time will tell whether this was a useful rationalisation or a pointless re-branding exercise. Just in case I accidentally happen to overlook it in future, any reference to the PRO should read NA. **Ed**

said, this title may be a little too esoteric for the general reader – if you do not feel inclined to acquire a personal copy, I do urge you to press your local library to invest in one.

CGJ

The Bristol Blenheim by Graham Warner. Crécy; 2002. £34.99.

It is, of course, a contradiction in terms to have two 'books of the month' but, in view of the frequency with which we publish reviews, I think that we can afford to award the accolade twice. My second nomination is Graham Warner's opus. Even bigger than the PoW book, this one runs to 640 pages and weighs in at a hefty 4½ lbs; lavishly illustrated, it boasts about 550 photographs, many of them being published for the first time, not to mention a couple of dozen excellent profile paintings showing various colour schemes. In case anyone doesn't know, Graham Warner is the chap who spent twelve years restoring a Blenheim to airworthy condition only to have it broken within less than a month. Undaunted, he simply did it again, the result being the one that flew from Duxford until last August when someone bent that one. In pursuing these projects it was inevitable that Warner would finish up knowing just about everything that there is to know about the Blenheim and this book presents much of this information in an easily assimilated format.

There are one or two rough edges that could have been smoothed off, eg Mendini (for Menidi), Hanian (for Hainan) Island, Jahore (for Johore), Harris' predecessor at Bomber Command was Sir Richard Pierse (not Pierce), No 205 Sqn's Catalina Is were not amphibians, Trenchard's successor as GOC RFC was John Salmond, not Cyril Newall, and there is some evident uncertainty over the presentation of the designations of German aeroplanes and of the use of Roman and Arabic numerals when identifying *Luftwaffe* units (it does make a difference). While these occasional oversights may prompt the odd double-take, there are not many of them, considering the size of the book, and those that do crop up are incidental to the central theme.

So, having disposed of the superficial cons, what of the pros? The sub-title of the book is *A Complete History* and that is not an unreasonable claim. The full story of the technical development of the Blenheim is told in considerable detail, from its genesis, in the shape of the Northcliffe-funded *Britain First* project, through the subsequent

extrapolation of that design to create the remarkable Blenheim I and the definitive, if, by then, rather less remarkable, Mk IV, the breed coming to an inglorious end with the overdeveloped and woefully inadequate Mk V. All of this is set in the context of contemporary political considerations and, ultimately, military imperatives. While the central theme may be relatively familiar, I am sure that there will be fresh insights here for practically every reader and few will know of all of the obscure development programmes that were conducted, with armament for instance.

The prototype of 1936 could easily outrun a He 51 and handling notes for the Mk I provided the recommended figures for all of the standard aerobatic manoeuvres, including 'rolls off the top'. But this was no longer sufficient when faced by the Bf 109 only four years later. Already outperformed, outgunned and obsolescent when war broke out, the Blenheim was bound to take heavy losses, and it did. The bulk of Warner's book is an account of Blenheim operations. As I have observed before, operational histories can be difficult to digest because they are essentially a relentlessly repetitive series of very similar facts. This book is no exception and if you try to read it at a sitting your eyes will probably start to glaze over. Fortunately, the author has presented the information in numerous chapters which break the story up into convenient chunks, chronologically by theatre, making it far more user friendly.

The narrative creates two lasting impressions. First, the appalling wastage rate in terms of machines, both operationally and through accidents. Perhaps unsurprisingly, the first batches of pre-war Blenheims were written off with almost gay abandon by pilots familiar with Tiger Moths and Hinds who were bemused by (or forgot about) variable pitch propellers, hydraulic brakes, flaps and undercarriages, not to mention the problems of asymmetric flight. But little seemed to change and we are told that during the first four months of the war some sixty Blenheims were lost through accidents, three times as many as on operations. The pattern stayed much the same thereafter and the figures are validated by the provision at the end of each chapter of detailed lists of the aeroplanes that had been lost on operations and otherwise – date, serial number, nature and location of the incident and, where available, the identities and fate of the crew.

The second lasting impression is of the astonishing bravery of the

men involved and this shines through the remorselessly depressing accounts of the aeroplanes that failed to return. Apart from being obliged to fly an increasingly outmoded aeroplane, they were expected to do it in the most hazardous of operational circumstances. We are frequently reminded of the losses sustained in the course of Bomber Command's night offensive but the losses borne during 1940-41 by the Blenheim crews of No 2 Gp operating over France, and against shipping in the North Sea and the waters around Malta were just as heavy, as were those experienced by squadrons based in North Africa, Greece and the Far East. It was not unknown for units operating under field conditions in these overseas theatres to fight themselves to a standstill, eventually running out of aeroplanes or crews, or both, sometimes in the course of a single mission. Yet, once the squadron had been rebuilt, the replacements would doggedly do it all over again.

There was nothing fundamentally wrong with the Blenheim, it was simply out of date. It was also the aeroplane with which much of the RAF was equipped for the first three years of the war, three years that were characterised by defeat, rather than victory. As a result, we tend to remember the war-winning Spitfires, Lancasters, Typhoons and Mosquitos, while the Blenheim has become the 'Forgotten Bomber'. Graham Warner's admirably comprehensive and authoritative book puts the record straight. Highly recommended.

CGJ

Venom by David Watkins. Sutton; 2003. £25.

Sub-titled as the complete history of the de Havilland Venom and Sea Venom, David Watkins' nicely presented and amply illustrated book (I made it about 175 photographs and drawings) lives up to its billing. The content is everything that one would expect. There is a comprehensive account of the type's genesis and of the early trials and tribulations suffered by both the single- and two-seat variants. This is followed by chapters describing the use of the Venom, ashore and afloat, by its several operators. Most of this space is devoted to the RAF and FAA but there is good coverage of its employment by the air forces or navies of Australia, Iraq, France, Sweden, Venezuela and Switzerland.

The Venom was never intended to be more than an interim type to bridge the gap between the first generation Vampire and Meteor and the much higher performance era represented by the Hunter, Swift and

Javelin. As such, they were not built to last and their front-line service with the British forces amounted to little more than eight years, (although the prudent Swiss got far more than their money's worth as they kept some going into the 1980s). That being the case, I was surprised to read the author's assertion that the Venom flew more ground attack sorties than any other British type since WW II. On reflection, however, I think that he is probably right, as the years 1952-60 saw a great deal of action in Arabia and Malaya, not to mention the Suez affair, and all of these campaigns are amply covered. As is usual with such histories, the narrative is enlivened by first-hand accounts contributed by pilots who actually flew the type.

I found very little to criticise. On pages 128 and 165, the author appears to be a trifle confused by the alternative designations of the radar fitted to some of the two-seat variants, the American AN/APS-57 which the British restyled as AI Mk 21, although he does gets it right elsewhere. The caption to a series of pictures of an early French-built Sea Venom identifies it as an Aquilon 201, although it is fitted with a sliding cockpit canopy which, as the text makes clear, means that it is actually a model 202. References to a couple of units at Valley are slightly off the beam in that it is inappropriate to include the figure 1 in the titles of '1 Guided Weapons Development Squadron' and '1 Guided Weapons Trials Squadron', since neither unit had a numerical designation (and the T in GWTS actually stood for Training, rather than Trials). But this is all pretty arcane stuff and I am clearly having to dig deep to find anything to carp about and, on the plus side, the writer does have an easy style, making the book a pleasant read. Recommended, especially for Venom vets.

CGJ

Eyes of the RAF by Roy Conyers Nesbit. Sutton; 2003. £12.99.

First published in 1996, *Eyes of the RAF* has recently reappeared as a softback. Written at the request of the Association of RAF Photography Officers, it is a substantial account of the evolution of photographic reconnaissance going right back to the days of pre-WW I balloons. The book is lavishly illustrated with very well reproduced pictures of representative cameras, photographic equipment, aeroplanes, people and, of course, examples of airborne photography. The narrative is a little strange in that the last quarter of the book, which covers the post-war

years, is presented very differently from that which has gone before. The early chapters tell of the development of techniques and equipment, the term 'reconnaissance' being interpreted quite broadly, allowing for the inclusion of an interesting account of the trials and tribulations involved in devising a means of permitting the heavy bombers of WW II to take satisfactory strike photographs at night. As to personalities, the predictable list of prominent PR pilots (Cotton, Warburton, Proctor, Tuttle *et al*) are all given their due but this book also records the names of many others and pays just as much attention: to the previously largely anonymous experts who overcame the many technical problems that were encountered; to some of the more notable photographic interpreters; to the airmen who became *de facto* aircrew as airborne photographers; and to the tradesmen who processed miles of film under field conditions that were far from ideal, ranging from the sweltering heat of West Africa to the mud of the Italian winter of 1943-44. A name that frequently crops up is that of the 'Father of RAF Photography', Victor Laws, and it is good to see his contribution being given the wider recognition that it deserves, although he was definitely not (as the author states) still the sole NCO authorised to wear an observers badge at the time of his commissioning in November 1915.

Curiously, Chapters 13-16 read as if they belong to a quite different book, and a far less satisfying one. Rather than telling us more about cameras, photographic personalities and reconnaissance activities, the author provides what amounts to a potted history of RAF operations since 1945, with only occasional specific references to photography. Furthermore, some of these references are somewhat overstated, representing, perhaps, an attempt to compensate for the RAF's steadily contracting capabilities in this field. For instance, although, no mention was made of the activities of any of the sixteen wartime AOP squadrons in the first part of the book, it was deemed necessary to include the reconnaissance work done by Austers in post-war Malaya. Similarly, No 27 Sqn's maritime reconnaissance Vulcans are credited with a 'mapping' capability and a statement to the effect that UK-based SAR Whirlwinds and Wessex 'could also be used for photo-reconnaissance' smacks of scraping the barrel. Then again, while it is nice to have photographs of aeroplanes like the Sycamore, Hercules and Belvedere one is a little surprised to see them in a book that is nominally about RAF photo-reconnaissance – and justifying the inclusion of a Wessex belonging to

the RN requires an even greater stretch of the imagination. These aeroplanes are featured because they can easily be related to the content of the latter part of the book which is such a generalised account that almost anything goes, resulting in a considerable loss of both contrast and focus compared to the first twelve chapters.

Apart from an appendix dealing with the recently solved mystery of the fate of Adrian Warburton, the content of this new edition is almost identical to that of the original; one or two errors have been corrected but a lot of others have been left undisturbed. There are, for instance, many misspelled place names, among them Houges (for Hinges), Mauberge (for Maubeuge), Serrit (for Serris), Pezearches (for Pézarches); Sulva (for Suvla) Bay, Belleroy (for Balleroy); Gilze Rizen (for Rijen), Anacosta (for Anacostia) and so on. There are a number of other oddities too, eg the A-36 variant of the Mustang was not a two-seater; the 'Auster' in the photograph on page 178 is a Stinson L-5; the Canberras illustrated on page 256 belonged to No 58 (not 59) Sqn; No 81 Sqn flew Meteor 10s (not 9s); Shackletons were not equipped with MAD and AEW stands for Airborne (not Advanced) Early Warning – especially not in the context of the Shackleton Mk 2. None of these are critical, of course, but they do rather spoil the overall effect and it is a shame that the publishers missed the opportunity to give the text a final polish before relaunching this book.

That said, and notwithstanding my specific criticisms, this *is* a good book, especially the first twelve chapters. It is good to have it available again and the more than 350 excellent photographs that it contains are alone well worth the price.

CGJ

Targeting the Reich by Dr Alfred Price. Greenhill; 2003. £18.95.

The basis of Dr Price's latest book is the wartime Royal Air Force journal *Evidence in Camera* which used to publish selected intelligence product in the form of visual imagery – or, what we used call, photographs. Computer enhancement techniques have made it possible to reproduce a selection of these pictures with little or no loss of definition, and a very interesting collection they make.

The book opens with an account of the evolution of the RAF's photographic reconnaissance capabilities in European skies during WW II. While mention is made of the Mosquito and the nocturnal

activities of the Wellington, in the main, the theme reflects the development of the various PR versions of the Spitfire, culminating in the Mk XIX of late-1944 which could take pictures from altitudes in excess of 40,000 feet of objectives that were 700 miles from base and, so long as the pilot saw it coming, avoid the attentions of any enemy fighter, even including the Me 262. As the author explains, the evolution of cameras and film stock kept pace with these developments in aircraft performance and the ever-increasing height from which pictures were being taken was offset by the introduction of lenses of ever-increasing focal length, so that there was no loss of, indeed there was a steady improvement in, discrimination.

While it is relatively brief, compared, for instance, to the account in the book reviewed above, Dr Price's concise sixteen-page essay is more than adequate for its purpose. But this is a book about pictures, rather than words and I counted 173 of them. There are photographs of German airfields and industrial sites before and after they had been very convincingly camouflaged, of targets before and after (and sometimes while) being bombed, of the D-Day landings, of broken bridges, of airfields under construction, of shipping under attack, of major naval vessels in dock and so on. Since all of these pictures will, by definition, have been published before (some of them several times) some may seem quite familiar but the sense of *déja vu* is countered by the very informative captions. I spotted only two minor problems; I was unable to find the He 111Z to which one's attention is drawn in the photograph on page 89 (unless it is the wingtip just protruding into the bottom of the frame – I suspect that the picture has been cropped a little too tightly), and the identities of the two aeroplane types noted in the photograph on page 91 have been transposed, ie the Savoia SM 81 is an SM 82 and vice versa. Some of the photographs serve to illustrate tricks of the interpreter's trade and there is a particularly good example of the way in which a low sun can cast a shadow revealing the profile of an objective that had been very successfully camouflaged against observation from directly above. Similarly, there are interesting pictures that reveal the presence of V-1 launch sites, the tell tale signs being the skid marks and craters left by doodlebugs that failed to get airborne, and another that shows how it was possible to distinguish between a real, but camouflaged, river crossing and a more obvious dummy.

There is no pretence at profundity here, the succinct text sets out to

presents no more than a summary, but the pictures, which were well selected and well worth reproducing, might be regarded as a classic collection of wartime photography.

CGJ

The Dam Busters by Jonathan Falconer. Sutton; 2003. £25.

Few RAF operations during the Second World War have attracted such interest, or epitomised so graphically the courage of RAF aircrew, as the raid mounted by No 617 Sqn on the night of 16-17 May 1943 against the Ruhr dams. To commemorate the Sixtieth Anniversary of this epic action, the highly regarded author of other books on Bomber Command, Jonathan Falconer, has produced a superbly researched and lavishly illustrated book that offers a wider perspective on the operation. The raid has previously attracted the attention of various authors and a film maker, so some may question the need for another account. Once they have seen this book, I am sure that any such doubts will immediately disappear.

This book could perhaps best be described as the encyclopaedia of the Dams Raid. Having set the backdrop to the bomber offensive, the author relates the development of the idea and value of attacking the Ruhr dams, Barnes Wallis's concept for the UPKEEP 'bouncing bomb', and the trials that took place to prove his brilliant technological concept. The author then concentrates on the formation of No 617 Sqn under its charismatic leader, Guy Gibson, before describing the raid in great detail. With the aid of many photographs and excellent coloured maps, the reader is able to follow the progress of the raid very clearly. The author's coverage of the aftermath from the German perspective is particularly interesting, and is illustrated with many rare photographs.

The author pays due tribute to the aircrew who flew on this operation, and he has devoted sections that describe their actions, their later operations, and the decorations that they earned. He concludes the book with a fascinating insight into the making of the classic film starring Richard Todd, who has written the Foreword to the book.

The casual observer may, on first glance, think that this is an illustrated narrative of the raid, such is the extensive use of photographs, including some unique German material, and the quality of the technical drawings and maps, both of which are clear and very informative. The use of rare colour photographs of many of the aircrew adds a very

evocative aspect to the book, as does the inclusion of two excellent paintings by the well-known aviation artist, Nicolas Trudgian. However, there is much more to this book than a wide selection of excellent illustrations. Jonathan Falconer has, as usual, carried out his research in a meticulous fashion, and the great merit of his book is that it encapsulates all aspects of the epic Dams Raid in one superbly produced volume.

At a time when it seems to be the fashion for modern journalists and historians to sit in their comfortable chairs and find fault with operations that helped produce the peace that they enjoy, it is appropriate that Jonathan Falconer reminds us of the gallantry and sacrifice of so many young men of the Dam Busters. Although my private library contains all the other books describing this operation, I suspect that this volume will be the one I refer to most frequently. It is strongly recommended.

Air Cdre Graham Pitchfork

British Built Aircraft – Vol 2, South West & Central Southern England by Ron Smith. Tempus; 2003. £16.99.

As its title suggests, this book is the second in a series, the first of which was reviewed in Journal 29 (*qv*). The content and presentation are much as before – thumbnail sketches of aircraft manufacturing concerns within the region, supported by contemporary advertisements and numerous photographs, including a different picture of the BE2e that appeared in Vol 1, still masquerading as a BE2c. My main reservation is, as before, to do with the index, which simply isn't up to the job. For instance, the south west is helicopter country and, as one would expect, the narrative dealing with Westlands makes reference to GKN, but GKN does not feature in the index. Similarly, appropriate mention is made of the activities of British Burnelli, but this is another omission from the index.

Publication of the second volume reveals another problem with this series – duplication. Because the first fifty-odd pages present an historical overview of the national aviation industry, they are pretty much the same as the first fifty pages of Vol 1. There has been a little adaptation (and the previously noted errors in the table of British aircraft produced in significant quantities during WW II have been corrected) but it does mean that almost a quarter of the book is much the same as Vol 1. If this pattern is sustained, one is going to have to buy this same redundant quarter with each new volume, which is bad news for the

rainforest. Since, with only a little additional effort, the content of the generalised survey could be presented in a form that would be applicable to the whole series, it could have been published as a separate volume, which, apart from saving a few trees, would have been a more economic and user (customer) friendly approach. Like the inadequate index, this suggests a lack of forethought on the part of the publishers at the planning stage.

Despite these observations, this book is an admirable effort. Of Vol 1, I said that it 'contains many tantalising insights into long forgotten aspects of aviation and I found it very rewarding to browse through'; that comment is equally applicable to Vol 2.

CGJ

The Last of the Hunters by Martin W Bowman. Sutton; 2002. £25.

Martin Bowman's book *Last of the Hunters* contains a splendid collection of previously unpublished photographs of this wonderful aeroplane, most of them taken by the men who flew them in their prime (the men and the machines that is!) and those who maintained them. Ian Cadwallader's quotation on the back cover, 'The Hunter was not only the best looking fighter of its time but it was a magnificent aeroplane to fly', may be subjective but the fighter pilot is a subjective animal. Despite the views of Mike Haggerty on page 28 who states, 'Whatever we were to fly in future years nothing would displace the Sabre as number one in our affection', the Hunter stands head and shoulders above other types in the souls of the men who flew them with the RAF and other Services. The Hunter was graceful, elegant and exhilarating to fly and for those of us who were fortunate to fly her in her prime, she was the Queen of the Skies, views endorsed by Neville Duke, Bill Bedford and Duncan Simpson who were, in their time, the Chief Test Pilots at Hawkers.

Although the last service Hunter was retired fifty years after the first flight of the prototype P.1067, its life in the front line of the RAF was brief, as technology rapidly overtook the limited transonic performance of its generation. It served only eight years as an air defence fighter, although more than thirty squadrons and several other units operated the aircraft. This compared with twenty-four years for the Phantom and twenty-nine for the Lightning. The air defence role overlapped with another eleven years as a ground attack and reconnaissance variant compared to thirty years plus for the Jaguar. It is interesting to reflect

that in its short life as a fighter, five different production marks entered service, a procurement policy which today would be seen as grossly extravagant. The Hunter F.1 with its 100-series Avon served for only a little over a year before being retired to OCU duties at Chivenor and Pembrey, being replaced by the longer range F.4 which served for only two years or so before it too became the training variant at Chivenor. The Sapphire-powered F.2 was retired to ground instructional duties within a year or so of entry to service and its longer range successor, the F.5, lasted for barely three years before its withdrawal from service. Those squadrons which survived the 1957 Defence White Paper were re-equipped with the F.6, easily the best of the breed, powered by the 200-series Avon, before many of the latter found new leases of life within another two years or so as FGA 9s or FR 10s.

However, this profusely illustrated book is, like the curate's egg, only good in parts. The cover photograph, while technically competent, portrays a gaggle of T.7s from RAF Lossiemouth which, although a training base for RN and RAF Hunters over the years, was not a natural home of Hunter squadrons nor was the two-seater the most handsome mark of this superb aircraft. The pages contain a number of memorable anecdotes such as the great West Raynham debacle which led to the loss of six Hunter F.1s and Roger Hymans' remarkable story of his failed attempt to intercept the unreachable U-2, typical of sorties flown by many of us in the late 1950s, both in Germany and in Cyprus, which at the time were deemed to be heavily classified. Tony Alldridge's personal experience of the Black Arrows and Blue Diamonds aerobatic teams, Al Pollock's spirited account of his solo flypast of the Houses of Parliament, after flying under Tower Bridge, to mark the RAF's 50th birthday and Alastair Aked's splendidly illustrated description of flying Hunters into Iraq all make great reading.

It is good too to read some stories from the groundcrew such as Ray Deacon's tale of John Jennings' eight aircraft attack on the Beihan Fort and, from an RN artificer, Jack Rowe's observation that the Hunter was the most trouble free aircraft which he had ever come across. As an RAF armourer, Ken Hazell's vivid description of the day at Horsham St Faith when a Hunter F.4 aborted its take off and finished in a field, a Javelin caught fire while taxiing and another Hunter crash landed, is nicely matched by Boz Robinson's observations of the same event from the cockpit. It seems that Exercise VIGILANT in the spring of 1957 was

memorable from several standpoints! Unfortunately, the accompanying photographic captions describes one of the damaged Hunters, XE662, incorrectly as an F.6 and this is but one of several photographic caption errors scattered throughout the pages.

Typical is a glaring error on page 30 which shows FR 10 WW593 in the markings of No 14 Sqn, a unit which never flew the recce variant, although it did operate F.6s, latterly at Gütersloh. The aircraft was probably a decoy somewhere in RAF Germany in the early 1970s when the squadron flew Phantoms at Brüggen. On page 57 FR 10 WW593 appears again, this time incorrectly captioned as an F.6 and wearing No 92 Sqn's markings. Other mistakes include: the caption on page 74 which shows a team of armourers loading 3" rockets but describes them wrongly as 4" rockets; the Turkish fighters in the background on page 80 are not RF-84s, they are F-84Fs; and the Meteor NF 14 photographic chase aircraft on page 82 is identified as a T.7. Also, the Hunter did not serve with No 45 Sqn in 1965, as suggested in the caption on page 141. It was a Canberra unit in the Far East which was disbanded some five years later and it did not reform with Hunters until 1972. According to Francis Mason's book, *Hawker Hunter - Biography of a Thoroughbred*, XK137 was actually on the strength of No 54 Sqn in 1965.

Furthermore the Hunter justifies rather more than the brief selection of stories which are included. It seems that the author was content, having heard a few bar stories and seen a fine selection of photographs, to rush into print to meet a deadline without setting aside the time to research his topic fully. Many of the great Hunter characters who are still around would have offered some wonderful tales to enhance the Hunter Heyday chapter. The superb solo displays by Ken Goodwin of the Jever Steam Laundry when there seemed to be no minimum height for slow rolls and Headley Molland's supersonic ejection after probably leaving his flaps down in a steep dive at high Mach number deserve a mention. In 1958-59 Nicosia housed four Hunter squadrons on rotation, mainly from Fighter Command, and the competitive spirit which prevailed in the air and on the ground justify a few stories from that era. The Stradishall/Waterbeach/West Raynham Wing is hardly mentioned, although their detachments to El Adem created a fund of stories in the diaries of Nos 1 and 54 Sqns, such as 'switchery pigs' with the several cockpit positions of the rocket selector switches in the early FGA 9s causing many a drop tank to be inadvertently jettisoned. Also missing is

an account of the Hunter's first three years with No 8 Sqn at Khormaksar during which the Boss somehow managed to survive the loss of nine of his aircraft while still retaining command!

Sadly, the excellent quality and variety of the photographs is not matched by the narrative where numerous errors reveal that the writer has failed to research and edit his material adequately. Major mistakes include his assertion that Hawker's P.1052, a Nene-engined swept wing prototype, went on to become the Sea Hawk and that later production Hunters had a 'fully flying' tail. Both of these statements are untrue as the Sea Hawk emerged from the P.1040, via specification N.7/46 and the Hunter F.6 and later models had a selectable electrically-driven follow-up tailplane (using the tailplane trim motor) to vary the tailplane incidence automatically with fore and aft control column position. Although this feature did improve handling at high Mach numbers it was a poor compromise when compared to the F-86 Sabre's 'slab tail'.

Other inaccuracies include the description of DFCS as the Day Fighters' Conversion Squadron, an error probably copied from Francis Mason's book. This elite unit was in fact the Day Fighter Combat School which operated within the Central Fighter Establishment at West Raynham between 1958 and 1961. Staffed by some of the RAF's best Hunter pilots and a USAF exchange officer it ran twelve separate advanced tactical leadership courses for experienced pilots without an accident, despite the very demanding nature of the syllabus which involved all aspects of Hunter day fighter and ground attack operations, including very low altitude air combat training. Minor inaccuracies abound including the assertion on page 50 that No 118 Sqn disbanded in 1962 whereas it had actually ceased to exist some three years earlier and the House of Commons quotation at the heading to Chapter 6 which probably should read '1957', although the sentiments were equally true ten years later! Gun blast deflectors were introduced as a modification to the F.6 in 1958 but were removed within a few years, so it was not a distinguishing feature between the FGA 9 and F.6.

This book was an opportunity to produce the definitive album of the Hunter in squadron service with the RAF and RN but the reader is left with a feeling of frustration because it does not do justice to such a great aeroplane and the squadrons which operated it in its prime. Nevertheless, despite my reservations about the numerous mistakes, poor editing and the lack of completeness this splendid collection of new photographs and

anecdotes is reason alone to persuade the family to buy a copy for the bookshelf if only to show the grandchildren what an exceptionally beautiful aircraft we were privileged to fly in our youth and to remind ourselves of some stories which perhaps are best left untold!

Gp Capt Jock Heron

RAF Hunters in Germany by Günther Kipp and Roger Lindsay. 2003. Available direct from Roger Lindsay at 7 North Meadow, Hutton Rudby, N Yorks, TS15 0LD at £16.50 (inc p&p).

In contrast to the production values lavished on the 158-page casebound book described immediately above, this one is an apparently relatively modest 72-page A4 softback. But appearances can be deceptive and I have no hesitation in endorsing the remarks of another reviewer who assessed it as being 'an example of the very best in privately published aviation literature.' Written by enthusiasts, it is axiomatic that they are experts in their field and there is a notable absence of the kind of howlers noted by Jock Heron. For instance, these authors can unscramble acronyms correctly, have a clear understanding of the difference between 'all-flying' and 'follow-up' tailplanes and a firm grasp on the more subtle changes that distinguished a Hunter Mk 4 from a Mk 6. Furthermore, I detected no errors among the abundance of dates provided, which include tables providing the periods that each individual airframe spent on charge to a specific squadron (allowing for the fact that strike-off dates could sometimes occur *after* the parent unit had actually been disbanded).

Within the constraints imposed by the title, the content is very comprehensive. There is a brief summary of the RAF's post-war presence in Germany up to 1971 (when the last FR 10s were withdrawn), followed by accounts of the operational service rendered by the Mks 4, 6, 7 and 10. The contentious issue of the merits of the F-86 v the Hunter are discussed with honours being awarded, on balance, to the latter. While the authors acknowledge that the Sabre, especially the later Canadian models, did have some advantages in fighter v fighter combat, the two types were probably pretty well-matched in that respect, but they also point out that the Hunter excelled in other, critical, areas. What really counted in Germany in the 1950s was the ability to get to 40,000 feet plus, bring a devastating weight of firepower to bear on an enemy bomber, recover to base, re-arm and do it all again in as short a time as

possible. Against this yardstick, there was no contest; the Hunter won hands down.

The narrative is amplified by notes on the stations, wings and squadrons involved (including the APS at Sylt), on camouflage and markings and on aerobatic teams, and by a table summarising the circumstances surrounding the loss of each of the Hunters that had to be written off. All of this factual information is rounded off by personal reminiscences contributed by ten pilots. The best ones? Mike Hall's account of his hair-raising recovery and landing with his left hand inextricably (and very painfully) jammed in the gunsight retraction mechanism, and Al Pollock's graphic description of an operational turn round as seen from the cockpit between sorties.

And then there are the photographs, 170 of them. Few of these are familiar 'Air Ministry PR' and/or manufacturer's portraits. Most are snapshots taken on the flight line (and some air-to-air) in the 1950s, an era during which Cold War sensitivities meant that there was a very real risk of having one's collar felt by an RAF Policeman for doing just that. The result is a particularly interesting collection of pictures featuring Hunters in unit markings that have rarely been illustrated. The interest is heightened by the fact that forty-five of these photographs are in colour, their publication serving to highlight the enormous advances that have been made in photographic technology since the 1950s, many of the earlier shots having very marked tonal, contrast and colour imbalances.

Highly recommended. If you were a Hunter man I think that you will really enjoy this one.

CGJ

Those Fabulous Flying Years by Colin Cruddas. Air Britain; 2003. £29.95.

Those Fabulous Flying Years tells the story of the civilian pilots who brought aviation to the attention of the pre-war British public. The narrative covers the whole range of endeavour from the five-bob-a-flip-from-a-local-field joyrides being offered by barnstormers in clapped out war surplus DH 6s in 1920 to the highly professional organisations that operated fleets of a dozen or more aeroplanes in the 1930s. Detailed annexes include: biographical sketches of leading personalities; potted histories of the many commercial enterprises involved (many of them short-lived, because profit margins often turned out to be somewhere

between slim and non-existent), including the names of key players and fleet lists of the aeroplanes that they operated; and the itineraries followed by the major travelling shows, including, in the case of Cobham's National Aviation Day Tours, the South African exercise of 1932-33.

Unusually for Air Britain, this hardback has a separate dust cover. Although the book runs to only 128 pages and actually feels quite 'slim' the content turns out to be remarkably comprehensive. Coated paper is used throughout and this, allied to the page size, has allowed for the best possible reproduction of the numerous (I made it about 150) illustrations, many of them being given a whole (A4) page. Best of all, the book is a pleasure to read. Cruddas gives us all of the information that we need presented in a flowing prose, entirely devoid of typo-blight, that carries the reader easily along.

The story is punctuated by entertaining anecdotes and new, to me at least, insights. For instance, who knew that in 1929 an anonymous donor (Lord Wakefield) paid for 10,000 children to be given a free ride by Alan Cobham and his team? Many members will be aware of Tom Campbell-Black, but who knew that the senior pilot *and* the senior engineer of his twelve-aircraft British Empire Air Displays team of 1936 were both women? What about Claude Grahame-White who visited 121 towns along the south coast, giving 500 demonstration flights and carrying 1200 passengers; a remarkable achievement at any time, but this was in 1914! Then again, I knew that Geoffrey Tyson's pre-war party trick was to snatch a handkerchief from the ground with a hook attached to the wingtip of his Tiger Moth – but I had not really appreciated that he used to do this twice a day, seven days a week – and then there was Charles Turner-Hughes who logged 170 hours of inverted flight in 1932 alone. And just in case you thought that 'groupies' were a modern phenomenon, in the course of his 1932 tour, Cobham discovered that the same girls who mysteriously turned up at successive venues were not aviation enthusiasts after all; they were being transported from site to site in one of his Handley Page airliners, serving as a 'concubine carrier', to provide a 'morale booster' for the boys. I could go on, but you ought to read this one yourself.

It could be argued that an historical account of joy-riding is of little relevance to a military aviation society such as ours but there is a definite link in that the barnstormers probably provided much of the inspiration

that led people to join the RAFVR. It is claimed that, when asked if they had ever flown before, 75% of candidates applying for aircrew training in 1939-40 said, 'Yes, with Cobham's flying circus'. This very entertaining book does have something to tell us and it is highly recommended.

CGJ

Beyond Courage by Norman Franks. Grub Street; 2003. £18.99

In *Another Kind of Courage* Norman Franks recounted the exploits of the Walrus crews engaged in air-sea rescue operations in the waters around the UK during WW II. *Beyond Courage* completes the picture by dealing with Walrus rescues in the Mediterranean. I have a few niggles over the presentation. For instance, why use full stops instead of hyphens when referring to US aircraft? eg P.38 and B.25 for P-38 and B-25. There are some imprecisely designated *Luftwaffe* units, eg JG/52 for JG52, 2/SGK 10 for 2./SKG10 and 2/(F)123 for 2.(F)/123; it only takes a little care to get them right. Similarly, I suspect that a tragic incident that occurred at Cutella on 29 April 1944 involved Thunderbolts of the US 325th Fighter Group (not Squadron). Some of the locations of aerodromes are also seriously adrift, Abu Sueir, for example, was not 'some 20 miles south of Alexandria'; it was more than 100 miles to the east, near Ismailia. Then again, Burgh-el-Arab (LG39) was nowhere near Benghazi and Capodichino is close to Naples, not on the heel of Italy. There are one or two stray typos, including Halwen (for Helwan) and HMS *Argos* (for *Argus*), and a passage from a contribution by FS J A Reid is reproduced twice, once on page 91 and again on page 132.

While it is a pity that this sort of thing was not picked up at the proof-reading stage, I should not overstate the case. The reader may find such occasional careless oversights a little annoying but few of them have much impact on the tale that is being told. One rescue was pretty much like another, of course, so it is inevitable that the narrative may sometimes seem to be a little repetitive. This problem is minimised, however, by numerous, and sometimes quite lengthy, contributions by many of the veterans, both rescuers and rescuees, whom the author has tracked down and interviewed. The book is rounded off by the usual Grub Street-style insert of snapshots of people and aeroplanes. There are several appendices; the most useful of these tabulates the main Mediterranean rescues in which a Walrus participated, providing, date,

crew, aircraft number (where known) and brief remarks, usually including the identity of the aircrew saved. Finally, there is an index to all personalities mentioned in the text, permitting one to find more detail on a specific incident.

It is easy to overlook, but an ASR capability was, and it still is, an important component of a balanced air force. This was a story that was long overdue for telling and this book tells it well.

CGJ

Dog-Fight by Norman Franks. Greenhill Books; 2003. £18.99

Paradoxically, rather than fading into obscurity with the passage of time, our understanding of the first war in the air is probably clearer today than at any time in the past. In terms of fighter pilots' 'scores', for instance, early aviation writers appear to have been content to accept at face value the wartime victory tallies that had been credited to the 'aces'; although this may be selling them short, because they could do little else. Until the Fifty Year Rule was reduced to a mere thirty in 1968, the dead hand of British bureaucracy maintained a tight grip on information as potentially damaging to national security as the combat reports submitted by the pilots of Sopwith Camels in 1918. Since then, however, with the opening of archives here and elsewhere, a great deal of work has been done to establish what really happened in the skies over France during WW I. Norman Franks has been at the forefront of this effort for many years and, so far as the exploits of the fighter pilots of the day are concerned, he is one of the most prolific of British writers in the field.

There is only so much original material to work with, of course, and much of the factual information inevitably tends to be recycled from book to book. In search of a sharper focus, the author's latest effort is subtitled *Aerial Tactics of the Aces of World War I*. The attempt to provide a theme has not, I think, been entirely successful because of the way in which the book has been organised. Rather than tracing the evolution of aerial tactics and fighting techniques, and illustrating progress by citing examples, the emphasis is reversed and what we are actually presented with is more of a series of accounts of what representative pilots did at various times and of how they did it.

That is not to say that there are no references to the progressive development of tactics; they are certainly there, but the evolving picture is not as clearly drawn as it might have been and some aspects are not

addressed at all. There is, for instance, little analysis of the trend towards bigger units. It had been agreed as early as January 1918 that the size of the RFC's single-seat fighter units should be progressively increased to twenty-four aeroplanes apiece (plus one for the CO) and by the time that the shooting stopped in November ten squadrons had twenty-five aeroplanes and twenty-seven pilots on strength (compared to the previously standard eighteen and twenty-one, respectively) which must surely have had significant tactical implications. Then again, we are told nothing of the work of the Aerial Tactics Committee, which must have contributed *something* positive, or of the use of wireless telephony by selected Bristol Fighter squadrons from mid-1918, which must also have, at least begun to have, had some influence on the way in which formations were being handled. It could be argued, of course, that I am criticising the book that I had been hoping to read, rather than the one that the author actually wrote. That is probably true, but I do think that an opportunity has been missed.

So what of the book that we do have? Typos? Yes, there are a few, 'possbily', for example, and faired (for fared), 'defencive', 'carryied', 'th', and 'Boyou' (for Boyau). There is also a tendency towards duplication; an analysis of Ball's score is presented twice, as is much of the summary of Boelke's career and we are informed of the date of Voss' demise four times. The oft-repeated allegation, that the RFC/RAF declined to provide its pilots with parachutes, for fear that they might abandon their aeroplanes rather than fight, is given another airing, although, as is invariably the case, no contemporary evidence is presented to justify this very serious accusation (which is, I suspect, actually based on post-dated anecdote). Nevertheless, these cavils aside, and within the constraints imposed by the nature of the subject matter, the narrative flows well enough. There are about sixty excellent photographs inset within the text and these have turned out surprisingly well, considering the relatively low grade of paper on which the book has been printed and the coarse screening that has been used. There are several diagrams illustrating tactical formations, although I found some of these and/or their captions a little difficult to interpret, and several names have been omitted from the index to personalities.

Among the fresh insights that illuminate *Dog-Fight* are references to, and a number of verbatim extracts from, interviews that the author conducted from the 1960s onwards with veterans of WW I, several of

whom, Hollinghust, Gould-Lee and Leask, for example, had reached air rank before retiring. There are even first hand recollections from a number of observers, the generally overlooked tribe who actually did much of the damage inflicted by 'Fees' and Bristol Fighters. These interludes add to the texture and there will be few readers who will not find something new buried within the text. There is, for instance, a tantalisingly brief reference to the RFC's monitoring of enemy radio transmissions to trigger the launching of fighters and I had not previously appreciated that, within the German air service, only a regular officer could command a *Jagdgeschwader*. In practice, because of seniority, if nothing else, the same tended to be true of British wings, but this was clearly not a matter of policy as Lt-Col Louis Strange (who features in the book as a significant early, and late, aerial tactician) was a notably aggressive Wing Commander. Strange was no career officer, however; an RFC Special Reservist in 1913, he was back in civvies before the end of 1919.

Dog-Fight is also particularly good at amplifying the differing attitudes adopted by the various air forces towards, and policies implemented to govern, the validation of combat claims. This is hardly breaking new ground, of course, but one point is made particularly graphically by the previously noted re-assessment of Ball's forty-four victories, which, the author reasons, would have been more like twenty-seven using WW II rules, whereas Johnnie Johnson's thirty-eight on Spitfires might have been as high as fifty-nine if he had been flying SE5as. Another point that is well illustrated, with specific examples, is the remarkable extent to which recognised claims that had been submitted in good faith, even those which had been supported by witnesses, were not reflected in the losses actually sustained by the opposition.

Final verdict? A worthwhile investment, even if your shelves are already well-furnished with books on the fighter pilots of WW I. For those who do not have a reasonably firm grasp of the subject, however, *Dog-Fight* will provide a very sound foundation.

CGJ

Under the Guns of the Kaiser's Aces by Norman Franks and Hal Giblin. Grub Street; 2003. £20.

The successful *Under the Guns…* series, reviews in depth the victory

scores of selected 'ace' German fighter pilots of WW I. This one, a 192-page hardback, deals with Böhme, Müller, von Tutschek and Wolff. In each case we are provided with biographical details and an account of the subject's military career, amplified by a detailed examination of each of the subject's combat claims. The participants in each incident are identified and, to the extent that records permit, we are presented with a reconstruction of what occurred, this exercise serving to ratify the majority of claims while revealing which 'victims' actually survived to fight another day. Details of the background and military career of each of the victims, real and imagined, are also provided. Remarkably, the authors have been able to unearth pictures of a large proportion of the people involved and the book contains numerous photographs of individuals and, in some cases, their (often wrecked) aeroplanes.

The fact that this is the third book in the series testifies to the popularity of the formula. It is, I think, deservedly successful because the investigations are in sufficient depth to persuade the reader that the authors' conclusions are valid while, at the same time, adding a worthwhile degree of texture to the cold statistics of victory tallies. There is, for instance, a charming anecdote describing No 2 Sqn's Maj Hubert Harvey-Kelly's sportsmanlike ('Your bird, I think') relinquishing of credit for what was probably the first ever aerial victory (on 25 August 1914) to Lt Cuthbert Rabagliati of No 5 Sqn. By reading between the lines, one can also discern the effects of some of the social distinctions of the day. Most British aviators of WW I were officers and it is relatively easy (and 'relatively' is the operative word here, not 'easy') to find details of their careers; it is much harder to do this in the case of non-commissioned personnel. This becomes apparent in this book where there are a couple of instances of a commissioned pilot being afforded half a column or so while the details applicable to his air mechanic gunner may be confined to little more than name, rank and serial number. Other Ranks were not quite anonymous, but they were often not much more than nominal.

Recommended.

CGJ

Typhoon Attack by Norman Franks**.** Grub Street, 2003. £19.99.

Originally published in 1984 by Kimber; this new edition includes three fresh contributions as an appendix. It is the story of an ultimately

very successful WW II aircraft which, after a fair share of teething problems, became a devastating ground-attack aircraft in Normandy and NW Europe. Much of the book is related by veterans, pilots and groundcrew, with the experienced author providing the background and interlinking.

It is a well-tried formula, provided that one remembers that memories are not infallible and that it is a good idea to check on items that might raise the eyebrows of the average reader. For example, on page 63, where a pilot recalls a 'very rough' low-level anti-shipping attack on Cherbourg Harbour on 24 October 1943, involving Nos 257 and 183 Sqns (Typhoons) and No 263 Sqn (Whirlwinds): 'Anyway, out of 24 aircraft we lost ten and eight pilots, two pilots being rescued from the Channel.' So what does *RAF Fighter Command Losses*, by the same author, say? 'Seven aircraft lost including two landing in UK with category B damage and SoC, pilots safe; of the remaining five aircraft two pilots survived as PoWs and three were killed.'

Despite some blemishes, the many contributions from the veterans are good value, even if inevitably variable, and the book is generously illustrated. If you have associations with the 'Tiffy' this one should please you.

Roy Walker

The Greatest Squadron Of Them All by David Ross, Bruce Blanche and William Simpson. Grub Street; 2003. Two volumes at £30 each.

There are many units which might have aspired to being called the 'greatest of them all' but they were all too slow off the mark and No 603 (City of Edinburgh) Sqn, RAuxAF has clearly established its copyright to the title. Declaring itself to be the 'definitive' history of the unit, one could hardly dispute that claim as this two-volume effort runs to almost 800 pages and contains not far short of 600 photographs. In a work of this size, it is almost inevitable that there will be some inaccuracies and this one is no exception. Just to show that that I did actually read both books (and *not* simply to pick fault) I would cite the following examples from Vol 1: in 1925 James Newall would have been a Wireless Operator, not an Air Signaller; the 'E' in WEM stood for electrical, not electronic; early parachutes were designed by Calthrop (not Colthrop); the annual camp group photograph on page 30 (with a Wapiti in the background and airmen wearing buttoned-up-to-the-chin tunics) surely dates from earlier than 1938; Sir Christopher Brand was a South African (not a New

Zealander) and the cowled and spatted Wapiti illustrated on page 16 is plainly a Wallace.

I suspect that the latter is K3672 of No 501 Sqn but the serial is too indistinct to read with confidence, which brings me to the only substantial reservation that I have about this book – the photographs. It was only to be expected that faded, sepia-tinted prints of snapshots inexpertly taken with a Brownie box camera more than half-a-century ago would leave something to be desired. Despite this, I am sure that, with just a little more TLC, some of them could have been reproduced to a higher standard than they have been. As it is, many of the pictures are very lacking in contrast, making them disappointingly flat and 'muddy'.

But I should not overstate the down side. A participant in the Battle of Britain with Spitfires, No 603 Sqn went on to defend Malta before switching to the maritime strike role, operating Beaufighters over the Mediterranean, finally returning to the UK to end the war, back on Spitfires, and flying attack missions. The authors tell this story in considerable detail and provide, along the way, thumbnail sketches of many of the squadron's more prominent personalities, particularly its Battle of Britain pilots. All of the expected annexes are there, covering aeroplanes used, nominal rolls, victory claims, medal citations and so on. The authors are also to be commended for the objectivity with which they have told their tale. All squadrons have skeletons in their cupboards, and they have not been afraid to take 603's out and rattle them. Thus, while we read, for instance, of the unit's involvement in the reinforcement of Malta, by the remarkable expedient of flying Spitfires from the deck of the USS *Wasp*, we are also reminded that one of its pilots promptly turned right and took himself off to French North Africa. The book is not exclusively dedicated to WW II, however, and considerable space is devoted to the pre-war and post-war eras which sheds a good deal of light on the nature of life on an auxiliary squadron in peacetime.

Highly recommended as an admirable contribution to the recording of RAF history and a credit to the authors and the Squadron Association. This book provides a standard which the writers of any forthcoming squadron histories would do well to emulate.

CGJ

North American F-100 Super Sabre by Peter E Davies with David W

Menard. Crowood; 2003. £29.95

Beautifully illustrated, with several previously unpublished photographs from private collections, this excellent reference book contains a wealth of detail about the F-100 Super Sabre, the first fighter capable of achieving supersonic speed in level flight and the first of the USAF's 'Century Series'. Its pedigree was impeccable, a product of the Inglewood design team which created the legendary F-86 Sabre, probably the finest jet fighter of its time, and the earlier but equally distinguished P-51 Mustang, but it was the last fighter to be produced by North American Aviation.

Peter Davies' painstaking research, with the support of David Menard (whose USAF service career, and later his enduring hobby, revolved around the F-100 story) has produced an admirable account, which contains previously unpublished information on the few RF-100A reconnaissance aircraft deployed to Germany in the mid-1950s specifically for high altitude but limited penetration of the Warsaw Pact's borders before the introduction of the U-2. The book contains very few editing errors and is divided into six lengthy chapters detailing the design and development of 'the Hun', its operational deployments, with comprehensive information on unit moves and commitments, its use by the Air National Guard with similar details of units and an account of its use by foreign air forces including the *Armee de l'Air*, a service whose equipment is normally of French design and manufacture. There is a seventh, but superfluous, chapter which describes the F-107, a successor to the F-100 of which only two prototypes were built to compete unsuccessfully with the Republic F-105.

The first chapter describes the development programme and covers the severe handling problems of the early A-model which killed North American's chief test pilot George Welch in 1954 and, a few weeks later, Air Cdre Stephenson, Commandant of the RAF's Central Fighter Establishment. These shortcomings are described fully as are the measures taken to deal with them but almost a year earlier, the prototype had gained the world's speed record flown by a service test pilot, Lt-Col 'Speedy Pete' Everest of the USAF, to publicise its newest fighter. Notwithstanding this bonus, the aircraft was grounded for urgent structural modifications following the loss of six early production models and a critical review by operational test and evaluation pilots at Eglin in 1955 meant that its future as a fighter was to be limited.

However, despite this costly and inauspicious start to its career, the North American engineers and their USAF customer retained faith in the basic design of the aircraft. Subsequent chapters go on to provide an insight into its later development as the longer range F-100C and more capable F-100D tactical fighter-bombers and to describe their world-wide deployment in the strike/attack role in which the Hun performed at its best.

The author emphasises that, until the arrival in theatre of the more capable F-105, the versatile F-100 was the workhorse of early air operations in South East Asia where the first offensive sorties were flown in 1964 against the Pathet Lao. Later it was used mainly over South Vietnam, Cambodia and Laos where the author states that the Hun flew more sorties in the following six years than did the Mustang during the Second World War, a claim which is hard to believe. Nevertheless, it found its niche in the skies over South Vietnam where it built a sound reputation as an enduring and effective attack aircraft and where the two-seat F-model, suitably equipped with modified avionics, paved the way for the later F-105G Wild Weasel. Throughout this book the numerous personal, and often colourful, anecdotes of the pilots and groundcrews involved in these operations are vivid and readable, adding interest and authority to the story of this great fighter-bomber's remarkable career which spanned some 34 years in front line service with the USAF and four other air forces.

With its long nose, flat oval air intake and low set tailplane the Hun was a familiar sight over Britain during the 1960s, flying from the USAF bases at Lakenheath, Wethersfield, Woodbridge and, briefly, at Upper Heyford where its presence on 'Victor' alert duties was a vital contribution to the Cold War. Many of us gained our first experience of American fighter cockpits in the back seat of an 'F in the 1960s and the Hun was flown on exchange duties by a score or more RAF pilots, at least one of whom was deployed with his squadron to Florida on standby for operations in support of the Cuban missile crisis. Despite the Hun's peculiar handling characteristics at high angles of attack and the tendency for its J57 engine to surge under these circumstances, they developed great affection for the last of the North American fighters. For those with a special association with the first of the 'Century Series' this is an essential book for the personal library and for those whose interest may be more superficial it still makes excellent reading.

Gp Capt Jock Heron

A Separate Little War by Andrew D Bird. Grub Street; 2003. £18.99

The war in question was the one fought by the Banff Strike Wing in 1944-45. It was certainly 'separate', in that it tended to be conducted in relative isolation and with little attendant publicity, but 'little' belies the surprising scale of the anti-shipping campaign fought in Scandinavian waters, as it routinely involved formations of sixty aeroplanes and often many more. Because such operations were often mounted jointly, the narrative also covers much of the activity conducted by the Dallachy Wing, the dedicated Mustang escort squadrons based at Peterhead and the ASR Warwicks detached to fly in support.

The story draws heavily upon the facts and figures provided by the relevant Operations Record Books, amplified by the customary recollections of eye-witnesses and participants. So long as the author stays within the bounds set by these sources, the book provides what appears to be a convincingly accurate account of what went on, although I do have some reservations about an anecdote in which the contributor recalls having spent 30 minutes at the controls of a Mosquito VI while flying as a passenger during a delivery flight in 1945 – although one is tempted to fantasise about the opportunities presented to him as a teen-aged ATC cadet in the course of swapping seats with a female ATA pilot. While that particular tale may be a little hard to swallow in its entirety, it was clearly not actually concocted by the book's author; nevertheless one's confidence in his writing is somewhat undermined by the many minor errors which hint at significant gaps in his basic knowledge of the RAF and/or of geography. For instance, Aarhus is not, as the author states (p160), on the west coast of Denmark and the account of an action fought in the vicinity of Ålesund on 7 December 1944 (p64) simply cannot be related to a map of the area. Then again we have Ossington aerodrome presented as Ossingham, Crimond as Crimmond, Lerwick as Lervick, Edzell as Edzall and Donibristle as Donnybristle. It is possible, of course, that some of these are merely typos, because there are plenty more of those, eg bead (for head), ADBG (for ADGB), scrapped (for scraped), Consul (for Consol), accessing (for assessing), Butles (for Butler), expedited (for expended) and so on. Then again we have stray references to Mosquito IVs (which should have been

to Mk VIs), to the Hs 297 (probably vice the Hs 293), and to No 524 Sqn being equipped with Wellington XVIIIs (instead of XIIIs).

In one case, where the author refers to the short northern light of a Norwegian summer, a (presumed) typo has completely changed his meaning – short 'night' surely. This sort of thing really ought to have been picked up at the proof-reading stage and an independent reader might well have ironed out several instances of careless sentence construction. For instance, the first serious *Luftwaffe* reaction did not occur when the RAF aircraft 'took off' on 7 December; it happened several hours later. Similarly, those were not 'cannon' that 'flashed past' in combat; they were shells. The worst example is a passage that reads 'unfortunately only three passengers were killed'; would it have been better if the RAF had killed *more* Norwegian civilians? Then again, while *Flt Lt* Shanks was certainly an American, he can hardly have been 'USAAF' and by page 161 AVM Aubrey Ellwood has been promoted to air chief marshal in a garbled reference that should really have been to Sholto Douglas. There are other annoying anomalies and inconsistencies. What, for instance, was the significance of the 'B' suffix in the designation of the Mustang IIIB? And why identify some *Luftwaffe* aircraft in English, as in 'Black 11', and others in German as in '*Weisse* 4'? But if you are going to do it, the corresponding (nominative, feminine) form of yellow would be *Gelbe*, not 'Glebe'!

The photographic content amounts to some ninety very interesting, and mostly fresh, pictures of aeroplanes, of personalities (both friend and foe) and of combat situations. I would have to take issue with a couple of captions. For instance, a line-up of Ju 188s is identified as belonging to '26 KG/III' which should, I am sure, read III./KG26. Another picture is claimed to show, presumably Polish, pilots of No 315 Sqn clustered around a late model Mustang. No 315 Sqn never progressed beyond the Mk III; there do not appear to be any Polish uniforms present and the aeroplane's (black and yellow?) banded spinner would strongly suggest that we are actually looking at a bunch of No 19 Sqn's chaps with one of their Mk IVAs.

I am afraid that the foregoing will have presented a rather gloomy picture. That is unfortunate because the book is not really as bad as I have probably painted it. It certainly provides an excellent impression of the conduct of the campaign that it sets out to chronicle and, the defects in the presentation aside (and I have cited only examples here), it is not

that bad a read. Despite my adverse comments, I suspect that the core of the book is pretty sound and, somewhat paradoxically, therefore I still have no hesitation in recommending that you should read it. I am sure that 95% of the content is good stuff – the problem is knowing whether you have spotted the odd 5%. In short, while I would go to this book as a readily accessible source, I would feel the need to double-check before I used it as a reference – which is a problem for a book of this nature.
CGJ

ROYAL AIR FORCE HISTORICAL SOCIETY

The Royal Air Force has been in existence for over 80 years; the study of its history is deepening, and continues to be the subject of published works of consequence. Fresh attention is being given to the strategic assumptions under which military air power was first created and which largely determined policy and operations in both World Wars, the inter-war period, and in the era of Cold War tension. Material dealing with post-war history is now becoming available under the 30-year rule. These studies are important to academic historians and to the present and future members of the RAF.

The RAF Historical Society was formed in 1986 to provide a focus for interest in the history of the RAF. It does so by providing a setting for lectures and seminars in which those interested in the history of the Service have the opportunity to meet those who participated in the evolution and implementation of policy. The Society believes that these events make an important contribution to the permanent record.

The Society normally holds three lectures or seminars a year in London, with occasional events in other parts of the country. Transcripts of lectures and seminars are published in the Journal of the RAF Historical Society, which is distributed free of charge to members. Individual membership is open to all with an interest in RAF history, whether or not they were in the Service. Although the Society has the approval of the Air Force Board, it is entirely self-financing.

Membership of the Society costs £15 per annum and further details may be obtained from the Membership Secretary, Dr Jack Dunham, Silverhill House, Coombe, Wotton-under-Edge, Gloucestershire. GLI2 7ND. (Tel 01453-843362)

THE TWO AIR FORCES AWARD

In 1996 the Royal Air Force Historical Society established, in collaboration with its American sister organisation, the Air Force Historical Foundation, the *Two Air Forces Award*, which was to be presented annually on each side of the Atlantic in recognition of outstanding academic work by a serving officer or airman. The RAF winners have been:

1997 Wing Commander M P Brzezicki MPhil MIL
1998 Wing Commander P J Daybell MBE MA BA
1999 Squadron Leader S P Harpum MSc BSc MILT
2000 Squadron Leader A W Riches MA
2001 Squadron Leader C H Goss MA
2002 Squadron Leader S I Richards BSc

THE AIR LEAGUE GOLD MEDAL

On 11 February 1998 the Air League presented the Royal Air Force Historical Society with a Gold Medal in recognition of the Society's achievements in recording aspects of the evolution of British air power and thus realising one of the aims of the League. The Executive Committee decided that the medal should be awarded periodically to a nominal holder (it actually resides at the Royal Air Force Club, where it is on display) who was to be an individual who had made a particularly significant contribution to the conduct of the Society's affairs. Holders to date have been:

Air Marshal Sir Frederick Sowrey KCB CBE AFC
Air Commodore H A Probert MBE MA

SECRETARY
Gp Capt K J Dearman
1 Park Close
Middleton Stoney
Oxon
OX25 4AS
Tel: 01869 343327

MEMBERSHIP SECRETARY
(who also deals with sales of publications)
Dr J Dunham
Silverhill House
Coombe
Wotton-under-Edge
Glos
GL12 7ND
Tel: 01453 843362

TREASURER
John Boyes TD CA
5 Queen's Close
Stansted
Essex
CM24 8EJ
Tel: 01279 814225

EDITOR and PUBLICATIONS MANAGER
Wg Cdr C G Jefford MBE BA
Walnuts
Lower Road
Postcombe
Thame
OX9 7DU
Tel: 01844 281449