ROYAL AIR FORCE

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ROYAL AIR FORCE HISTORICAL SOCIETY

CONTENTS

SELECTED GLOSSARY

2IC	Second in command
AMB	Agile multi-beam
AMES	Air Ministry Experimental Station (a ground, often mobile, radar unit)
BEF	British Expeditionary Force
BMARC	The British Manufacture and Research Company
C2	Command and Control
CAS	Close Air Support
CBRN	Chemical, Biological, Radiological and Nuclear
CFACC	Combined Force Air Component Commander
COIN	Counter Insurgency
EOD	Explosive Ordnance Disposal
FAC	Forward Air Controller
FSCL	Fire Support Coordination Line
GCAS	Ground Alert Close-Air Support
IOT	Initial Officer Training
ISTAR	Intelligence, Surveillance, Target Acquisition and Reconnaissance
JDOC	Joint Defence Operation Centre
JFACC	Joint Force Air Component Commander
JROC	Junior Regiment Officers Course
JTAC	Joint Terminal Attack Controller
KAF	Kandahar Airfield
KIA	Killed In Action
LAV	Light Armoured Vehicle
PJHQ	Permanent Joint Headquarters
RAOC	Royal Army Ordnance Corps
RCR	Royal Canadian Regiment
SHAPE	Supreme Headquarters Allied Powers in Europe
SHORAD	Short Range Air Defence
SLR	Self -Loading Rifle
SW	Support Weapons
TWU	Tactical Weapons Unit

THE RAF REGIMENT

RAF MUSEUM, HENDON, 12 April 2017

WELCOME ADDRESS BY THE SOCIETY'S CHAIRMAN

Air Vice-Marshal Nigel Baldwin CB CBE

Ladies & Gentlemen – good morning. Today, as you know, we are going to mark the 75th anniversary of the formation of the RAF Regiment. The programme you have in front of you has been largely devised by serving Regiment officers with encouragement from our Editor, Jeff Jefford. He is grateful, in particular, to Sqn Ldr Jules Gavars for his help and co-operation while serving as the main point of contact between the Society and the Regiment during the run-up to today's event.

Besides our Society's members here today, we welcome several serving members of the Regiment, mostly from RAF Marham. In particular, we are delighted that the present-day Commandant General of the RAF Regiment, Air Cdre Frank Clifford, can be with us. Frank will be talking to us towards the end of the afternoon.

Our Chairman for the day, our Society's President, Air Chief Marshal Sir Richard Johns, will be, albeit metaphorically, wearing his Honorary Air Commodore of the RAF Regiment uniform to keep events under control but, before I hand over to him, I would like to give my usual thanks to Maggie Appleton, the CEO of the RAF Museum, and to her colleagues for their usual help. Without them, we would find life very difficult as a Society.

Sir Richard – you have control.

CHAIRMAN'S OPENING REMARKS

Air Chief Marshal Sir Richard Edward Johns GCB KCVO CBE

This year the RAF Regiment celebrates the 75th anniversary of its establishment as an integral part of the RAF. A 75th birthday is – as I well remember – a good time to draw breath and take stock, to learn from the past and to plan for the future. That is what today is all about and why the Society considered it timely to review the Regiment's contribution to the history of our Service. And, in so doing, to examine the reasons for the existence of a ground fighting element within the structure of a Service whose *raison d'etre* is the generation and exercise of air power.

Before I introduce the first speaker, perhaps you will forgive my indulging in some personal whimsy about my relationship with the RAF Regiment during my 44 years of service.

A month before I handed over as CAS I received a letter from Mr Geof Hoon, the then Secretary of State for Defence. It read:

> 'I write on behalf of the Air Force Board of the Defence Council to inform you that HM The Queen has been graciously pleased to approve your appointment as Honorary Air Commodore of the RAF Regiment. Your appointment takes effect from the 22nd April 2000 and will be announced in the RAF Supplement to the London Gazette on 25th April 2000. Many congratulations.'

This came as a total surprise, and all the more so because I was a member of the Air Force Board (AFB) who were kindly offering me their congratulations! My PSO, Wg Cdr Andy Pulford, could offer no explanation and none was forthcoming until the next day, when I received a letter from the Commandant General (CG) at that time, Air Cdre Richard Moore. He kindly congratulated me on my appointment as the first Honorary Air Commodore (HAC) of the RAF Regt and invited me to visit RAF Honington, by now the Regiment Depot, for presentation of Regiment flashes – sometimes referred to as 'mudguards'. It then transpired that, in seeking

The 'mudguards'.

approval of my appointment, he had gone directly to The Queen as Air Commodore-in-Chief of the RAF Regiment, neatly hurdling over the AFB. Putting aside any concerns about protocol, one immediate lesson can be learnt. If you are keen to wear Regiment flashes, get yourself appointed HAC as you will then miss all the horrors and indignities of the Junior Regiment Officers Course.

In his letter, the CG went on to refer generously to 'my unstinting and unique support of the Corps throughout my years of service.' This was something of an exaggeration as, during my three years as a Cranwell Flight Cadet, my feelings for the RAF Regiment were not illuminated by sweetness or light. Sixty years later I have not forgotten two names in particular that still rumble around my memory. First was Mr Gallagher, the College Warrant Officer. On a Church Parade, in my second year, I smiled at one of his less than merry quips only to be told in a thunderous Irish brogue, 'Drill is no laughing matter, Sir!' and then he charged me with being idle on parade. No matter three days restrictions – no laughing matter – it was the humiliation of the snigger, unchallenged by the WO, that reverberated through the ranks of B Sqn.

The following year, three days before the end of our penultimate term and the achievement of senior entry status, the Senior Ground Defence Instructor, Sqn Ldr Hudson, RAF Regt, snuck up on his bike behind me and a shortly-to-be-commissioned under officer. I was telling him all about my final trip of the term in a Meteor F8 when Sqn Ldr Hudson charged me with talking while marching between the flight line and the College. This time my Squadron Commander, a long standing and strong supporter of this Society, reminded me of my responsibility to set an example before dismissing the charge. Suffice now to say that these incidents, and others besides, when I crossed swords with Regiment officers and SNCOs always left me on the losing side. Hence a general and rather juvenile disenchantment with the RAF Regiment when I was commissioned in December 1959.

So what was responsible for my Pauline conversion to supporting and furthering the best interests of the Corps? First, I started to grow up and then I spent two years at RAF Khormaksar from 1965 to 1967 during the height of a terrorist campaign intended to accelerate our departure from South Arabia. The threat to the airfield, its installations and many aircraft – there were three flying wings on the Station – was

real, immediate and enduring. The fact that we left Aden without the loss of a single aircraft on the ground or damage to infrastructure through terrorist activity was to the eternal credit of the two RAF Regiment field squadrons based at Khormaksar.

Moving on, in June 1976 the RAF Germany Harrier Force deployed into the field for the summer exercise to prepare for the autumn off-base TACEVAL. To help the Force warm up for the challenge ahead, HQ RAFG had kindly arranged for a Sabre Squadron of the SAS to provide the exercise enemy. Before we deployed, as a Harrier Squadron Commander at the time, I was tasked as liaison officer with the SAS and to brief the Squadron Commander on the Harrier concept of operations. When we met, the major – later to become Director Special Forces – was accompanied by his sergeant major. After my briefing, I invited questions. 'I've got one,' said the sergeant major, 'You've talked about aircraft, weapons, fuel, ground equipment and so on, but where do the pilots hang out?'

With an eye for the quick kill, the sergeant major had immediately identified the most critical component within the complex structure of the deployed Harrier Force at that time. He had recognised that air power is the product of many parts, some more important than others, and all vulnerable to ground attack. This critical vulnerability was, and remains, conditioned by the comparative speed of replenishment of losses whether human or material. And it takes a long time to train aircrew to combat readiness! So, the constituent elements of air power are, without exception, at their most vulnerable on the ground. It is this simple truism that has underwritten my longstanding and enduring support of the RAF Regiment as an integral part of the Royal Air Force. I was thus proud and honoured to receive the appointment of HAC to the RAF Regiment. Hence my presence here today wearing two hats, the second being President of this Society. And it is in this capacity that I am delighted to introduce our first speaker, the Corps Historian, Dr Nigel Warwick.

THE RAF ARMOURED CAR COMPANIES IN THE MIDDLE EAST 1921-1939 AND THE RAF SCHEME OF AIR CONTROL

Dr Nigel Warwick

A New Zealander, Nigel Warwick is a graduate of Massey University and The University of Melbourne. He is currently a Senior Lecturer in Plant Science at the University of New England, New South Wales, Australia, where he is also supervising doctoral research on Airfield Defence. He has written two books dealing with the RAF Regiment and its predecessors, Constant Vigilance: The RAF Regiment in the Burma Campaign *(2007) and* In Every Place – The RAF Armoured Cars in the Middle East 1921-1953 *(2014), and was appointed as the Corps Historian to the RAF Regiment in 2008.*

Introduction

In August 1914, Commander Charles Rumney Samson of the Royal Naval Air Service (RNAS) was ordered to take his Eastchurch (Mobile) Air Squadron to the continent to establish an advanced air base at Ostend, and later Lille, to interdict Zeppelin raids that were threatening the United Kingdom. With a serious threat to his airfields from the advancing German cavalry, Samson realised that he needed a forward and aggressive ground defence to support his air operations. He began experimenting with private 'armed motor cars' mounted with Maxim guns and covered in steel plate. These he used to recover downed pilots and their aircraft and to conduct coordinated air-ground offensive operations. The concept of air-ground integration was clearly demonstrated and became the crucial requirement for ground defence of air assets, albeit in a rudimentary and completely *ad hoc* manner.[1]

This development of armoured cars and their first successful use in cooperation with aircraft led the Admiralty to call for the manufacture of 'cars for attending machines'. Churchill, then First Lord of the Admiralty, enthusiastically endorsed the concept. In an exceptional example of a rapid and timely response to changing tactical need, an RNAS Armoured Car Force of some fifteen squadrons based around the armour-plated Rolls-Royce chassis was quickly created. However,

As CAS, Air Mshl Sir Hugh Trenchard, saw the armoured cars as integral to the Air Force Scheme of Control.

with the onset of trench warfare and a rigid front line the force quickly lost its role. After a brief sojourn to the Dardanelles the cars were mostly transferred to the Army with many ending up in the Middle East theatres.[2]

Air Control

With the end of the Great War, and the financial exigencies required by the Exchequer, the Royal Air Force faced the very real threat of being re-absorbed into the Army and Royal Navy. However, by 1 October 1922, the Royal Air Force had assumed responsibility for military operations and civil control over the territories of Palestine, Transjordan, and Mesopotamia (Iraq) under a mandate from the League of Nations. A key reason for the selection of the RAF for this task was that the Chief of the Air Staff, Air Mshl Sir Hugh Trenchard, had been able to make both a sound fiscal case that the RAF could perform the task at significantly lower cost than the competing bid from the War Office but was also able to provide evidence that the RAF Scheme of Air Control was extremely effective. Fortuitously, a force consisting of a few RAF aircraft, supporting a small ground force, had only recently dealt successfully with an uprising in British Somaliland by the so-called 'Mad Mullah'.

The proposal was that the RAF could control the new mandates with four battalions of infantry, eight flying squadrons, four to six armoured car companies, a few gunboats and a locally-raised force of levies. The Army component had been inserted as a stop gap until such a 'short' time that the scheme had been tested and found to be effective.[3]

Formation and Rationale

Trenchard's first proposal intended that the Army should provide the armoured car force, which had been dealing with a bloody and costly uprising in Iraq since the end of the Great War. Trenchard stated in his plans:

> ‘It must be clearly understood that the provision of armoured car and tank companies are (*sic*) an integral part of the Air Force Scheme of Control.’[4]

Why armoured cars? Although commonly described as ‘Air Control’, the military theorist, Basil Liddell Hart more correctly described the RAF plans as ‘Air-and-Armour Control’ and to quote him:

> ‘It substituted mobile control by a combination of fast-moving, air and ground units for static control by infantry – a concentrated power of quick intervention replacing a widely-spread garrison. The RAF could not fulfil its new police function without the help of units on the ground . . .’[5]

However, the War Office and particularly the Chief of the Imperial General Staff, General Sir Henry Wilson, were to be wilfully unhelpful. Wilson stated that the RAF would have to do without an armoured force; the Army were not empowered to help them, their forces were fully committed in Ireland, fast light tanks were more suited to the desert than armoured cars, but were not yet in production, as it was the Army intended to withdraw its armoured car companies from Iraq and redeploy them to India, none of the Army personnel serving in the Armoured Car Companies in Iraq wished to transfer to a corresponding RAF unit, and the RAF could not draw on any of the Army stock of Rolls-Royce armoured cars.[6]

Undeterred, Trenchard set about constructing his own armoured cars and training the crews which were to be drawn from the ranks of the RAF. The construction and operation of armoured cars was not a difficult task for the RAF. It had modern and efficient workshops, and well-trained armourers, fitters, mechanics and drivers.[7]

Two groups were brought together to form the companies in very different locations. The first tranche gathered at RAF Heliopolis in Cairo. The airmen began training in earnest on vehicle mechanics, desert driving, weapons training and drill. A second group was drawn together at RAF Manston in Kent. The former group would form Nos 1 and 2 Armoured Car Companies and would deploy to Palestine. The latter group would form an Armoured Car Wing with Nos, 3, 4, 5 and 6 Companies, and after a long voyage arrived in Iraq to garrison RAF

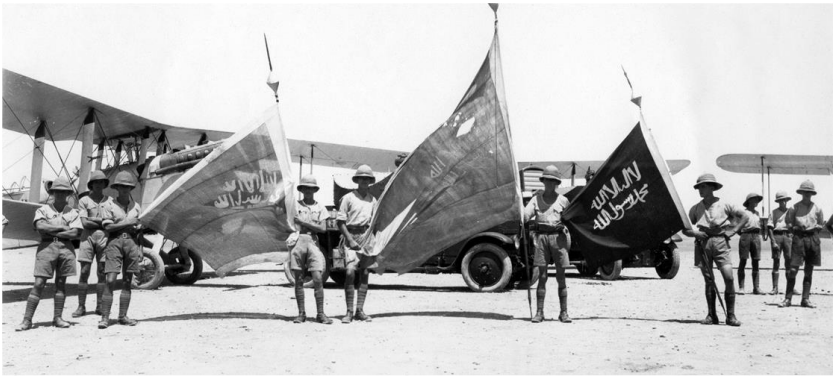
airfields at Basra, Baghdad, Kirkuk and Mosul. Airmen were drawn from serving RAF aircrafthands, others were ex-RFC and RNAS fitters who had re-enlisted, some were ex-Army gunners and infantrymen, and also a contingent of demobilised 'Black and Tans' and Irish 'Auxiliaries', who were clearly keen to leave the newly created Irish Free State.[8]

Most often during this period the officers were drawn from the pool of pilots who were to be given a two-year break from flying duties. Many were decorated ex-RFC or RNAS pilots. Some disliked the posting as it took them away from flying, others enjoyed the relative freedom of action and relished life in the desert. In the latter half of the 1930s, the officer pool began to change. With the demand for pilots to rebuild the RAF in response to the rearming of Germany, the majority of new officers were to be drawn from those who had failed their flying training.

Tasks

The tasks of the RAF Armoured Car Companies were many and varied: reconnaissance expeditions known as 'reccos'; patrolling the mountain roads and deserts; preparing 'going' maps; protecting airfields; protecting supply convoys; 'showing the flag'; providing aid to the civil power, escorting government and military VIPs and coordinating ground and air operations. They operated in all the regions of the mandates and lived up to the unofficial Arabic motto of the Iraq companies of '*Fi Kull Makáan*' or 'In Every Place.'[9]

The RAF armoured car companies were involved in many campaigns from 1921 to 1939: dealing with the centuries' old tradition of Bedouin raiding in both Transjordan and Western Iraq; halting incursions by Turkish irregular forces across the disputed northern borders of Iraq and, from 1924 until 1931, defeating repeated attempts by the Kurds, led by the indomitable and charismatic Sheikh Mahmud, to establish an independent Kurdish state in Northern Iraq. I will, however, discuss three campaigns where the RAF armoured car companies played crucial roles. In one case ensuring the security and existence of the newly-formed country of Transjordan, later Jordan, secondly the protection of the tribespeople of the Southern Desert of Iraq and, finally, maintaining civil order during a long and vicious insurgency in Palestine.



Captured Wahhabi battle banners. (RAF Regiment Heritage Centre)

Transjordan – August 1924

On 14 August 1924, Amman, the capital of the fledgling state of Transjordan was threatened by a force of 5,000 fanatical Wahhabis or Al-Ikhwan (the Brotherhood) which had emerged from the deserts of Central Arabia, later Saudi Arabia, and were determined to wreak vengeance on a people they consider to be lax and unorthodox in the practice of the Muslim faith. A force of a few DH 9A aircraft, known as Ninaks, of No 14 Sqn and three Rolls-Royce armoured cars of No 2 Armoured Car Company were sent out to confront the near four-mile-wide formation of camel-riders and horsemen. Following attacks by the aircraft, the raiders coalesced into a large mass. A poor tactical decision. For the next two hours, and with astute handling by the Section Commander, Flt Lt Thornton, the three Rolls-Royces subjected the column to their intense firepower from Vickers and Lewis machine guns. Following this, the refuelled and rearmed Ninaks returned and the raiders fled from the battlefield. Some 500 of their number had been killed or badly wounded and 300 were prisoners. The Wahhabis had been completely routed. Their captured battle banners shared between the Emir Abdullah, the ruler of Transjordan, No 14 (Bomber) Squadron and No 2 Armoured Car Company. As a consequence, the Ikhwan never returned to threaten Amman and the borders of Transjordan.[10]

Southern Desert of Iraq – 1923-1930

Perhaps having learned a severe lesson the Ikhwan never attempted

to attack in such large numbers again. They now, however, turned their attention to the Southern Desert of Iraq, and the Bedouin encampments and their flocks of grazing animals.

The raiding by the Ikhwan tribes continued from 1923 until 1930 with varying intensity carried out with characteristic religious fervour and for economic gain. They were also a proxy for the destabilisation of the Hashemite crown of Iraq by King Ibn Saud of the Saudi Royal family in Saudi Arabia. With an area of some 45,000 square miles, the problem for the RAF was to predict the location, size and objective of the raiding parties. Now well aware of the firepower of the RAF, the raiding parties moved before dawn, attacked their chosen victims and were back across the Saudi border before the RAF and the Iraqi police and military authorities could react. The Iraqi tribes became reluctant to move further south into their winter pastures for fear of attack. Most of the maps required to support RAF operations were, however, grossly inaccurate or incomplete but by a combination of air and ground survey, the latter by armoured car personnel, the maps were improved considerably. By 1924, Nos 3 and 4 Armoured Car Companies were sending out parties to report on track conditions and to dig trenches to provide air-ground marks to guide pilots on desert reconnaissance. Few successes were however to be had against the raiders. A particular frustration for the first three years of this campaign was that the RAF was forbidden, by agreement with the Saudis, to approach the southern border with Saudi Arabia or indeed pursue parties across that border.

The intricacies of negotiations between the Iraqi and British governments and Ibn Saud are far too tortuous to discuss in this article, however, by 1927 it had become apparent to Ibn Saud that the zealous Ikhwan had become a threat to his own throne and the RAF were given permission to close up to, and cross, the Saudi Arabian border in pursuit of the raiders.[11]

There was now clearly a need for advanced bases where the Iraqi Army and police and the RAF aircraft and armoured cars could respond more rapidly to protect the tribes. On 8 January 1928, an advanced headquarters of what was known as ‘Akforce’ was set up at Ur Junction, under the command of the Chief Staff Officer Iraq Command, Air Cdre T C R Higgins.[12] His force was composed of four columns; two each with a flight of aircraft and two to three sections of

'Ninaks' of No 55 (B) Sqn and RAF armoured cars await action at the forward landing ground at Rukhaimiyah in the Neutral Zone of Southern Desert, Iraq. (RAF Regiment Heritage Centre)

armoured cars as well as supply and reserve columns. The RAF operated from advanced operating bases deep in the desert. Temporary bases were pushed even further out. The RAF armoured cars played a crucial role, moving out to the bases to ensure they were clear of their adversaries and then signalling to the aircraft that they could fly in. Supply aircraft then arrived to deliver stores, ammunition and equipment. The armoured cars also provided escorts to supply convoys coming overland.[13]

One of the most effective of these deployments was when a flight of No 55 Sqn and two sections of Rolls-Royce armoured cars, armed Fords and Rolls-Royce W/T tenders were sent to Rukhaimiyah in the neutral zone on the border with Saudi Arabia. 'Ninak' aircraft and the armoured cars were soon despatched to attack a raiding party that had been sighted. Resistance to bomb and machine gun was futile and they soon surrendered to the armoured cars before they had suffered any serious loss of life.

It would be February 1930 before the troublesome tribes were defeated and would only come through cooperation between the Iraqi and Saudi governments. With nowhere to seek refuge and fearing reprisals from Ibn Saud, the Ikhwan surrendered in large numbers to the RAF. The agreement with the Saudi King was that the tribes must, however, be returned to him. The tribes were thus shepherded back across the border by the armoured cars and handed over to the Saudis. Other groups were defeated in battle by Ibn Saud's forces, and the leaders thrown in jail.

The RAF armoured cars had played a major role in a near six-year long campaign. An official report written at the time emphasised the benefits of combined operation of RAF aircraft and armoured cars. It stated:

> '. . . it is interesting to note the moral effect resulting from the use of aircraft and armoured cars. The constant harassing by armoured cars both day and night and the frequent presence of aircraft overhead, culminating in the dropping of very few bombs proved sufficient.'[14]

A last and telling quote is that from Feisal al Duweesh, the most famous of the Ikhwan leaders, who, in giving the order for retreat said;

> 'We must pass Uqubbah before daylight, or the armoured cars may come.'[15]

Palestine – 1929 and 1936-1939 'In Aid of the Civil Power'

The first serious problems in Palestine arose in 1929, when increasing tensions in Arab society due to rising Jewish immigration lead to outright conflict. At this time, the RAF Palestine and Transjordan Command consisted of only 440 officers and airmen, 12 aircraft and 12 Rolls-Royce armoured cars. Despite their small numbers, the RAF and its armoured cars were heavily committed to deal with rioting, incendiarism and looting directed against Jewish interests and the Army and Navy both had to send reinforcements to aid the small RAF command.

By 1936, however, the Jewish population had reached nearly 400,000 and the Palestinian Arab population were protesting this large influx, fearing for their economic survival and their holy sites. In April 1936, a national strike declared by the Arab Higher National Committee demanded a cessation of Jewish immigration and prohibition of land sales to Jews. While initially starting with rioting and civil disobedience, the disturbances soon moved to assassination, terrorism and sabotage and finally reached a climax a few months later with a long period of guerrilla warfare.

The role of the RAF armoured cars in Palestine would be very different from the operations in the deserts of Transjordan and Iraq. Internal security operations 'in aid of the civil power' necessitated cooperation, often with motorised infantry and other arms in close

Palestine – Civil Unrest and Insurgency. The crew of an RAF armoured car keeps watch over an Arab gathering. (RAF Regiment Heritage Centre)

country. Marshal of the Royal Air Force Sir Arthur 'Bomber' Harris, then AOC Palestine & Transjordan, noted the following however in his memoirs:

> 'My advice to all young commanders in all the Services is, whenever you see any prospect of being called out 'in aid of the civil power' in any part of the world, to get the hell out of there as quickly and as far as you can.'[16]

No details existed in any of the War Office, Cavalry Training and Armoured Car Training manuals and many of the necessary tactics for future counterinsurgency operations were to evolve during this campaign. The tasks of the RAF armoured cars were numerous. They were: to act as a mobile striking force in cooperation with motorised infantry; to patrol roads and railways; to escort motorised infantry columns, civilian columns and Naval gun detachments; to act as mobile flank guards during village search operations and to escort both civil and military VIPs. The tactical unit was generally a half-section of two Rolls-Royce armoured cars, a W/T tender and a supply tender. With the size of the task No 2 Armoured Car Company were soon joined by two sections of No 1 Company from Iraq.

A detachment of armoured cars and its support vehicles heads off into the 'the blue' on a desert 'recco'. (RAF Regiment Heritage Centre)

One clear innovation was the further development of air cooperation. Following a conversation between a Flight Commander from No 6 Squadron and a flight lieutenant of No 2 Armoured Car Company, a scheme was created to facilitate rapid air support to ground forces by high-readiness aircraft located in each of four air support zones across Palestine. This was enabled by RAF armoured car company W/T tenders, later known as *Rodex* vehicles, travelling with each motorised column and convoy. Once resistance was encountered they would send a special code. A single letter denoted a major road, a number the last kilometre post passed, and then the letters 'XX' for air support alone or 'GG' for the intervention of a local ground-based striking force. Numerous examples exist of effective cooperation between the aircraft and armoured cars.[17]

Despite these successes, it was apparent that the insurgency task of the RAF in Palestine was too great to deal with on its own and eventually the responsibility was moved from the Air Ministry to the War Office. Aircraft still played an important part, as did the RAF armoured cars. The latter's operational experience with armoured cars was highly valued as evidenced by many letters of appreciation from Army formation commanders to which they were attached and by the award of four Military Crosses and a Military Medal to armoured car personnel. Of course, by 1939 the Palestine problem had not been resolved, however the RAF armoured cars had been a key asset in the maintenance of civil order as best summed up in the words of General

A Canadian-built Otter of No. 2908 Field Squadron in Athens, 1944.
(RAF Regiment Heritage Centre)

Wavell, GOC Palestine, who said:

> 'Dealing with the rebellion was a very unsatisfactory and intangible business, and I don't think I produced any better answers than anyone else. But I think I kept within bounds and did as much as I could with the troops available.'[18]

Transition to the RAF Regiment

With war declared in 1939, the two remaining RAF Armoured Car Companies went on to fight in the North African campaign and, most crucially, in the Iraq Revolt and against the Vichy French in Syria. As early as September 1942, there had been a proposal that the RAF Armoured Car Companies be absorbed into the RAF Regiment. The absence of a higher formation to control training, planning for replacement of crews and vehicles, and of a main base for refitting and retraining was a serious problem and the Companies struggled to find a clear war role once the fighting had moved away from the Middle East.[19]

By the final year of the war, the RAF Regiment had formed a total of six armoured squadrons for service in North-West Europe following D-Day. The Armoured Car Flights of RAF Regiment Field Squadrons had deployed to Italy and Greece and had been used

productively in a number of roles similar to those performed by the Armoured Car Companies. It was therefore inevitable that the two Companies would either be disbanded and disappear altogether from the RAF Order of Battle, or that they would be absorbed into the RAF Regiment. The sensible decision was made, though causing considerable disquiet in some RAF circles, that they would become part of the RAF Regiment and by February 1947, they were known as Nos 1 and 2 Armoured Car Squadrons RAF Regiment. The battle honours and history of the Armoured Car Companies are now proudly held by those two Regiment Squadrons.[20]

Some questions on the RAF armoured cars between the Wars

As this symposium is being held to commemorate the 75th Anniversary of the formation of the RAF Regiment we might ask some questions relating to the Armoured Car Companies and the development of RAF ground defence doctrine. Between 1921 and 1939 the RAF had gained considerable experience operating in harsh environments and in mobile operations from advanced landing grounds. Despite this, when the North African campaign began in mid-1940, the RAF in Egypt was still very much a non-mobile organisation. Because of its operational experience, No 2 Armoured Car Company was employed in the first campaign as an Army cavalry reconnaissance unit alongside the 11th Hussars, not as an RAF force protection asset. Despite all the work of the last twenty years between the Wars, it seems that in North Africa and in the United Kingdom, the role of the RAF armoured car companies had had little impact on the development of doctrine on ground defence in the RAF and particularly when the Advanced Air Striking Force was deployed to France in 1940. What is interesting is that once the RAF moved from the geographical confines of the League of Nations Mandates, ground defence became the primary responsibility of the Army, with a few immobile RAF Ground Gunners trained to provide low-level anti-aircraft defence from Lewis guns.

Epilogue

On Sunday 3 September 1939, following Germany's refusal to withdraw from Poland, Great Britain and its Empire declared war. In Palestine, at 0600 hours, the following day, a Rolls-Royce armoured car and Fordson tender, were assigned as an escort to a RAOC

breakdown vehicle on the Hebron-Beersheba road. At Kilo 40, the tender detonated a mine and the front of the vehicle was blown apart. AC1 Lloyd was fortunate to be only slightly wounded, but LAC Geoffrey Slade was fatally injured and was buried a few days later at the Ramleh War Cemetery. LAC Slade was the first fatal casualty to be suffered by RAF Middle East Command in the Second World War.[21] His death was not the result of enemy air action, air crash or accident but the result of ongoing terrorism in Palestine and was caused by a terrorist-made improvised explosive device. A portent of wars to be fought not in the next five years, but for the next 70 years and into the future.

Notes:

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2 Raleigh, W; *The War in the Air, Vol I* (Oxford: Clarendon Press, 1922) p376.
3 Warwick, N W M; *In Every Place. The Royal Air Force Armoured Cars in the Middle East 1921-1953* (Rushden, Northants: Forces & Corporate, 2014) pp3-5.
4 TNA AIR 5/477; *Memoranda on RAF scheme of air control Iraq (Mesopotamia). 1921.*
5 Liddell Hart, B H; *The Tanks, Vol I* (London: Cassell, 1959) pp208-09.
6 Warwick, *op cit*, p6.
7 Boyle, A; *Trenchard: Man of Vision* (London: Collins, 1962) p388.
8 Warwick, *op cit*, p21.
9 Godsave, G E; *Fi Kul Makáan*, ed. K Oliver (Unpublished manuscript). RAF Regiment Archives.
10 Warwick, *op cit*, pp39-45.
11 Glubb, J B; *War in the Desert* (London: Hodder & Stoughton, 1956) and Warwick pp96-141.
12 In February 1942, Higgins was appointed as the first Commandant of the RAF Regiment Depot.
13 Warwick, *op cit*, pp114-125.
14 TNA AIR 23/624; *Southern Desert Operations, South-East Area, Nov 1929-Jan 1931.*
15 Glubb, *op cit*, p270.
16 Harris, A; *Bomber Offensive* (New York: MacMillan, 1947) p30-31.
17 Warwick, *op cit*, p221.
18 Quoted in Connell, J; *Wavell, Scholar and Soldier* (London: Collins, 1964) p197.
19 Warwick, *op cit*, pp482-483.
20 Oliver, K; *Through Adversity: The History of the RAF Regiment* (Rushden, Northants.: Forces & Corporate, 1997) pp178, 285.
21 TNA AIR 29/54; *2 Armoured Car Company Operations Record Book.*

THE RAF REGIMENT AT THE BATTLE OF MEIKTILA

Fg Off Miles Whitehead
(presented by Flt Lt James Lockhart)

Having previously studied history to MA level at York, Miles Whitehead (left) joined the RAF in 2014 and won the Sword of Honour on completion of IOT at Cranwell. With a three-month tour on Op SHADER already under his belt, he is currently stationed at Honington as OC A Flt, No 1 Sqn RAF Regt. Jimmy Lockhart (right) joined the RAF in 2012 and graduated from the formidable JROC in October 2015 with distinction, as had his colleague. He is currently OC A Flt, No 26 Sqn RAF Regt, also at Honington, specialising in CBRN recce and exploitation.

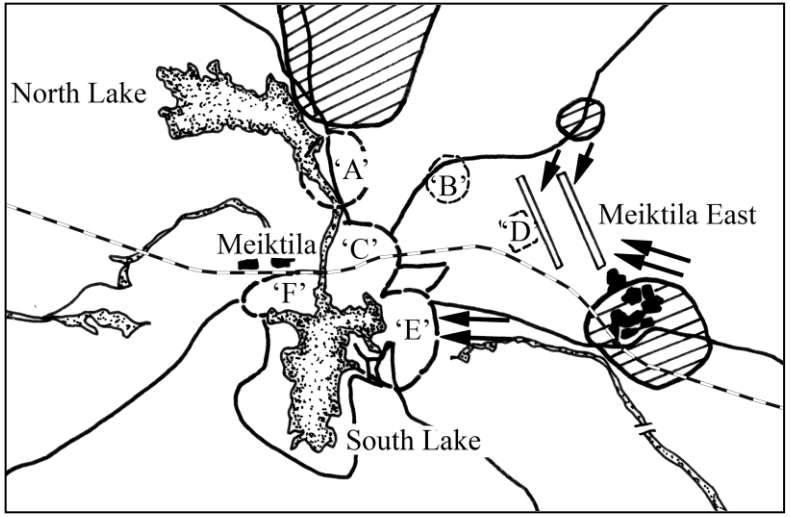
Often known as 'The Forgotten War', the Burma Campaign, fought primarily by the British against the Japanese, has been dismissed as a side show to the war in Europe. However, this not only underplays the very real threat Japan posed to British India, as well as other countries in the region, but is also hugely unfair to the million or so Allied troops who fought in the campaign against a ruthless enemy. After a series of defeats at the start of the war led to the longest retreat in British military history, the forces of the British Empire rallied and pushed the Japanese back in an equally long advance. There were many battles throughout this campaign which were vital to an Allied victory, and one of these was the capture and spirited defence of the vital strategic town and airfield of Meiktila, which was to become one of the RAF Regiment's proudest battle honours.

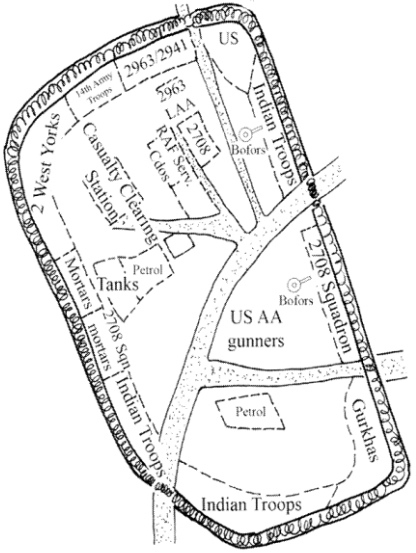
Between 2 and 4 March 1945 British forces fought stubborn Japanese resistance to capture the town of Meiktila, to the south of Mandalay in Burma. This was a masterstroke of tactical thinking by Lieutenant-General Sir William Slim, commander of the British XIVth Army, as this ensured a stranglehold on the main line of Japanese communications and denied them their main supply base for ammunition, stores and hospitals – everything an army needed to operate successfully.[1] Meiktila, in turn, then became a key supply base

RAF Regiment gunners with a 20mm Hispano.

for the British forces, especially the airfield to the east of the town which was needed to protect communications up the Irrawaddy River and to supply the 17th Indian Division on its continued push against the enemy. The Japanese were not slow to recognise the strategic importance of Meiktila and the British defenders, who were surrounded by the Japanese, prepared to defend it against a determined and numerically superior enemy.

Wing Commander C M 'Bill' Lander, OC 1307 Wg was given the task of defending the airfield at Meiktila with the following units: No 2708 Field Squadron, two flights of No 2963 Light Anti-Aircraft Squadron, one flight of No 2941 Field Squadron and one flight of No 2968 Field Squadron. These were all airlifted into Meiktila airfield, which was still surrounded by Japanese patrols, on 1 March, bringing their 20mm Hispano anti-aircraft guns and AMES systems with them, and linked up with the 99th Indian Infantry Brigade.[2] The small arms fire that greeted the RAF Regiment troops on their arrival convinced them that they would need to hold a defensive position at night and move back onto the airfield during the day in order to allow flying operations to continue, so they began to dig slit trenches in a defensive





Left – the disposition of Allied and enemy (hatched) troops around Meiktila and, right, a sketch map, drawn by Sgt N Gerrish MM, showing the occupants of the crucial Box D on the perimeter of the airfield.

Wing Commander 'Bill' Lander briefs RAF Regiment airmen next to a Pagoda, Meiktila.

area known as ‘Box D’ next to the airfield. The RAF were apparently so concerned about the future of these men that they ensured that a padre delivered a last communion to them before they deployed.

From the day of their arrival, the RAF Regiment began patrolling their Area of Responsibility, searching for the Japanese patrols and snipers who were constantly harassing their position. No stranger to leading by example, one of the first patrols was led by Wg Cdr Lander; he was personally involved in the operation at every level and did everything he could to ensure that morale remained high amongst his men. He had soon realised that success at Meiktila would depend on the preparation and resolve of his men and when they arrived at the poorly prepared airfield he warned them that it would be ‘a case of dig or die’.[3]

On 15 March, the airfield suffered its first shelling from 75mm and 105mm artillery pieces; this was to become the norm for the next sixteen days. It coincided with the arrival in the area of the Japanese 17th Guerrilla Company, the 49th Division and two battalions of the 18th Division, battle hardened victors of the campaigns in Malaya and

Sgt Norman Gerrish MM. (RAF Regiment Heritage Centre)

Burma in 1942. The Japanese troops wasted no time in attempting to attack Box D to regain control of the airfield, but they were driven back by the determined defence of the RAF Regiment and units of the British Army. However, they succeeded in establishing themselves so close to the airfield perimeter that they would have to be regularly fought in order to permit flying operations to continue. Therefore, at dawn each day, a RAF Regiment patrol was sent out across the airfield to find, fix and destroy any enemy in the area. This required considerable courage, as the bare airfield offered no real cover and the men were, in effect, presenting themselves as bait to provoke the enemy into revealing their positions.

On 16 March, a two-section patrol, led by Sgt Norman Gerrish, the acting Flight Commander of No 2708 Sqn's No 1 Flight, was sent out to counter an enemy mine-laying patrol. They cleared the majority of the airfield without incident and were being joined by members of another flight under Plt Off Furlong when they came under rifle, light and heavy machine gun, and mortar fire. One of Sgt Gerrish's sections was pinned down in the open, so he seized the initiative and, swapping his rifle for a Bren gun, charged through cover whilst firing from the hip, drawing the enemy's attention away from those stranded in the open. This contact lasted for an hour and a half, during which the RAF Regiment patrol drove the Japanese back 200 yards, giving the trapped section the space they needed to get under cover, before Sgt Gerrish covered the withdrawal of his men. Other RAF Regiment elements under Wg Cdr Lander then counter-attacked, allowing the evacuation of the dead and wounded.[4]

The RAF Regiment lost seven men killed and another nine wounded. When a further counter attack by Sherman tanks of Probyn's Horse, an Indian Cavalry Regiment, pushed through the area, they credited the RAF Regiment with having killed more than fifty of the

enemy. Such an action proved to be fairly typical for the battle and there were many more individual acts of heroism. Unfortunately, for the sake of brevity, these must go unrecorded in this account. Sgt Gerrish, who had been wounded in the leg during this contact, undoubtedly saved the lives of many of his men and he was later awarded the Military Medal in recognition of his efforts.[5]

An RAF Regiment mortar in action at Meiktila.

Similar engagements, fought on a daily basis, permitted vital supplies to continue to be flown in by Dakota and allowed Spitfires and Hurricanes to operate from the airfield. The Dakota crews often landed without knowing for sure whether the airfield was in British hands and had to unload their cargo as quickly as possible, then take off and bank sharply to avoid being hit by enemy fire. This was the only way to bring in supplies effectively and military equipment was the priority, often at the expense of food. This added to the hardships of life in the crowded Box D. The men, living in slit trenches, under frequent artillery bombardment and sniper fire, were quickly reduced to one third of rations and one bottle of water per man per day. Under these conditions, two senior officers who landed one day did little to ingratiate themselves with the men when they demanded to know why they hadn't shaved! However, the airmen and officers of the RAF Regiment squadrons present had little time to reflect on their situation as the Japanese attacks intensified, rather than diminished, as the days went on. A night attack, which was successfully driven back from Box D on the night of 22/23 March, left 103 Japanese dead on the airfield, which provides some idea of the numbers involved in these sorties against the British troops.[6]

The vulnerability of the aircraft using Meiktila airfield was highlighted on 23 March when two Dakotas landed to drop off

supplies and pick up wounded. One of them took off successfully, but the port engine on the second refused to start and the aircraft was stranded in the open; filled with wounded, it soon became a target for artillery fire. Sgt Brown of No 3207 Servicing Commando ran into the open to try to fix the engine, despite pleas for him to take cover. Before long a Japanese anti-tank gun struck the stranded aircraft and Sgt Brown organised the evacuation of the wounded personnel still on board. Meanwhile, a Stinson L-5 attempting to land on the strip was hit and burnt out by enemy fire. A second L-5 landed and again Sgt Brown ran into the open to order the pilot to take off again. Brown was later awarded the Military Medal for these actions.

Morale in the RAF Regiment units was maintained by the inspirational leadership of the officers and NCOs, who consistently went above and beyond the call of duty in order to ensure that their men were safe. This was especially true of Wg Cdr Lander, who frequently put himself in harm's way to demonstrate to his men that he was willing to lead by example. On 24 March, whilst leading a patrol, Wg Cdr Lander was killed by an enemy sniper. The combined effort of an Army Bofors gun and the mortars of No 2708 Sqn quickly destroyed the enemy position, but this was scant consolation for the men who had lost a daring and well-liked Commanding Officer. The RAF Regiment's leadership sustained a further blow on 26 March after a direct hit on the Orderly Tent wounded the acting OC, Flt Lt Wootton, the padre, Sqn Ldr O'Connor and killing the Adjutant, Fg Off Henry; this left just two officers and four SNCOs. The scarcity of commanders meant that at one stage a bayonet charge had to be led by an RAF Medical Officer!

The casualty rate among the 270 Regiment personnel present was high, with one in three being killed or wounded. Despite the heavy rate of attrition among both the officers and the men, their resolve to fight never diminished, even in the face of overwhelming odds, desperate living conditions and a determined and fierce enemy. This dogged defence in the face of adversity paid off when, on 28 March, the siege was lifted. The Japanese finally conceded that they would not be able to retake Meiktila and, by this time, other elements of the British forces had crossed the Irrawaddy, making the Japanese position untenable. Slim's XIVth Army and the RAF's 221 Group could now push south to Rangoon and, after capturing this

strategically vital port from a badly prepared enemy, the Japanese were soon driven out of the rest of Burma.

Lord Louis Mountbatten regarded the RAF Regiment's contribution to the victory at Meiktila as important enough to warrant a specific mention in his official report on the campaign. AOC 221 Group, Air Vice-Marshal Vincent, stated that 'The RAF Regiment proved themselves grand fighters [...] they had a considerable amount of fighting and inflicted very many casualties on the enemy.' This was expanded upon by OC 17 (Spitfire) Sqn, which operated out of Meiktila airfield during the battle, when he said, 'The RAF Regiment won bloody renown in the fierce fighting for repossession of the landing ground every humid morning.'

Having been formed only three years before this battle, it was a true testing ground for the RAF Regiment, who had only really seen action in the North African desert before this and then not usually in their primary role of airfield defence. The aggressive defence displayed by the men of the RAF Regiment squadrons that participated in the battle became a blueprint for future operations by the RAF's ground fighting unit. This same fighting spirit has been evident more recently in the hard-fought campaigns in Iraq and Afghanistan. There, RAF Regiment squadrons conducted aggressive patrols outside the wire to deter the enemy, rather than providing static point defence, thus maintaining a buffer zone outside air bases in order to ensure the smooth running of air operations. Looking towards an uncertain future in an increasingly unstable and unpredictable world, the RAF can rest assured that it still possesses a corps of men who, in the spirit of Meiktila, are ready to close with and destroy any enemy which threatens the safety of its airfields.

Notes:

1 Rooney, David; *Burma Victory, Imphal and Kohima, March 1944 to May 1945* (Cassell Military Paperbacks; 2000) p184.
2 Warwick, Nigel W M; *Constant Vigilance, The RAF Regiment in The Burma Campaign* (Pen & Sword; 2007) p160.
3 Warwick; *op cit*; pp163-4.
4 Warwick; *op cit*; pp167-71.
5 *Supplement to the London Gazette*, 7 September 1945.
6 Warwick; *op cit*; p174.

THE RAF REGIMENT AND THE WITHDRAWAL FROM EMPIRE

Air Cdre Scott Miller
(presented by Gp Capt Richard Langley)

Scott Miller (left) was commissioned into the RAF Regiment in 1987. He seen combat in several theatres, has commanded front-line units in every rank up to group captain and filled operational and strategic planning appointments in various HQs and at the MOD. He is currently Deputy Commandant at the Joint Services Command and Staff College.

Rich Langley joined the Regiment in 1988. He has commanded No 3 Sqn and No 1 Force Protection Wing with operational tours in Northern Ireland, Cyprus, Bosnia, Kosovo, Afghanistan and Iraq. Staff tours have included posts at SHAPE, the PJHQ and various Army and US HQs. He is currently Chief of Staff, Force Protection Force and Deputy Commander RAF Regiment.

The history of the RAF Regiment in, what has become known as, the 'Withdrawal from Empire' is really a pillar in the history of British air power. The Withdrawal was conducted through a period of national economic privation and, at least in the early part of this period, fatigue from the Second World War. The international climate was for decolonisation, supported by many at home and in the territories concerned. The United Kingdom's armed forces, large by today's standards, were nevertheless much smaller than their wartime strength, and were heavily stretched supporting the civilian authorities in the colonies, whilst also contributing to the defence of the West in the Cold War.

Many of the conflicts that act as waypoints for the Withdrawal were stimulated by insurgent or guerrilla groups that saw no benefit in engaging the Army in classic force-on-force fights that they ultimately would lose. The relatively low density of ground forces and the tactics of the insurgent groups led to a premium being placed on air power,

whose capabilities were improving at a fast pace due to the rapid evolution of technology. The RAF steadily improved its own capabilities to move forces quickly to and from troubled theatres of operation, as well as within them and also to resupply forces in the field, whilst improving its ability to gather intelligence on the enemy and then to attack it, either discretely or in concert with other forces.

The growth in reliance on air power by the United Kingdom, whilst it was delivered by decreasing numbers of ever more capable (and expensive) aircraft, multiplied their value and the importance of ensuring they could operate unhindered. The vulnerability of aircraft, aircrew and support equipment, frequently concentrated on large and fixed bases, reinforced the importance of providing adequate defences. The nature of many of the conflicts, devoid of the front lines of conventional wars, often meant that operating bases were as close to the enemy as was anything else. Situations in which it was possible to be based completely away from the threat were few.

The men of the RAF Regiment, and its locally-raised ground forces, thus found themselves engaged in many of the conflicts that punctuated this period. The typical absence of contiguous battle lines, the frequent shortage of ground forces and the capabilities of the RAF Regiment meant that its employment frequently extended beyond ground defence and low-level air defence, but also into more offensive ground operations alongside land and police forces.

Soon after the Second World War ended, violence between Arab and Jewish factions in Palestine re-emerged, with the additional complication of anti-British activity by Zionist terrorists. British forces were too few in number and this was no less true for the six RAF Regiment squadrons that were trying to protect numerous and widely spread RAF installations, including airfields, hospitals, maintenance, signals and radar units. Once the RAF's role in operations to inhibit the arrivals of immigrants became public knowledge, its personnel and installations assumed prime target status, placing great pressure on the RAF Regiment to provide secure operating locations. Inevitably, the highly motivated and organised terrorists created havoc. An early success was the destruction of the Mount Carmel radar station in February 1946. Only a week later, the terrorists mounted coordinated attacks against three airfields, Lydda, Petah Tiqva and Qastina, destroying a total of twenty aircraft.

A Spitfire of No 208 Sqn at Petah Tiqva, one of the twenty RAF aircraft destroyed by the Irgun attack. (Wg Cdr R Bowie)

Denuded of experienced officers and NCOs by the post-war demobilisation, the RAF Regiment's strength in Palestine had also decayed, by July 1947, to the point where only four of the six squadrons were operational. Whilst the reduction in strength of the RAF Regiment units was slower than the rest of the Service, the effect was still significant, and the other two squadrons were little more than number plates. By this point, all RAF aircraft had been concentrated at Ein Shemer airfield under the protection of 20 Wing RAF Regiment, with Nos 58 and 66 Sqns and a flight of No 1 Armoured Car Company under command. Other locations, including Air Headquarters Levant, were also protected by RAF Regiment squadrons.

The RAF had withdrawn to Ramat David airfield by May 1948, and its detachment was covering the final withdrawal of British forces. Soon after first light on 22 May 1948, Royal Egyptian Air Force Spitfires attacked the airfield, initially catching it unawares. The Station's officers were recovering from the previous evening's Dining-In Night, at which much effort had been put into ensuring the airfield's Israeli future owners would not inherit the Officers Mess intact. The first Egyptian attack destroyed two Spitfires on the ground and damaged several others. The next wave resulted in the destruction

of three Dakotas and a hangar. The third had little effect, and five Egyptian aircraft were shot down, one of them by Bren gunners from No 52 Sqn RAF Regiment.

The RAF Regiment was also involved in the United Kingdom's activities in Jordan, where an agreement to provide military assistance to the Hashemite Kingdom, and British obligations to the Baghdad Pact, enabled the RAF to maintain bases at Amman and Mafraq. The creation of the state of Israel caused considerable nervousness in Jordan, especially after Israeli activity near Aqaba. Light anti-aircraft squadrons were kept at readiness at Amman to protect against attacks by the *Heyl Ha'Avir*, the Israeli Air Force, although these did not materialise. Israeli fighting against Jordanian forces along key lines of communication, towards the end of 1950, served as a reminder of the proximity and seriousness of the threat.

By late 1955, internal dissent was growing in Jordan and the United Kingdom initiated Operation ENCOMPASS early the following year to reinforce land and air forces. Whilst the RAF force already in Jordan, which included No 19 Light Anti-Aircraft Wing RAF Regiment at Amman, had not been subject to a significant attack, there was a risk that this situation could quickly change. Consequently, No 5 Light Anti-Aircraft Wing RAF Regiment was deployed at short-notice by air from Habbaniya on 12 January 1956.

The situation in Jordan remained tense throughout the spring of 1956, and then worsened following the King of Jordan's dismissal of General Glubb, which was one of the protestors' early demands. At the beginning of May, tension eased to the point where some of the reinforcements could be withdrawn to Cyprus. However, the Suez crisis in October-November 1956 led to a resurgence of the threat to British forces in Jordan and, in response, numerous forces were deployed from Cyprus. No 19 Light Anti-Aircraft Wing RAF Regiment once again found itself at a high state of operational readiness to repulse attacks at Amman and Mafraq. The situation at the latter practically constituted a state of siege. Withdrawal of British forces from Jordan became a political inevitability and by 31 May 1957, the withdrawal from Mafraq and Amman was complete. Although the RAF was to return to Jordan briefly in 1958 following the formation of the United Arab Republic between Egypt and Syria, this did not feature the RAF Regiment in great numbers.

Flt Lt J L Birch was posted to the Iraq Levies as late as April 1955, probably the last RAF Regiment officer to join them.

To some extent, the RAF Regiment's role in the Withdrawal from Empire was presaged by the role of the armoured car companies in the air policing role, and the involvement of the associated forces which were active under RAF control. In the case of the RAF Levies (Iraq), this commenced in 1933, but the United Kingdom's time in Iraq was to come to an end in 1955. These were difficult times for the United Kingdom in the Middle East and in Iraq in particular. Plans had been drawn up for a force comprising eight squadrons of Levies, which were to be provided with officers by the RAF Regiment, but these had to be abandoned. The Levies (Iraq) paraded for the last time at RAF Habbaniya; fittingly, this was the scene of heroic actions by No 1 Armoured Car Company and Levies in 1941. Doubtless, some at the time predicted that no good would come to Iraq and that the RAF Regiment ultimately would return. They may have been surprised by the frequency and duration of those visits. In addition to Operation GRANBY in 1990-91, the United Nations Iraq-Kuwait Observation Mission, and Operation TELIC in 2003-2011, RAF Regiment personnel have been involved in the more recent Operation SHADER in Iraq against Daesh.

Two years later, in 1957, the RAF began to hand over responsibility to the Army for the Aden Protectorate Levies. These had been established in 1928, as a consequence of the doctrine of Air Control, but circumstances in the Aden Protectorate and at home increasingly rendered the doctrine unsuitable. The threat had evolved a great deal in the 1950s with a combination of Yemeni-inspired factions that were opposed to rule by the United Kingdom and, in

The member of the Camel Troop of the Aden Protectorate Levies and a Venom.

A Rock Ape.

many cases, by anyone else. The Aden Protectorate Levies found themselves undertaking a range of operations for which they were not suited. There was some hope that the situation could be shored-up with increases in the capability of the local armoured car squadron and by the deployment of RAF Regiment squadrons. However, the problem was too great for these forces to manage and the British Army took over, transforming the Levies over time into the core of the South Arabian Army.

Two RAF Regiment officers of the Aden Protectorate Levies were the cause of the RAF Regiment's 'Rockapes' nickname, thanks to an incident at Dhala in the Western Aden Protectorate in 1952. One officer shot and wounded the other, Flight Lieutenant Mason, during a hunting expedition to shoot baboons, which were known locally as rock apes, having assumed in the dusk that his colleague from whom he had separated was in fact one of their prey. The admission that an RAF Regiment officer was so easily confused with an ape quickly spread and found a ready home in the Service's traditions.

The post-Second World War deployment of RAF units to the Far East, particularly to Hong Kong, Malaya and Singapore, in the face of a growing threat from both state and non-state Communist forces, necessitated defensive measures to protect from ground and low-level air attack. Cost and lack of available RAF Regiment units led to the

NCOs of the RAF Regiment (Malaya).

formation in 1947 of the RAF Regiment (Malaya) drawing on Malayans to provide the vast majority of its officers, NCOs and men. These served under very similar terms and conditions of service as their British RAF Regiment counterparts. Unlike the other two associated forces raised to serve the Air Control doctrine, the RAF Regiment (Malaya) was specifically raised for the same core defensive functions that were performed by the RAF Regiment. Consequently, its organisation and equipment scales were along very similar lines including latterly, for three squadrons, 40mm Bofors L70 guns for the low-level air defence role.

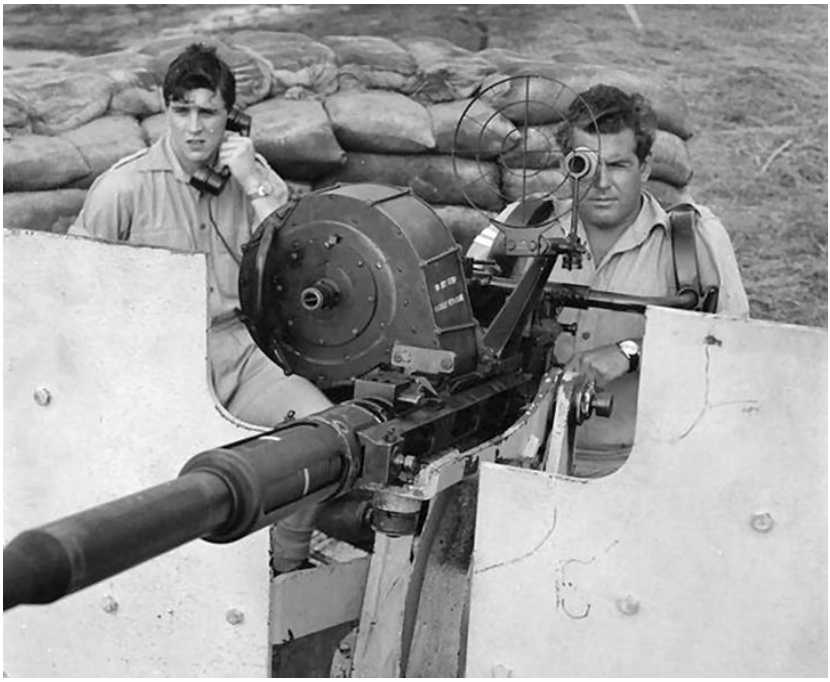
The six squadrons of the RAF Regiment (Malaya) served in all three colonies, but the expected threat to air installations did not materialise during its existence. Consequently, the squadrons frequently were employed alongside land forces counterparts on counter-terrorist operations in the rainforest and rubber plantations of Malaya. Unaffected by rotation through short operational tours, as were British units, they gained a vast amount of experience and, in turn, had notable success against the Communist Terrorists. An indication of how heavily engaged were the squadrons can be found in the commitment through the first phase of the Malayan Emergency in 1948 and 1949 to offensive operations in Pahang, Perak, Selangor, Kedah, Negri Sembilan, Johore and Malacca provinces. This activity contributed to the inability of the Malayan Races Liberation Army to conduct large scale operations and forced it to change tactics, ultimately limiting its effectiveness and setting the conditions for its ultimate defeat.

The RAF Regiment (Malaya) was disbanded at the end of the Emergency, and its personnel retired or were transferred to what was then the Army of the Federation of Malaysia. It was only a few years later though that Confrontation with Indonesia required RAF

Left – the Commandant General of the RAF Regiment, AVM Bernard Chacksfield, inspecting a Bofors gun crew at Bukit Gombak (Singapore) during the Confrontation with Indonesia.

Regiment units to be deployed from the United Kingdom and the Middle East Air Force to protect Far East Air Force units.

Indonesia saw an opportunity to gain more territory in the 1962 creation of the Federation, particularly in Eastern Malaysia in Borneo. Indonesia's aggression stimulated an increased requirement for defensive forces in Malaysia. Three light anti-aircraft squadrons were deployed to Changi and Tengah in Singapore and to RAAF Butterworth, near Penang in September 1964. These bases enabled the rapid increase in the strength of fighters, bombers, transport aircraft and helicopters from the RAF, RAAF and RNZAF. The nature of the threat and importance of the assets necessitated that the RAF Regiment squadrons were augmented by Royal Artillery and Royal Australian Artillery anti-aircraft batteries to provide defensive depth. The RAF Regiment squadrons were deployed to their fighting positions for 23 months, with readiness held throughout daylight hours and for seven days a week. Along with the deployment of air defence



A 20mm Oerlikon 'somewhere in Borneo'.

fighters and Bloodhound surface-to-air missiles, this had a significant effect on the Indonesians, undoubtedly deterring air attacks and a concomitant escalation of the conflict.

Impressive as this achievement was, the forward areas in Borneo imposed an even greater level of rigour. In addition to far more austere operating circumstances, forward operating bases at Labuan, Kuching and Tawau did not have the benefit of Bofors-equipped light anti-aircraft squadrons. In an echo of the Second World War, the RAF Regiment sourced former Royal Navy 20mm Oerlikon cannon, in this case training themselves on the weapons at sea, using RAF rescue launches, before training RAF tradesmen at the forward operating bases in their use for last-ditch protection against Indonesian air attacks.

As allied land forces pursued Indonesian forces through the jungle, so air mobility became a very important enabler in Eastern Malaysia. Jungle airstrips became vital ground, and No 15 Sqn, RAF Regiment,

nominally based at Seletar on Singapore, maintained a continual presence on airstrips along the Indonesian border. The threat was sufficiently severe as to require the squadron frequently to engage infiltrators with medium mortar fire. Personnel from the squadron also manned machine guns on the RAF's support helicopters, and assisted with a range of other tasks enabling the air and ground crews to focus on maintaining maximum serviceability in a challenging tropical environment.

Back in the Near and Middle East, the United Kingdom was becoming increasingly concerned by Nasser's strident pan-Arabism, his efforts to frustrate Britain's influence in the Middle East, and his nationalisation of the Suez Canal. A manufactured pretext saw the Israeli invasion of the Sinai, on 29 October 1956, which was followed on 31 October by Operation MUSKETEER (the United Kingdom's code name), starting with offensive air operations by British and French aircraft. Those operations were imaginative and executed well. Attacks against Egyptian air power and key command and control facilities sought to disable the adversary's principal threat and its ability to respond. The pattern was to be repeated, with increasing precision and success, in a number of subsequent conflicts, in the Gulf and in the Balkans.

Despite the protestations of many, including Lord Louis Mountbatten, then First Sea Lord, the ground phase of the operation commenced with an airborne assault on 5 November 1956. A key objective was Gamil airport and, the following day, advance elements of No 215 Wing RAF arrived to take begin taking control. It was accompanied by an advance party of No 48 Sqn RAF Regiment. The balance of the squadron arrived the following day to relieve the 3rd Battalion of the Parachute Regiment, which had captured the airfield, completing this task on 8 November. The squadron deployed by helicopter from HMS *Ocean* on which it had been embarked. The situation at Gamil was far from perfect, as No 215 Wing had a very limited establishment and the capacity to handle fewer than ten aircraft per day. However, in the short period it was deployed, it handled over three hundred. No 48 Sqn's contribution was judged to have been pivotal in preventing the Wing from failing.

The squadron was probably inured to the chaotic situation, given that its build-up to the conflict was hardly a model of good planning.

For the Suez operation, the RAF Regiment was ferried ashore by helicopters operating from HMS Ocean.

It involved the squadron being converted to the light anti-aircraft role, only to revert on completion back to the field role. Shortly before it embarked, it was ordered to leave its 3″ medium mortars behind, which could have proved disastrous had the threat at Gamil been greater.

Nos 63 and 194 Sqns RAF Regiment were also directed to deploy but they had made it no further than Malta before the ceasefire. No 63 Sqn remained in Malta, whilst No 194 Sqn moved on to Cyprus where the RAF Regiment's light anti-aircraft squadrons had also been deployed at the main operating bases, with Royal Artillery reinforcements. Whilst the Suez crisis was developing, No 62 Sqn RAF Regiment deployed from RAF El Adem in Libya to forward observation positions to protect the base from attack by Egypt, which was only sixty miles to the east.

No 48 Sqn RAF Regiment held Gamil until 15 November when it was relieved by two companies from the Argyll and Sutherland Highlanders, allowing it to deploy well beyond the perimeter to defend the western approaches to the airfield. The airfield was handed over to the United Nations force on 20 December and all allied forces had been withdrawn from Egypt by 22 December.

Cyprus had been a key element in the Operation MUSKETEER plan, and its strategic importance to the UK in this and other operations, particularly for the projection of air power, meant that the RAF Regiment was to become very familiar with the island. During the build up to the Suez Crisis, Nos 3 and 5 Light Anti-Aircraft Wings RAF Regiment were deployed in defence of the airfields at Akrotiri, Nicosia and Tymbou, the latter being re-opened after some emergency repairs to its dilapidated runway. In addition, the wings provided defence to power station, fuel depot, port and signals units. The sixty guns of the two wings were insufficient for the task and Royal Artillery Bofors gun-equipped batteries were taken under command. However, the neutralisation of the Egyptian Air Force in the early hours of MUSKETEER ultimately negated the threat of an air counter-attack against the United Kingdom's bases on Cyprus.

A little earlier, in 1954, the politics of Cyprus morphed with increasing calls, from some part of the Cypriot community, for *Enosis* – the incorporation of the island as part of the Greek state. The United Nations did not approve the change of status for Cyprus and on 1 April 1955, EOKA (the Greek Cypriot guerrilla group) burst onto the scene with a series of bomb attacks against Government targets across the island. The attacks had been anticipated with increased security and no casualties were suffered. In early 1955, an RAF Regiment Wing, with two light anti-aircraft squadrons under command was deployed to RAF Nicosia from Egypt, as part of the withdrawal from that country and to provide enhanced security against the EOKA threat. These were followed over the next year by two more wing headquarters and three more light anti-aircraft squadrons.

Attacks continued, despite air and sea operations to deny the flow of arms to the island, and 1956 saw airmen murdered and injured and the destruction in March 1956 of a civilian aircraft that had just completed a trooping flight into Nicosia airport. An attack on Akrotiri in June saw the detonation of a number of improvised explosive devices that had been placed inside the airfield and which resulted in considerable damage. A number of casualties were inflicted in a later attack against airmen's recreational facilities at RAF Nicosia.

The light anti-aircraft squadrons were not well prepared for the internal security role and many lessons had to be learned or re-learned. This process was doubtless assisted by the deployment to Cyprus of a

An EOKA bomb at Akrotiri on 27 November 1957 caused a hangar fire that resulted in four Canberras being written off.

field squadron from RAF Habbaniya. Inevitably, the Suez Crisis forced a temporary return to an emphasis on gunnery skills with the Bofors guns, but it says much for the quality of the RAF Regiment's training systems that it made the transitions between roles quickly, even with predominately National Service personnel of limited experience and often limited motivation.

Whilst operations against EOKA continued, there was a high demand for extra capacity to conduct operations in support of land forces. On one occasion in 1957, No 3 Light Anti-Aircraft Wing RAF Regiment, with three squadrons under command, relieved a Royal Marines Commando on operations in the mountains in the centre of the island. In return, the Commando took over responsibility for defence of RAF Akrotiri. Regrettably, the Royal Marines did not prevent an improvised explosive device attack that destroyed a number of aircraft and ground support equipment. Subsequently, defence of RAF installations was not ceded to other units.

Operations continued against EOKA until 1959, after which Cyprus was granted independence and the Sovereign Base Areas were

established. Despite these changes, unrest and violence between the ethnic Greek and Turkish communities were to continue into the 1970s. This was to ensure that the RAF Regiment was heavily occupied in protecting RAF installations and supporting land forces operations. As an aside, the defence of RAF Akrotiri also involved depth protection of the United Kingdom's nuclear weapons based there and which first arrived in 1961. The Cape Gata Supplementary Storage Area was designed to store up to thirty-two 15-kiloton RED BEARD free-fall weapons, representing an important element of the country's strategic arsenal. The question of these being based on Cyprus, albeit on British soil, was hugely politically sensitive and there was no tolerance for security lapses.

In 1964, United Nations forces were deployed to the island to keep the peace in the face of what was essentially a civil war between the two populations that had started in the previous December. At this time, the majority of RAF elements were based at RAF Akrotiri. Air traffic control facilities remained at Nicosia and surveillance radar was located on Mount Olympus. The RAF Regiment's contribution included two light anti-aircraft squadrons (complementing a Bloodhound surface-to-air missile squadron) and two field squadrons.

Inter-communal fighting had broken out on 21 December 1963 and RAF Regiment units were deployed to protect British subjects. Within a week, the United Kingdom moved to stem the violence, and one of the first tangible measures was the deployment of No 3 Wing RAF Regiment to Nicosia. By 29 December, the Wing had four squadrons under command. In due course, the Officer Commanding, Wg Cdr Mark Hobden, famous for creating the Green Line, added a further four Army sub-units to his task organisation. No 33 Wing RAF Regiment deployed from the United Kingdom to relieve No 3 Wing. The RAF Regiment units played a key role, with many acts of individual

The Cyprus Green Line, originally established by the RAF Regiment in 1964, is still there, now as the UN Buffer Zone.

gallantry, in dampening the internecine conflict, which was as bloody and unpleasant as any other.

The political situation in Cyprus stabilised, albeit with much residual tension, before flaring-up again with an attempted *coup d'état* in July 1974. Inter-communal violence raged and the RAF Regiment deployed to protect RAF installations from ground and air attack, whilst also rescuing British personnel and dependents trapped in domestic accommodation near the fighting. The violence was so intense that RAF Regiment units were deployed from the United Kingdom to assist with the evacuation of British nationals. The violence ultimately precipitated the Turkish invasion, to protect the Turkish Cypriot community.

The situation in Cyprus eventually stabilised into peace and there was to be no serious recurrence of violence. The RAF Regiment finally withdrew its last squadron in 1996, ending over 40 years of continuous involvement in the security of the island and the RAF installations based on it. Whilst the last few years of its involvement on Cyprus saw peace between the Greek and Turkish communities, the RAF Regiment remained busy to the end providing protection from Middle-Eastern terrorism. This was a serious threat to security, and was brought into clear focus by the 1984 mortar and missile attack against RAF Akrotiri by Libyan-sponsored terrorists from Lebanon.

1964 saw a number of mutinies by local forces in East Africa. As part of the United Kingdom's efforts to support its Government, No 38 Sqn RAF Regiment was deployed by air to Kenya. In the following year, a terrorist campaign began in Aden and there was a rapid escalation of incidents, so that by September 1965, there was a monthly average of one attack per day. The escalation continued into 1966 with huge increases in terrorist activity and industrial unrest. The location of RAF Khormaksar, close to Aden, and of considerable tactical and operational importance, made it especially vulnerable to attack. Nos 37, 48 and 51 Sqns RAF Regiment, in the field role played a crucial role in ensuring the security of air operations from the ever-present threat of terrorist attack. RAF Regiment gunners once again found themselves employed operating machine guns in the RAF's support helicopters, often when they were flying security patrols to protect the airfield. The terrorist threat grew through to final withdrawal the following year, when the situation was even worse.

RAF Khormaksar was key to every operation in Aden and, arguably the survival of British forces in the protectorate. The RAF Regiment squadrons were to prove their value time and again, and to the very end (an RAF Regiment officer was the last member of the RAF to leave Aden). The demands were enormous and reinforcement from the Royal Anglians was necessary in the latter stages, when the threat was at its most severe.

The illegal declaration of independence by Rhodesia necessitated support to Zambia, which desperately needed air defence. In a typically rapid response, Javelin fighters were deployed and an RAF Regiment squadron was also deployed from the United Kingdom to provide ground defence. At the eastern end of the Empire, flights from RAF Regiment squadrons based in Singapore deployed to Hong Kong in 1968 to help maintain security and confidence. The RAF Regiment continued to be involved in Hong Kong into the mid-1970s providing protection at both RAF Kai Tak and at the radar station at Tai Mo Shan. To add extra complications, in 1969 serious disorder began in Northern Ireland and started a long commitment for the RAF Regiment in a similar role. Although not part of the Empire, this commitment along with the demands of defence of Western Europe would shape the RAF Regiment's ability to play a role in other parts of the Withdrawal and contributed to operational overstretch that has characterised the majority of the RAF Regiment's existence.

However, the emergence of the 'Troubles' in Northern Ireland did not stop challenges emerging elsewhere. One of the consequences of the withdrawal from Aden was Yemeni-sponsored and supported insurgency in Oman, which soon became a rebellion against the pro-British Sultan. The rotation of RAF Regiment squadrons through Muharraq in Bahrain allowed for detachments to be deployed to Sharjah, Salalah and Masirah, so Oman was a well-understood country. Before long, the rebellion began to pose a severe and, for the time, sophisticated threat to RAF Salalah. Once again, air power was to prove critical to operations in Oman, a point that was not lost on the rebels.

The reduction in the Bahrain commitment allowed for the deployment of a full squadron to Salalah, where a series of fighting positions was built on the approaches to the airfield. These 'Hedgehogs' were heavily armed and bore many hallmarks of the

While defending Salalah in the 1970s, RAF Regiment personnel would often be deployed forward in 'hedgehogs'.

fighting positions seen in recent years in Helmand province in Afghanistan. Equipped with medium mortars, ground surveillance radar and heavy machine guns, and supported by the medium artillery of the Sultan's and the Jordanian Army's artillery, they were formidable defensive positions. The determination of the rebels was clear though, and many attacks were attempted against the airfield. The professionalism of the Regiment's actions in defence of Salalah was such that the new Sultan requested that RAF Regiment officers were loaned to his infantry, following the withdrawal from RAF Salalah in 1975.

An attempt at independence led to trouble in Anguilla in the Caribbean which required the deployment of a detachment to Coolidge airfield in Antigua, a commitment which lasted for two years. A little later, in the Mediterranean, there was a breakdown in the relationship between the British and Maltese governments. Once more, RAF Regiment units found themselves deploying rapidly as part of a larger task force. In this case, No 5 Wing RAF Regiment, with No 15 Sqn RAF Regiment under command, found themselves defending RAF Luqa until a treaty between the two Governments was signed.

The early 1970s also witnessed trouble on the Western shores of the Caribbean when Guatemala threatened the borders of British

Honduras. The deployment of No 48 Sqn with the Tigercat surface-to-air missile system caused an immediate furore as there were (wholly inappropriate) comparisons with the Cuban Missile Crisis. Bofors guns were deployed to replace the missiles and in 1977 the threat to Belize, as it had become known, significantly increased. Tigercat was once again deployed to protect Belize Airport, supplementing the Bofors guns. In 1978 both were replaced by Rapier surface-to-air missiles to provide a state-of-the-art short-range air defence system. This provided more capable defence to the airport, which was the base for a flight of Harriers and a flight of Puma helicopters, and which would have been a vital component of any emergency reinforcement plan. Belize achieved independence 1981, but Guatemala was not to recognise its sovereignty until 1991 and the United Kingdom maintained its forces there, including the RAF Regiment Rapier detachment, until 1994.

Throughout the period of the Withdrawal, the future of the RAF Regiment was frequently in doubt. The Sandys Defence Review of 1957 did grievous harm, but the Regiment survived and at each future challenge, it seemed to find itself heavily engaged in a number of concurrent emergencies somewhere in the Empire or the Commonwealth. Crucially, the senior leadership of the RAF recognised the importance of protecting the Service's aircraft, personnel and equipment, and it valued highly the Regiment's work. Staunch in defence of the RAF, the RAF Regiment found equally staunch defenders in those who had seen the benefits to British air power of its continued existence. Over the period of the Withdrawal, which had given the RAF Regiment a superb canvas on which to perfect the techniques of protecting air power against a range of threats, its successes came to the attention of the USAF. Faced with appalling losses of aircraft on the ground in Vietnam in the mid-1960s, it sought to understand better the RAF's approach to ground defence and security, and subsequently established its Combat Security Police. If imitation is the sincerest form of flattery, then this is a particularly flattering instance. Crucially, it served to confirm the rightness of the concepts which, if they had not been so sound, would undoubtedly have been rejected for another model. Along with this came a highly successful USAF-RAF Regiment exchange programme that continues to this day, and which sees a USAF Force Protection

concept that is increasingly analogous to that pioneered by the RAF Regiment.

As a postscript, it is worthy of note that the RAF Regiment, in the form of the Queen's Colour Squadron of the RAF, took part in what was arguably the final act of Empire. On the night of 30 June 1997, the squadron provided the RAF contingent in the Tri-Service Royal Guard of Honour that ceremonially marked the transfer of Hong Kong's sovereignty to the People's Republic of China. In the glare of the world's media, the squadron played its part in reminding all who were watching of continued national pride and martial excellence, and the professionalism of the RAF Regiment.

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THE RAF REGIMENT CONTRIBUTION TO THE RAF GERMANY HARRIER FORCE

Wg Cdr David Caddick

David Caddick joined the RAF Regiment in 1979 subsequently seeing service in Northern Ireland, with the Harrier Force in RAFG and as CO of the Queen's Colour Squadron. Staff appointments included posts in the MOD, the PJHQ and at HQ Strike Command. He retired in 2001 to work on management issues as a consultant and academic, but in 2007 he joined the RAuxAF and was OC 2622 Sqn 2007-11, including a stint in Afghanistan. He was appointed Deputy Inspector of the RAuxAF in 2013 and is also currently a lecturer at Inverness College, University of the Highlands and Islands.

In this setting of the RAF Museum and on the occasion of a meeting of the RAF Historical Society I would like to start this session with a little indulgence, if I may, as to the nature of history. I was present at the RAF Historical Society Seminar on the Royal Air Force Regiment that was held here on the 7th of November 1994, some 23 years ago, the proceedings of which were recorded in Journal number 15[1]. I recall talking with Marshal of the Royal Air Force Sir Michael Beetham, a great friend and advocate of the Regiment, and also a great friend and advocate of the Royal Auxiliary Air Force, so I am doubly grateful to him, and I remember saying how good it was to be able to hear from people who 'were actually there.' 'Yes,' he replied, 'it's living history – but it does make you feel old.' So, with those words of Sir Michael of 23 years ago still ringing in my ears, I stand before you to tell the story of one part of the RAF Regiment's history during the Cold War, and as I was there, 'I don't half feel old,' and that story is the RAF Regiment's contribution to the RAF Germany Harrier Force.

In telling this history I will first of all set the context of what the RAF Germany Harrier Force was and what made it unique. I will then look at how the RAF Regiment was organised to support the Harrier Force and then draw what are my own observations and deductions of the contribution that the Regiment made, but also look at what the

Regiment itself gained from that experience.

However, first of all I will set out my own stall and my connections with this period of history. I served at RAF Gütersloh from 1987 until 1989 as the Harrier Sites Officer, more on that role later, but I am also aware that in the audience there are a few old Harrier hands, well actually there is a former Harrier Force Commander, so no pressure there then, and as they were 'also there' I welcome their input and recollections. I would also point out that 'The RAF Harrier Story' has been covered in detail in an excellent publication by the RAF Historical Society[2], again based upon the experiences of those 'who were there' and I commend it to you.

It goes without saying that without the Harrier there would have been no Harrier force. The concept of an aircraft that could land and take off vertically and thus be freed from the constraints of large fixed runways began to be seriously researched during the 1950s. The concern was that large, fixed airfields and installations essential for the jet age could be easily targeted, attacked and destroyed and that dispersal could offer a form of force protection that would be difficult and costly to counter.[3] A lesson that both the Allies and the Axis Forces had learned repeatedly during the Second World War.[4]

During the 1960s the Hawker Siddeley P1127, later named the Kestrel, was developed using the concept of a vectored thrust jet engine whereby the nozzles of the engine could be turned in flight. This arrangement would enable vertical lift that could then be transitioned into forward, or indeed rearward, thrust.[5] After much testing and evaluation, the aircraft that was developed became the Harrier GR1, capable of conventional landing and take-off, short take off (STO), rolling vertical landing (RVL) where the aircraft lands vertically whilst maintaining a slow forward speed, rolling vertical take-off (RVTO) and off course the famous vertical take-off and landing (VTOL). The advantage that these capabilities gave the Harrier over conventional fast jet aircraft was staggering. For example, a conventional take off with a full fuel load for Harrier GR1 required a ground roll of 2,200 feet, whereas a STO with a full fuel load reduced the ground roll to just 750 feet.[6]

Of course, an exceptional aircraft required exceptional pilots and the demands of flying such an aircraft should not be underestimated. It is no surprise then that so many Harrier pilots gained the highest ranks

A GR3, the fully developed 'first generation' Harrier, of No 4 Sqn. (Wilfried Zetsche)

of the RAF. As an example, in my own rough and ready calculations, from the two years that I served at Gütersloh there emerged no less than one air chief marshal, one air marshal, three air vice-marshals and a handful of air commodores from the very small pool of two Harrier squadrons, about 50 pilots in all. I will return to this theme later.

The GR1 entered RAF service in 1969 with No 1(F) Sqn at RAF Wittering. The RAF Germany Harrier Force began to form in 1970 when No 4 Sqn received its first Harriers at RAF Wildenrath and by 1972 Nos 20 and 3 Sqns had followed, with the RAF Germany Harrier Force comprising 36 aircraft, with the capability of being reinforced in war with up to 12 further aircraft and crews from the Wittering-based OCU.[7] The GR1 was upgraded to GR3 standard in early 1975 with a more powerful engine and a consequent improvement in overall performance.[8]

In 1976 the Harrier Force was relocated to RAF Gütersloh due to the withdrawal of the Lightning force from Gütersloh and the assumption of air defence duties by the longer-range Phantom which could operate effectively out of RAF Wildenrath. Thus, the Harrier force was reorganised into two 18-aircraft squadrons, Nos 3 and 4, and No 20 Sqn's number plate was reallocated to a new Jaguar squadron at RAF Brüggen. Gütersloh was closer to the headquarters of 1 British Corps [1(BR) Corps] at Bielefeld and was also closer to the predicted war time operational area along the inner German border.[9] The Harrier Force was to continue to operate from Güterlsoh until the end of the

Extreme engineering – an engine change in the field. (‘21zebra’)

Cold War which, for the purposes of this paper, will be taken as the fall of the Berlin Wall in November 1989.

The concept of operations for the Harrier Force was quite simple, in that, during transition to war, the Force would disperse off-base to predetermined sites and operate from dispersed, austere locations exploiting its unique VSTOL capabilities. The role of the Force was to provide close air support for 1(BR) Corps in the battle for the central plains of Europe in the Third World War scenario that was envisaged by military planners in both NATO and the Warsaw Pact.[10] It is perhaps difficult for those who ‘were *not* there’ to understand the atmosphere of the Cold War. The feeling was very much not *if* the war would start, but *when*, and there was a constant rehearsal for that day. This preparation went into fine detail, right down to the Harrier Sites Officer having a collection of deutschmark and pfennig coins in his deployment bag so that he could call into Gütersloh via the West German civil telephone network to confirm that pre-determined war sites were still suitable for occupation. This was long before the days of mobile phones.

The dispersal of the Harrier Force required, in effect, the creation of a series of individual tactical airfields that could support, usually

six, aircraft, but sometimes more, and enable them to fly from and recover to those sites. Thus, they required physical infrastructure, logistics, engineering, command and control and, of course, force protection. In addition, there were all the functions that any operational airfield might require such as air traffic control, crash and rescue, meteorology, intelligence and reconnaissance including the ability to process and interpret wet film imagery, provost and security, catering, medical and indeed even chaplaincy services.[11]

Physical infrastructure was provided by the Royal Engineers with 38 Engineer Regiment based in the UK designated as the Harrier Support Regiment, but with one of its Field Squadrons, No 10, being permanently based in Gütersloh, and communications infrastructure was provided by the Royal Signals with 21 Signal Regiment supporting the RAF Harrier Force. Logistics support, including the provision of fuel and weapons, was provided by the RAF Supply Wing at Gütersloh, whilst engineering support was provided organically by the respective Harrier squadrons, and force protection (FP) was co-ordinated by an RAF Regiment Wing Headquarters with up to two field or light armoured squadrons under command. [12]

A typical deployment of the Harrier Force consisted of: a total of six flying sites, three per squadron, each commanded by either the Squadron Commander or one of the Flight Commanders; two logistics parks commanded by a logistics squadron leader; and a Forward Wing Operating Centre or FWOC, whence the Harrier Force Commander controlled the Force, along with his with Operations, Intelligence, Logistics and FP specialists. Thus, there were a total of nine sites required for a deployed Harrier Force, plus any step-up sites that were identified and being prepared to enable movement of any of the sites should they become untenable for any reason. It was not therefore untypical for a major Harrier Exercise to utilise as many as fourteen or fifteen sites during a two-week exercise to practice the deployment and movement of the Force under simulated war conditions.

The exercising of the Force took place in and around the military training areas of Sennelager, some 25 miles from Gütersloh, Bergen-Hohne to the north and across requisitioned areas of farmlands and woods, small airfields and minor military training areas around the Gütersloh/Osnabruck/Bielefeld area, under the Status of Forces Agreement that permitted troop exercises in Germany. Exercises

Deployed operations required the laying of metal planking courtesy of the Royal Engineers. (‘21zebra’)

normally lasted either one or two weeks but with Royal Engineer and Royal Signals preparation and recovery taking anything up to two weeks either side of the main event. The Royal Engineers constructed the aluminium planking take off strips, landing pads and taxiways that enabled the Harriers to operate on field sites, whilst tank roads and pre-laid concrete strips in training areas were also utilised in order to simulate the war sites that the Force would use. A typical Harrier deployment might involve the road movement of 1,000 vehicles of all types and indeed rail movement was also used for vehicles to the further locations of Bergen-Hohne and bulk fuel was even moved by barge on one exercise.

Exercises took place normally three times a year with such names as HANDY FORGE, HARD FROST, HILL FOIL and HAZEL FLUTE, the final exercise in September usually culminating in the Harrier Force undergoing its NATO tactical evaluation or TACEVAL. This was when a whole host of NATO evaluators descended upon the Force, to check and test its capabilities. The first took place in 1973 and was a useful tool in identifying issues and enabling improvements to be made, although I am sure it did not seem so at the time.

The war locations for the Harrier Force were pre-recced and classified top secret. They were identified by a small team from map reconnaissance and then confirmed by a clandestine site visit. They ideally used existing roads for take-off and existing buildings for dispersal and concealment. Typically, 'light industrial sites' of which there were many in Germany at the time, proved a very fruitful source of potential war sites. De-conflicting with other military users was not an issue as the Harrier force enjoyed almost exclusively 'first call' on real estate in the 1 BR Corps area. Of particular note was the need to ensure that the Bundeswehr demolitions controller was aware of our needs, as there was an extensive plan of German army demolitions against roads and infrastructure to slow down any Soviet advance, and like all demolition experts they were very keen for any excuse to blow things up.

Surveying the potential sites could prove tricky as we wanted to measure distances, check climb out angles and get a feel for the weight-bearing capabilities of surfaces. This was difficult to do when dressed in civilian clothes and trying not to draw attention to ourselves. This was overcome by one enterprising sergeant from the Royal Engineers who suggested that the Germans love nothing better than an official form and an order. So we got the station interpreter to write a letter for us, in her best high German, explaining that we were British military personnel undertaking our civil engineering qualifications and we *were* to be offered all possible assistance. This was then covered in several red ink stamps. When we were confronted by anyone we simply produced this letter. The effect was magical and we certainly got to see far more than we ever would have done otherwise and were once entertained to coffee and given a detailed tour of a grocery warehouse as a result.

The RAF Regiment contribution to the Harrier Force took several forms. The first was the direct support to the Force by RAF Regiment Wing HQs and squadrons. Initially with the introduction of the Harrier to service No 5 Wing Headquarters with Nos 15 and 51 Sqns under command were re-deployed to RAF Wittering as the Harrier Support Wing in 1970. No 33 Wing HQ took over this role in 1973 and redeployed from Catterick to Wildenrath. It moved again, in 1976 to Laarbruch, and finally to Gütersloh in 1980.[13]

The Wing HQ was responsible for the coordination of the field

An RAF Regiment Scorpion at a remote Harrier site.

squadron contribution to the Harrier Force. After 1973 in Germany this was provided by No 1 Sqn based at RAF Laarbruch with reinforcement from No II Sqn or another UK based field squadron, depending upon other operational tasking at the time. Initially equipped with soft-skinned Land Rovers and fire support from the squadron's organic 81mm mortar flight, in 1983 the RAF Regiment field squadrons had re-equipped with the Alvis-made Combat Vehicle Reconnaissance Tracked (CVR(T)). Fire support was provided by the Scorpion Armoured Fighting Vehicle, with a 76mm gun capable of firing a variety of ammunition types, and protected mobility provided by the Spartan personnel carrier.[14]

Thus the field squadrons were equipped for a range of duties in support of the Harrier force including: route reconnaissance; convoy protection; site clearance; forward reconnaissance and screening; finding, fixing and striking the enemy; and nuclear, biological and chemical (NBC) reconnaissance, warning and reporting. Elements of the field and light armoured squadrons could be deployed as required to the various sites depending upon the threat. The ability of the squadrons to break down into independent flight-sized fighting groups

Force Protection (FP) – an RAF Regiment gunner with a GPMG.

served the Harrier deployment concept well.

The second contribution to the RAF Germany Harrier force came from the Wing HQs themselves. Outside of the RAF Regiment Squadron deployments the Wing HQ acted as a source of expertise in FP matters readily available to the Harrier Force Commander, and being co-located with the Harrier Force meant that FP measures could be integrated in all aspects of Harrier Force planning. The Wing HQ also provided four Field Operation Officers (FOOS) who, whilst being part of the Wing HQ, provided the deployed FP headquarters for four of the deployed Harrier Flying Sites. They were responsible for all FP aspects of the operation of the flying site, including the collective training of personnel and advising the Site Commander on FP measures, and fighting the FP battle. The FP commanders of the remaining two flying sites were provided by the RAF Regiment officers attached to the flying squadron.

Here lies the third contribution of the RAF Regiment – the provision of embedded RAF Regiment personnel, a flight lieutenant and a senior NCO being formally established within each of the Harrier squadrons, and they provided enhanced ground defence

training (GDT) and deployment skills, such as living in the field, convoy procedures, field defence construction and NBC warning, reporting and decontamination techniques. They also provided expert FP advice and guidance to the squadron personnel at all levels. By embedding these personnel in the squadron establishment, a mutual understanding and confidence was engendered and FP measures really did become second nature on the Harrier squadrons.

A fourth contribution was the establishment of a flight lieutenant RAF Regiment post in the Harrier Plans organisation that was responsible for the planning of peacetime exercises and war deployment sites. Commanded by a senior Harrier pilot of squadron leader rank, the rest of the team consisted of a flight lieutenant supplier and a flight lieutenant RAF Regiment officer, together with an attached Royal Signals captain, a Royal Engineer junior officer and a Royal Engineer senior NCO. The role of the team was wide ranging from liaison with HQ 1(BR) Corps at one extreme, to dealing with complaints from irate German farmers at the other. That could have its funny moments. I recall going to visit a German farmer who had lodged a compensation claim stating that a Harrier had been in the hover over his barn during an exercise the previous year and, as a result, it now needed a complete new roof. I asked him to confirm the dates, which he did, and I asked him if he was absolutely sure, which he was. I then very politely pointed out that we were not on exercise in his area last year and, indeed, that we were not on a deployed exercise anywhere in Germany on those dates. Somewhat crestfallen, he asked me if we would be back again soon as he really needed a new roof and, if not, could I arrange for a Harrier to come and hover over it please?

So how can we quantify the overall contribution by the RAF Regiment to the RAF Germany Harrier Force? Well, first, I think it is safe to claim that the Regiment initially brought a lot of hard deployment experience to the Harrier Force and was able to guide and help it through the not inconsiderable difficulties of deploying not just one, but six, small tactical airfields, with all their supporting elements, into an austere location. I say initially, because, before long, many in the Harrier Force were as good as the RAF Regiment at deployed operations, albeit in a very specific area or role. The deployed operating experience that many of the RAF tradesmen and women

developed in the Harrier Force was evident to any observer and certainly reflected in the high TACEVAL scores that the Harrier Force consistently achieved. Without the input of the RAF Regiment I doubt that this would have been achieved so well or so quickly. However, I think we may all be guilty of a tiny little bit of vanity here and that brings me back to my opening remarks about the nature of history. Whilst we all congratulate ourselves on the ability to deploy and operate fast jets from the field, I wonder how our efforts would have been judged by the men of the Desert Air Force, or South East Asia Command, or the Allied Tactical Air Forces in Europe or by the Airfield Construction Squadrons or the RAF Servicing Commandos? Perhaps if we had learned from their living history we might have been better, faster.

Secondly, I think it is also safe to say that the RAF Regiment provided the Harrier Force with a truly air-minded Force Protection Force, that understood the nature and importance of air operations in general, and the unique and special contribution that the Harrier Force made to the Cold War in particular. In numbers of aircraft it was not a massive contribution, and as other fast jet pilots were always fond of saying 'it doesn't fly very far or very fast',[15] but in terms of support to the British ground forces and its ability to survive through dispersal, its contribution to the headaches of our opposite numbers in the Warsaw Pact was unrivalled. The protection of that Force, in its totality, was perhaps best left those who understood it best.

Thirdly, the RAF Regiment contribution came in the form of being 'naturally joint' before jointery became fashionable again. With one foot in the air campaign and one foot in the ground campaign, the RAF Regiment's personnel were able to bridge the doctrine, tactics and training gap that so often divided the Army and RAF during the Cold War. They were able to see and explain both perspectives to whoever would listen, and that could only be a good thing.

Finally, the RAF Regiment was instrumental in embedding Force Protection into the Harrier Force and to providing that 'military essence' that was a vital ingredient to its success, through both structure, as explained previously, but also through relationships and personalities. When you hear two Harrier pilots debating how far grenade-throwing range is, because that's how far the Dannert wire obstacle should be positioned, then you know your colleagues have

made a real impact.

But before I close this session, I would like to reflect on the contribution that the RAF Germany Harrier Force made to the RAF Regiment, for it would be somewhat hubristic to consider that the traffic was all one way.

First, quite simply, the Harrier Force provided a justification for the retention of a Wing Headquarters and two field or light armoured squadrons during the Cold War, and that, in turn, added to the critical mass of the RAF Regiment. With that critical mass, it was easier to argue for equipment, for manpower, for training and for a whole range of other things within the fierce debates on defence spending that went on during the Cold War. It also added to the *raison d'être* for the RAF retaining its own Force Protection Force, something that we have been advocating, and I am pleased to say been successful in maintaining, for the past 75 years.

Secondly, the Harrier Force was a way through which the RAF Regiment could interact with the larger RAF and the larger RAF could get to know the RAF Regiment. Quite simply, it broke both parties out of their silos and they got to understand and, I think, respect each other for their professionalism. Linked to my example of the grenade-throwing range conversation, when your Boss asks you, as a Regiment officer, to draft the air traffic plans for a Harrier exercise, you know that you are truly becoming air-minded!

Finally, and following on from the above, certainly at the officer level, it exposed the RAF Regiment to some very sharp-minded individuals and here I speak from personal experience. The calibre and quality of the Harrier Force officers was immense and, as I pointed out earlier, this is certainly reflected in their subsequent service careers. Working in that sort of environment cannot help but rub off on you and I think that any member of the RAF Regiment who worked in the RAF Germany Harrier Force was a better professional for it.

So, to conclude, the RAF Germany Harrier Force was unique. It was a unique aircraft, flown by some unique people (and I use that description in every sense of the word) with a unique tactical doctrine in a unique time. The RAF Regiment contribution to it was considerable, and on many levels and in many forms. However, the contribution was not all one way and the relationship is perhaps best described as symbiotic, benefitting each party equally, but differently.

However, I think that, for me, the true reflection of that relationship is in how I still think of the RAF Germany Harrier Force. It was not this squadron or that squadron, or this wing or that regiment, it was all of us together in a common endeavour, practising for what we hoped would never happen, but in earnest in case it ever did.

And, finally, I would make a plea for living history. If we ever decide to operate fast jets from the field again, please read these proceedings; please read the *The RAF Harrier Story*[16] and please read the accounts of our forebears in the tactical air forces of the Second Word War and, indeed, the writings of such people as Slessor[17] and Lawrence[18] and their experiences in the Middle East during the First World War. Let history be your guide.

Notes:

1 *RAF Historical Society Journal 15*, 1996.
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4 Gray, Peter W (Ed); *Air Power 21, Challenges for the New Century* (HMSO, London, 2000) p177-179.
5 Scrimgeour, Air Cdre D M in *The RAF Harrier Story* (RAF Historical Society, 2006) pp39-47.
6 *Ibid*, p42.
7 Heron, Gp Capt Jock in *The RAF Harrier Story* (RAF Historical Society, 2006) pp55-63.
8 *Ibid*, p57.
9 PAM(Air) 426; *A Short History of the Royal Air Force* (MOD, 1994) p100.
10 Hackett, General Sir John; *The Third World War, The Untold Story* (Sidgwick and Jackson, London, 1982) p70.
11 Lewis, G J; *Flugplatz Gütersloh* **(**Privately published, Gütersloh, 1987) p140.
12 Heron, *op cit*, pp55-63.
13 Oliver, Kingsley M; *Through Adversity* (RAF Regiment Fund, 1997) p243.
14 *Ibid*, p250.
15 Marston, Robert; *The Harrier Boys, Vol 1* (Grub Street, London, 2015)
16 *The RAF Harrier Story* (RAF Historical Society, 2006).
17 Slessor, John; *The Central Blue: Recollections and Reflections* (Cassell, London, 1956).
18 Lawrence, T E; *The Seven Pillars of Wisdom* (Guild Publishing, London, 1988) Chap CXII.

MORNING DISCUSSION

Air Chf Mshl Sir Richard Johns. While the speakers are joining me on stage to answer questions, I will take this opportunity to add something to what David Caddick has been telling you. He has focused, quite rightly, on the Harrier Force based at RAF Gütersloh but on that station we also had RAF Germany's Support Helicopter (SH) Force – a squadron of Pumas and another of Chinooks – and they too deployed into the field and benefited equally from the force protection expertise offered by the RAF Regiment. While David was very complimentary about the calibre of the officers associated with the Harrier Force, I ought to make the point that this was equally true of the SH Force. Indeed, the most recent CAS, Air Chf Mshl Sir Andrew Pulford, served under my command at Gütersloh when he was a junior officer with No 18 Sqn, and if you examine the careers of the people who flew with him at that time you will find that they too produced a wave of officers who rose to very senior ranks within the Service. So what was the common factor? In short – off-base deployed operations – and as that concept evolved it became clear that it demanded exemplary leadership and solutions to complex questions relating to, for instance, command and control that were unique within the RAF and I believe that it was the ability to make the system work, and to solve the many problems that it involved, that led to so many of the officers who served in the Harrier and SH Forces in the later stages of the Cold War attaining senior ranks. I thought that that was worth saying, as a balancing contribution, to offset the possibility that anyone might have been left with the impression that all Gods were born within the Harrier Force. (*Laughter*) And so – questions.

Mike Meech. I was an airframe fitter on No 72 Sqn – SH helicopters based in the UK. We too had RAF Regiment embedded with us and they were cross-trained as, for example, bowser drivers. How did the Regiment feel about that?

David Caddick. From my personal experience, I think that it is true to say that an attachment to a helicopter squadron was seen as a pleasant break from the routine rigours of life on a Cold War Regiment squadron! To provide some context, apart from the recurrent demands associated with TACEVAL, the four Rapier

squadrons based in Germany were responsible for maintaining the Falklands roulement; the two UK-based Rapier squadrons covered the Belize roulement while the four UK-based field squadrons were responsible for the Northern Ireland commitment and No 34 Sqn in Cyprus was committed to local internal security issues. In short all of these were full-time, and often pretty rugged, obligations. Life attached to an SH squadron could also be demanding, sometimes even frantic, especially during field exercises, but these were of relatively short duration and generally predictable, so you could actually organise your life – and you picked up some really useful qualifications – like being a bowser driver . . .

Dr Nigel Warwick. It is interesting to observe that, prior to and indeed when the Regiment was first formed, what happened in Burma and North Africa was that the gunners, in particular, were often misused. They tended to be seen as an available pool of manpower who normally just sat around in trenches manning Lewis guns and who could, therefore, be given more important things to do – at the expense of their primary function, of course. The worst examples were probably in the North African campaign where some ground gunners spent their time as attendants in the pilots mess – a 'more important' task? This was jumped on pretty quickly once a Regiment command structure was created. This was, perhaps, the beginning of a discernible trend in that Regiment personnel could be misemployed on occasion. In Borneo in the 1960s, for example, gunners attached to helicopter squadrons operating into and out of forward landing grounds could become involved in loading and unloading freight while flying as air gunners. These tasks can be seen as an appropriate extension of the Regiment gunner's role. A degree of flexibility in the employment of manpower is obviously an asset, but one does need to be careful not to cross a line – it is all too easy for gunners to become regarded as general duties hands.

Johns. I think it's worth adding, to what David said, that the Regiment had a significant training commitment where deployed Harriers and helicopters were concerned because all of the men involved – and it was only men in those days – carried their personal weapons with them at all times when in the field – SLRs for NCOs and airmen, pistols or sub-machine guns for officers. That was a

personal responsibility, of course, but it imposed a significant training load on the RAF Regiment while we were back at base to ensure that all personnel were familiar with their weapons so that we wouldn't go around inadvertently shooting each other.

Gerry Pye. I was in Crete a few year ago and, close to Maleme airfield, I came across a memorial to RAF personnel who had died there while serving with two RAF squadrons in 1941. The names on RAF memorials are generally those of officers and NCOs who died as aircrew, but these were unusual in that most were junior aircraftmen who had been caught up in a ground action. Some reference has already been made to this, but could you expand on the significance of the loss of Crete in the establishment of the RAF Regiment.

Warwick. Coincidentally, I was standing by that same memorial myself about a year ago. The reason that there are so many airmen of Nos 30 and 33 Sqns commemorated on that stone was, basically, a lack of co-ordination between the Brigade Commander and the RAF over the siting of defensive positions around the airfield – and the RAF had actually established its encampment outside the perimeter. As a result, when the German paratroopers attacked from their bridgehead on the Tavronitis River, their firing towards the airfield went through the RAF camp. That said, most of the airmen who became casualties were groundcrew actually manning defensive positions, from which they fought gallantly, although many would have received only basic weapons training.

The fall of Crete did have a bearing on the creation of the RAF Regiment. The fact is that, although the fighting went on for several days, the battle was lost in the first few hours because the only thing that the Germans had to do was capture an airfield. The problem was the Brigade Commander, a New Zealander, who simply failed to appreciate the crucial significance of the airfield. He had learned his trade in the First World War, of course, as had many of the British and Commonwealth land commanders at that time, and his approach was to occupy high ground and defend it. He soon began to lose contact with his troops and when they began to withdraw, he effectively ceded control of the airfield, permitting the Germans to fly-in reinforcements.

There's an interesting question here, indeed one that was actually

given to the JROC[1] last year as their essay topic – 'What difference would it have made if there had been an RAF Regiment?' There are two aspects to the answer. First, assuming that the resources had been available, there would have been a far more comprehensive light anti-aircraft defence – as it was there were just two Bofors guns – but at that stage of the war the reality was that there simply weren't enough Bofors guns to go around, so it probably wouldn't actually have made much difference. The more important point to emphasise, however, is that if there had been an RAF Regiment officer available to advise on force protection, and with enough rank to impress the Force Commander, the airfield would have been far more effectively defended under the direction of someone who understood just how important it was to retain possession and the significance of its various facilities and their relative vulnerability. That might have made a real difference.

Gp Capt Rich Langley. I would just add, to underline what Nigel has already said, that Crete, and Maleme in particular, is regarded as being of central importance within the Regiment to the extent that the JROC[1] goes out to Crete every year to study the battlefield, under Nigel's direction. Thus they learn both the strategic and tactical lessons taught by that battle. We consider Crete to have been of paramount importance to us.

Caddick. Reflecting on the lessons learned, it is interesting to note that when the Germans made their first attempt at an air-landing with the aim of establishing whether the airfield was defended, the crew's orders were to take off again if they came under fire, and no more would have followed. They were not shot at, so additional aeroplanes began to fly in. If one man with a Bren gun had emptied a magazine into the cockpit of that first Ju 52, the outcome of the whole campaign just might have been quite different.

Johns. James – as the most recent graduate of the JROC,[1] have you anything to add?

Flt Lt James Lockhart. Only to say that I did have the pleasure of going to Crete and it was very nice break . . . (*Laughter*). More seriously, I think that some army commanders, not all of them, of course, tend not see beyond the next hedgerow and, even today, their

perception of the RAF is of a support arm, providing a taxi service via helicopter and a means of getting them out of trouble via CAS when they get stuck. But the RAF Regiment has a very focused mission – airfield defence, and had there been someone at Maleme, even before the existence of the Regiment, with specific responsibility for airfield defence it might well have been possible to prevent the Germans from landing and permitted the RAF to use the aerodrome to defend the island.

Wg Cdr Jeff Jefford. There was no mention of air defence in the context of the Harrier. Is that because the sites were supposed to be covert, or because it was too difficult to set up safe lanes for a complex of dispersed sites – or were there just not enough Rapiers to go around?

Johns. We had Rapiers at Güterlsoh, No 63 Sqn, which went down to the Falklands in 1982. Interestingly, they left their fire units behind and picked up new ones as they passed through the UK. That said, all of the RAF's four main bases in Germany had its own SHORAD capability. My personal view is that there was no overriding need for 63 Squadron to deploy into the field with the Harriers. I did, I think, twenty-one field deployments during my time in Germany and I can recall only one occasion when we took Rapiers. That aside, we have to remember the strategic importance of Gütersloh which represented the airhead for 1(BR) Corps. I can't recall the exact numbers of troops who were going to arrive but it was a whole division that was to redeploy from the UK to Germany at the appropriate stage during Transition to War (TTW). Clearly, in order for the Army to receive its reinforcements, it was critical that Gütersloh be provided with an air defence capability – so that was where its Rapiers would do most good. From a parochial Harrier perspective, we also had a vested interest in Gütersloh remaining open because that was the way-in for 38 Engineer Regiment and we needed them.

If I may be permitted to digress for a moment, I think it's worth enlarging on this. When I was the Harrier Force Commander, I got to know General Sir Nigel Bagnall, the Corps Commander just up the road at Bielefeld. Shortly after I was in post he asked me to go and see him to discuss a variety of operational issues – but, in short, to explain exactly what the Harriers could do for him, once they were deployed,

in the context of the developing concept of manoeuvre warfare instead of linear defence. I told him that one of my major concerns was the scarcity of sapper support in Germany. We did have 10 Field Squadron which had a number of tasks to perform, like taking down roadside telegraph poles, preparing access to factories and so on. These were not particularly demanding but they all needed to be done very quickly and a single field squadron was simply limited in its capacity. General Bagnall got the message and another independent field squadron up at Munster was promptly reassigned to Harrier support pending the arrival in-theatre of 38 Regiment. So, to loop back to the beginning, that is why it was so important that Gütersloh be provided with SHORAD while protection of the Harriers relied on dispersal and concealment. We have some other ex-Harrier operators in the audience, Jock, you were OC Ops at Gütersloh – do you have any thoughts on that?

Gp Capt Jock Heron. Yes Sir, I do. You may recall major NATO exercises like CRUSADER in 1980, or perhaps LIONHEART in 1984, that involved numbers of big aeroplanes like British Airways 747s and American DC-10s arriving at Gütersloh with reinforcements so, I quite agree, that that was where the Rapiers were needed. We also required permanent on-base sapper support after the Harriers had deployed, because we needed a rapid runway repair capability in order to keep the airfield open. I have to say that I always had grave doubts about that, because the task was to repair two craters per hour and when you consider what the Soviets were capable of I think that they might well have beaten the system.

While I have the floor, perhaps I could say something about the Rapier, which hasn't received much attention thus far today.[2] When I commanded Port Stanley there were six batteries of RAF Regiment Rapiers deployed down there. Those people had a bond that impressed me enormously, not least because they spent three months on a remote field site, well away from Stanley, living in pretty primitive conditions. It was their spirit that carried the Regiment through in those days and I am sure that that is still the case today.

Wg Cdr Martin Hooker. As an ex-2IC of No 63 Sqn, I would offer the thought that, in order to provide adequate coverage of a deployed Harrier force, the real estate required by the Rapiers would have been

huge and we simply lacked the resources to handle that. Furthermore, it wouldn't have required a particularly astute Soviet intelligence officer to conclude that if we were deploying a sophisticated air defence system, we were clearly trying to protect a valuable asset. So, from both a security and a logistics point of view, it was a non-starter.

Caddick. Perhaps I could add something to what has already been said, my concern in the context of ground-based air defence – GBAD – was not the lack of it but the fact that there was probably already too much. The whole area was awash with missile systems, some of them manned by Belgian and German conscripts. The problem was not lack of coverage but how to control it all while ensuring that friendly aircraft could still get in and out safely – and that problem was compounded in the case of deployed Harriers by the secrecy surrounding the locations of their wartime sites.

Notes:

[1] Strictly-speaking, the Junior Regiment Officers Course – the JROC – but, in conversation, as here, usually rendered as the 'Jay Rock Course'.

[2] Papers on the RAF Regiment's Rapier and Tigercat were presented at the Society's 'Guided Weapons' seminar held in April 2015. See *RAF Historical Society Journal 61*, pages 79-95.

AIR DEFENCE IN THE RAF REGIMENT

Wg Cdr Lee Taylor

Lee Taylor was commissioned into the RAF Regiment in 1991 since when he has completed tours on Rapier and field (para) squadrons, including command of No 15 Sqn and the Defence CBRN Centre at Winterbourne Gunner, and filled posts with the staffs at HQ 2 Gp (three times) and the PJHQ, seeing service in Bosnia, Albania, the Falklands, Sierra Leone, Saudi Arabia and Afghanistan. He is currently the sole military representative in Defence Resources in the Ministry of Defence.

The issue of air defence challenged the RAF well before the inception of the RAF Regiment. Indeed, alongside aircraft as attack platforms, the need for control of the air was one of two doctrinal concepts that emerged from the First World War and led to early air power theory. The challenges of resource scarcity, manpower availability, caps and cuts, as well as inter-Service rivalries are not modern phenomena and can be traced throughout the RAF's history; lessons would eventually be learned the hard way. My aim in this paper is to show how the RAF Regiment built upon a difficult start in the air defence specialisation to truly protect air power, wherever it was deployed, and led the way in the development of this role. What I also hope to do is draw out some common and consistent challenges and themes over the years (from the Road to World War Two, through the Cold War and into the 21st Century) – many of which might seem familiar today. This paper draws heavily on the works of Kingsley Oliver that have charted the RAF Regiment's history over the years and are heartily recommended for their in-depth analysis.[1]

The Road to War – RAF Anti-Aircraft Defence

I think that, in order to understand what the RAF Regiment did in the air defence arena, it is important and necessary to understand the difficulties that the junior Service had in the 1930s recognising, and then mitigating, the emerging threat to its operating air bases.

In 1932 the 'no war for 10years' approach was formally abandoned by the government, and investment in the British armed forces

·303″ Lewis Quad Mount.

commenced – albeit slowly initially. The Air Ministry established the 'Committee on the Defence of RAF Stations against Air Attack' in 1935, which was chaired by Group Captain R H Peck. He was tasked with challenging the then existing Air Staff policy that the probable risk and scale of air attack on RAF stations did not justify the expense required to defend them. Peck recommended that all RAF stations south of the Tees should have anti-aircraft (AA) defence, but by 1938 it became clear that active air defence measures were required, although it was a case of what was available, rather than what was desirable.

Trials in the United States had identified the limited effectiveness of ·303″ calibre machine guns, and that ·50″ in a quadruple mount was the preferred air defence weapon. However, funding was tight and when the Army took delivery of 40mm Bofors guns, the costs increased significantly to make any broader purchases unaffordable – particularly for the RAF. This early inter-Service rivalry resulted in the World War One-vintage ·303″ calibre Lewis Light Machine Gun being chosen, despite its obvious obsolescence and serviceability issues, and established at 4 to 8 gun sites per airfield. The new

commitment – without dedicated additional manpower – was not universally greeted by the chain of command, which saw it as ‘an unwelcome diversion’.

Agreement was reached for the Army to retain responsibility for area defence and a commitment to provide AA guns to airfields. The RAF became responsible for the low-level attacks against airfields, and established anti-aircraft machine guns manned by aircraftmen trained as ground gunners. These dedicated air defenders were the forebears of the RAF Regiment.

It is interesting to note that at the start of World War II, whilst the RAF struggled to recognize a fundamental weakness and resource its solution, by contrast the *Luftwaffe* had 1·5 million men under arms, two thirds of whom were anti-aircraft, airborne or parachute troops.

Lessons Identified: the British Expeditionary Force (BEF)

In September 1939, ten squadrons of the Advanced Air Striking Force went to France with the BEF with 100 Lewis guns for AA defence. Following the German invasion, perhaps predictably, French AA defences were rapidly withdrawn in order to support their own air bases and, since the Army was unable to provide additional AA guns, more Lewis guns and ground gunners to man them were flown out from the UK.

The *ad hoc* nature of this defence and the lack of structured Command and Control (C2) arrangements resulted in disastrous losses of aircraft on the ground once the Germans attacked – the vulnerability of aircraft on the ground (as espoused by Douhet eighteen years earlier) was graphically (and catastrophically) demonstrated. We perhaps should not be surprised, as a lack of appropriate C2 is an enduring theme throughout history that has caused vulnerabilities. The AOCinC British Forces France summarised the lessons identified as:

- Insufficient AA weapons for airfield defence.
- A lack of personal weapons resulting in inadequate defence against ground attack.
- Unawareness of the importance of camouflage and dispersal.
- The need for mobile reserves (including armoured vehicles) to reinforce ground defences.

- The shortfall in Army units assigned to defend RAF airfields.

His report recommended a specially trained and equipped airfield defence battalion to prevent repetition of the disaster experienced in France. What was clear was that the RAF could not rely on the Army for close defence of RAF installations; the reality of conflict and resource constraints highlighted the concept as a fantasy.

Lessons Finally Learned: Crete 1941

Following the fall of Greece, 25,000 Allied troops were evacuated to Crete. On 20 May 1940, German airborne attacks established a toehold at Maleme Airfield, a fighter base. Following a rapid reinforcement and build up, German Forces completed the capture of Crete within ten days. The rapid capitulation of Allied defences demonstrated that an airborne army could, with overwhelming air support, overcome an opposing army and navy which had no air defence cover. Lessons had been identified in France, but had not been learned or absorbed by the time of Crete. This second loss did, however, lead to an urgent review and actions to be undertaken.

The Chiefs of Staff set up the Findlater-Stewart Committee on 31 May (the day after the fall of Crete), and by 21 November it had recommended the formation of an RAF Aerodrome Defence Corps under the Air Ministry. Notably, the War Office concurred with the proposal and, while stating that the Army did not wish to form such an organisation, offered every assistance to the Air Ministry in raising this force! On 1 February 1942, the RAF Regiment was formed and included at that point 300 independent AA flights.

Operations in North Africa, the Middle East and NW Europe

North Africa. In 1942 Army and RAF staffs began to examine the division of responsibility between the two Services for low-level air defence of RAF units in North Africa, where it was increasingly difficult to provide adequate defence for forward fighter wings in the desert. At this point, there were 57 independent light AA (LAA) flights in the Desert Air Force, but they still belonged to individual flying squadrons (subordinated to Group HQs). This led to issues of C2 when squadrons from different groups occupied the same airfield. Following a demand for manpower to be transferred to the Army, the AA flights were re-organised into RAF Regiment LAA squadrons and

RAF Regiment gunners serving a 40 mm Bofors at Caen/Carpiquet in July 1944.

de-linked from the flying squadrons. However, lessons were quickly learned and the links formed between the RAF Regiment and flying units in the Desert Air Force endured in subsequent operations throughout the Mediterranean theatre and contributed in no small way to the resounding success of tactical air operations wherever this integrated concept was followed.

Europe. On D-Day+1, three RAF Regiment LAA squadrons landed on Juno Beach, delayed from landing on D-Day by congestion on the landing beach. By the end of August 1944, 18 LAA squadrons were in theatre. As the Allies advanced, the air threat started to reduce, but it had not been entirely defeated, and two notable events highlighted the pervasive risk: on 28 November, No 2875 LAA Squadron RAF Regiment became the first unit to destroy a German jet fighter (Me 262 hit by a 40mm gun at Helmond in Holland), and on New Year's Day 1945, an all-out *Luftwaffe* attack by 750 aircraft targeted allied airfields. Defending eleven RAF bases, RAF Regiment LAA squadrons shot down 43 enemy aircraft out of 129 destroyed by anti-aircraft fire within the SHAEF area.

UK. Hitler's terror weapons, including the V1, were launched from

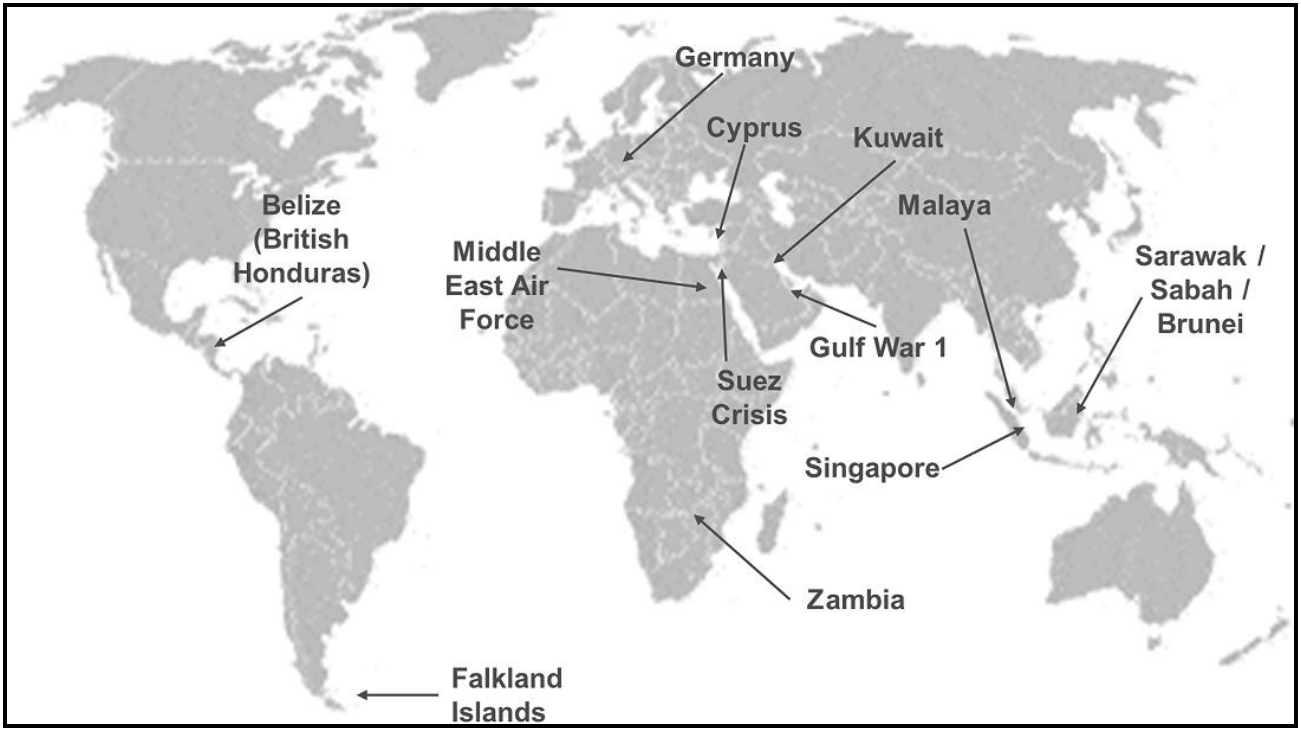
June 1944, causing AA units to be retained in the UK under Operation DIVER, which set up a belt of searchlights and guns from Folkestone to Beachy Head. The RAF Regiment's contribution was significant (52 LAA squadrons and more than 600 guns). As the Allies pushed German forces further north, then east, the threat diminished and DIVER ceased in October 1944.

The Cold War and Flashpoints

The LAA ORBAT in Europe on VE Day included 28 LAA squadrons and in the Far East there were another twelve on VJ Day. However, there were early signs of, now familiar, challenges and easily-given assurances. As early as March 1945 the War Office wrote to the Air Ministry to make it clear that the defence of airfields whether in the UK or abroad was a matter in which the Army reserved its right to influence post-war policy. The Air Council tasked the Inspector General of the RAF, Air Chf Mshl Sir Arthur Barrett to study the requirement for the RAF Regiment. His December 1945 report laid the foundations of the concept of an independent air force, recommending that the retention of the RAF Regiment was essential if a balanced force was to be maintained in the post war era.

Regrettably however, by 1950, the recent lessons from the war seemed to have been forgotten, as the Chiefs of Staff had agreed that the Army should be responsible for the LAA defence of airfields and ancillary units at home and overseas, with the exception that the RAF should provide this defence at certain locations outside the Army LAA area defence layout. CAS's rebuttal was forceful and highlighted that among the many advantages of the RAF providing its own LAA defence was that of economy, in that the RAF Regiment units represented a lesser cost to Defence than the Army units. The RAF won the day, although, as shall be seen, this logic failed to convince some 50 years later. Of note, throughout the challenges of Service and Corps manpower and force structure reviews through the years, within the RAF Regiment the proportion of LAA squadrons to field squadrons remained broadly equal.

The RAF Regiment maintained a continuous contingent and operational commitment from the end of WW II until the end of the RAF Regiment air defence commitment in 2005 – see Map 1.



Map 1. RAF Regiment Light Anti-Aircraft Squadron deployments 1946-2006.
This does not include out of role deployments in support of field squadron roulements or emergency tours.

Innovation and Cutting-Edge Technology: RAF Regiment Air Defence

From a rather inauspicious start in the air defence role, seemingly picking up the scraps of military equipment, the RAF Regiment soon established a leading role at the forefront of air defence innovation.

Tigercat. Shorts identified an opportunity to sell a land-based version of the Seacat surface-to-air missile, so in 1967 the world's first land-based fully air portable short-range air defence missile system, Tigercat, was brought into service with No 48 Squadron, RAF Regiment. It earned many millions in defence exports sales largely on the back of RAF Regiment sales support teams and demonstrators. It put the Regiment into a world lead in operational doctrine and tactics as well as engineering and logistics for a Short Range Air Defence (SHORAD) missile system; there simply was not another one in the world.

Rapier Field Standard A. As the expected air threat moved from medium-altitude strategic missions to low-altitude strikes, a new weapon system was required with fast reaction time and high manoeuvrability. In 1972 a trials unit known as the Rapier Pilot Battery was formed jointly by No 63 Squadron RAF Regiment and No 9 (Plassey) Light Air Defence Battery Royal Artillery. Comprehensive trials ended in 1973 and the first Rapier unit in British service – No 63 Sqn – deployed to its operational station in Germany in mid-1974.

Op CORPORATE. This year is the 35th anniversary of the operation to liberate the Falkland Islands. At the time of the Argentinian invasion, No 63 Sqn, RAF Regiment was equipped with Rapier Blindfire, held at 7 days' readiness at RAF Gütersloh. The unit was given 48 hours' notice to embark the QE2 which sailed on 5 May 1982. The squadron's laboured landing ashore at San Carlos took 12 hours for equipment and a further 24 hours for all of its personnel, due mostly to rather random loading plans and landing schedules, and echoed similar issues during the Op TORCH landings in WW II. The RAF Regiment provided a Liaison Officer to the Falklands Air Defence Cell, which was manned by the Army, and the joint operation highlighted differences in Army and RAF doctrine (such as 'safe

Spoils of war – one of the ex-Argentine Oerlikon guns of No 2729 Sqn on the live-firing range at Wembury Point operated by HMS Cambridge, the RN Gunnery School. (RAF Regiment Heritage Centre)

lanes' for friendly aircraft – the Army did not employ them), and somewhat familiar issues over C2 – the squadron, as an independent sub-unit with a sole major-equivalent in command, struggled for recognition amongst larger formations. The RAF Regiment was to maintain a continuous commitment to the Falklands from 1982 to 2006.

Oerlikon/Skyguard. One unexpected benefit of the Falklands conflict was the capture of an intact Argentinian air defence battery equipped with Oerlikon guns and Sky-guard radars. A total of fifteen guns and five Skyguard units were captured and later refurbished by BMARC in the UK. Twelve guns and four Skyguards were put into service operated by No 2729 Squadron, RAuxAF Regiment, based at RAF Waddington. A second squadron was added a few years later, with the addition of two more Skyguard radars and the guns being divided between the two units. The RAuxAF Regiment used these guns and radars for about ten years but defence cuts, coupled with rising cost of ammunition and replacement gun barrels, forced the withdrawal from service of the very popular and reliable system. For a while, No 2729 Sqn had had the unique distinction of being the only NATO-declared unit formed entirely from spoils of war.

Rapier Field Standard B1(Modified) (FSB1(M)). This upgrade added a number of enhancements compared to the original version. Additionally, the search radar was upgraded to be easily shut down in

Rapier FSB1 in the Falklands.

case of an anti-radiation missile attack. FSB1(M) included lessons from the Falklands campaign, notably the 'pointing stick' that enabled the detachment commander of a fire unit to point the aiming unit at a target.

USAF Rapier. USAF bases in Germany were protected by US Army air defence units, but those in the UK did not have sufficient protection to ensure compliance with NATO standards. In 1979 the new Prime Minister (Margaret Thatcher) agreed directly with the President of the United States to sell Rapier to the USAF. It was to be deployed on USAF bases in the UK and to be manned by the RAF Regiment. The three squadrons became operational by 1987 and were fully integrated into the US operational C2 structure (basing and peacetime C2 was through home bases and 6 Wing RAF Regiment). Funding for this unique programme ceased in 1994 and the systems and vehicles were handed to the USAF for use on ranges or disposal.

'Caderised' Squadron. Another example of the innovative and ground-breaking approaches taken by the RAF Regiment in the field of air defence was the unique manpower solution that blended regular and reserve manning into one Rapier unit (No 27/48 Sqn, RAF Regiment), utilising the reserve manpower that had been on the Oerlikon Wing. The unit operated FSB1(M) with new upgrades, but only lasted four years, before disbanding.

Rapier Field Standard C (FSC). At the time of its introduction in 1996, Rapier FSC was a world class air defence system and led the way in technological advantages in terms of radar survivability in a heavily electronic counter measure or anti-radiation missile environ-

Rapier FSC. (BAE)

ment. The RAF Regiment led the Operational Conversion Unit for Army and RAF Regiment units, shared command of the Joint Rapier Training Unit, but owned the one Operational Evaluation Unit, which pushed the bounds of system development and truly professionalised the capability.

2004 Defence Command Paper. A far-reaching study into the cost and operational-effectiveness of Army and RAF Regiment Rapier capabilities was conducted in the lead-up to the Defence Command Paper in 2004. Regrettably, this resulted in the decision to withdraw the air defence role from the RAF Regiment and retain it in the Royal Artillery. From a parochial perspective, it was a baffling decision and the criteria were not entirely transparent. The net result was that three RAF Regiment Rapier squadrons were disbanded, and the fourth was converted to the field role, immediately deploying on operations to Kandahar in Afghanistan. For the first time since its inception in 1942, the RAF Regiment no longer had an air defence capability.

C-RAM embraces the Phalanx Close in Weapon System (left) and SAAB's Giraffe AMB radar.

Air Defence in the 21st Century – new threats, new approaches

Moving further into the 21st Century, the RAF Regiment was committed to concurrent operations in Iraq and Afghanistan with field squadrons deployed at Basrah and Kandahar, then Camp Bastion. However, as the threat to air operations has changed, so the requirement to counter it in more novel ways has grown. This is demonstrated perfectly in the employment of Counter Rockets, Artillery and Mortars (C-RAM) and Counter Unmanned Air Systems (C-UAS), and the evolution of Op TESSERAL, the scientific approach to countering the Surface to Air Fire (SAFIRE) threat to friendly aircraft.

C-RAM. At the height of the insurgency in Iraq, Basrah Air Station, or Combined Operating Base, was being attacked with unguided rockets daily, frequently with multiple rockets. Whilst this was often a nuisance, disrupting air operations until operating surfaces could be checked and confirmed as clear, it did cost lives – notably in July 2007, when three RAF Regiment gunners were killed in one attack. An innovative solution was developed that integrated existing technology to provide early warning, a point of origin for counter-battery fire, and perhaps more importantly, an active defence system to protect against the rockets. The system was composed of acoustic sensors, mortar detection radar, the surveillance radar from Rapier FSC, new Giraffe Air Defence Radars and the Close in Weapon System from warships, mounted on flatbed trucks. The RAF Regiment stake in this enterprise was to provide the Project Officer for

deploying the system into Basrah, but also, by a quirk of fate, when the Royal Artillery Battery Commander deployed with his kit and team, the RAF Deployed Operating Base Commander was a former RAF Regiment Air Defence Instructor of Gunnery, so was his Deployed Operating Base Warrant Officer, so was the RAF Regiment Force Protection Wing Commander, his field squadron commander and two of the operations officers on the wing. The poor Battery Commander had to get it right, with all of the air defence expertise watching his every move like a hawk.

C-UAS. This new capability is designed to defeat the growing threat of surveillance and attack from remotely piloted drones – including those available on the commercial market from the likes of Amazon. C-UAS systems are not widely advertised, but there are capabilities in the public domain. Security classification prevents me from discussing the matter in any detail, other than confirming, from open sources, that the Lightweight Surveillance Targeting and Acquisition Radar was deployed at the London Olympics and the G8 Summit in Northern Ireland as part of an integrated C-UAS system, manned and developed by the RAF Regiment.

Operation TESSERAL. The proliferation of man-portable air defence systems (MANPADS) and low-tech threat weapon systems (heavy machine guns, rockets, rocket propelled grenades, small arms, etc) widely available throughout the world, allows adversaries to launch complex, co-ordinated, multi-firer and multi-system SAFIRE against UK aircraft and helicopters. The RAF Regiment has been at the forefront in countering this threat and developed Operation TESSERAL as an integrated range of measures including flight planning, aircraft manoeuvring, electro-optical counter measures, as well as deterrence and disruption of hostile ground forces – where the RAF Regiment plays its part, *fighting on the ground for control of the air*.

Summary

The RAF Regiment has adapted, and survived pressures on budgets, resources and at times, its very existence. It fights on the ground for control of the air, just as its predecessors have done for 75 years, so whilst we now lack the guns or missiles that mark us out as

air defenders in the traditional sense, everything we do is about air protection and it is our familiarity with air operations, and the belief that air operations are the mission that keeps the RAF Regiment relevant.

The themes that this paper has, I hope, highlighted include:

1. Vulnerability of airfields – often forgotten. Cannot trade distance for time.
2. Constant challenge of requirement vs resource.
3. Clarity of C2.
4. Maintaining 'Air' ownership of its own critical enabling capability.
5. Familiarity with 'Air' operations (North Africa, Op CORPORATE).
6. Failure at MoD and Service level to absorb lessons from our own failings.

Throughout its history, the RAF Regiment's commitment to air defence has been one of evolution, adaptation and professionalism. However, new threats require new approaches: the RAF Regiment is still in the air defence game.

Note:

[1] *The Royal Air Force Regiment: A Short History* (RAF Regiment Fund, 4th edition, 1982); *Through Adversity* (RAF Regiment Fund, 1997) and *The RAF Regiment at War 1942-1946* (Pen & Sword, Barnsley, 2002).

CLOSE AIR SUPPORT IN CONTEMPORARY OPERATIONS

Flt Lt Wayne Lovejoy

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Introduction

Since World War I, Service level attitudes towards Close Air Support (CAS) have fluctuated and this has created a pattern of successful employment during a conflict followed by a peacetime period of disinterest. This is mainly because CAS is often seen as too 'Air' orientated for the Army to fully buy into while the tactical effect produced by expensive and highly capable airframes has often seemed wasteful to airmen. This article reflects on some of the predominant conflicts that have taken place since World War II to illustrate these enduring issues in the application of CAS. To accompany this, the strategic consequences of misemploying CAS are illustrated, something that is symptomatic of the change in operating environments particularly when fighting a 'war of choice'[1] and emphasised further in a Counter Insurgency (COIN) campaign. This change in operating environment is further accentuated by the increase of media coverage in contemporary operations where almost anyone with a mobile phone is able to post on social media. This article will therefore look at CAS in contemporary operations through the themes of enduring CAS issues, operating environments and the effect of the media using operational examples from the conflicts in Korea, Vietnam, Iraq and Afghanistan.

What is Close Air Support?

It is important to state here that CAS is not the only mission that an air force has to conduct and often it is not the highest priority mission however, the prioritisation of importance can sometimes mean that it

A Forward Air Controller (FAC) in WW II.

is the predominant mission for the air component. To differentiate it from other missions it is worth re-capping on what exactly CAS is. NATO doctrine defines it as:

> '. . . air action against hostile targets which are in close proximity to friendly forces and which require detailed integration of each air mission with the fire and movement of those forces. The mission must always be supported by a qualified FAC [Forward Air Controller] and is flown in direct support of ground force . . .'[2]

This is extremely similar to US doctrine which only differs in stating that it must be conducted using fixed wing or rotary wing aircraft.[3] There are two key points to extract from this which are important in understanding how the mission is conducted. First, 'close proximity' implies that enemy forces are either close enough to be in contact with friendly forces or, they will be by the time the mission is flown, meaning that terminal attack control will be required to mitigate fratricide.[4] This level of control is conducted by employing 'detailed integration' which uses a high level of coordination to maximise the effect of the air mission whilst supporting the ground

commander's intent and ensuring the safety of friendly forces and aircraft. The second key point to extract from this statement is that a 'qualified FAC' must support such a mission. For completeness, a FAC is described doctrinally as 'a qualified individual who, from a forward position on the ground or in the air, directs the action of combat aircraft engaged in close air support of land forces'.[5] The term Joint Terminal Attack Controller (JTAC) has now replaced the term FAC in UK doctrine and, while there are subtle differences, they will be used synonymously in this article to add clarity to various references.[6]

The Development and Modernisation of CAS

Korea

The Korean War had several distinct phases which, at some point, saw each side rapidly withdraw and advance, as well as holding static lines against one another. These phases directly impacted the significance of CAS; however, there were times when it became absolutely vital to holding the defensive lines and repelling enemy advances. This section mainly focuses on the US employment of CAS as they were the predominant suppliers of it, although examples of both US and UK troops receiving CAS are included.

When the North Korean People's Army first attacked the Republic of Korea (RoK) in June 1950 they met little resistance as RoK military forces retreated south with their UN counterparts. At this point American FACs and the specialist signals unit required to provide the necessary communications were in the US which hampered the use of air support.[7] As the US Army began to arrive in the southern part of the peninsula, the need for a joint service headquarters to enable the coordination of the ground forces with the tactical air force was recognised and a Joint Operations Centre was established; however, it was initially manned only by the Air Force.[8] As FACs began to arrive in theatre they were moved north of Taejon to support forward elements of the 24th Division on the 3rd and 4th July which meant poor support to the retreating RoK and UN troops. The weeks that followed identified limitations in the FACs' equipment, particularly the radios that were fixed in the Jeeps and regularly broke. Additionally, the supporting aircraft were not optimized for providing CAS at such a long range as their limited fuel meant that, unless they

The rapid advances made by the RoK army and the Pusan Perimeter held by UN forces.[10]

received a suitable target immediately after arriving on station, they were unable to provide effective support.[9] In this opening phase of the war, CAS was found wanting due to a poor command and control structure as well as the limitations of the available aircraft and equipment. This illustrates how the CAS system that had been optimised in World War II had been lost due to the recurrent issue of a lack of interest in peacetime.

UN troops secured the southeast corner of the peninsula and formed a defensive line known as the Pusan Perimeter by late August, allowing them to consolidate their capabilities and bolster their numbers. CAS played a crucial part during the six weeks that UN

US Marine Corps F4U Corsairs delivering CAS in Korea.

forces held the Pusan Perimeter as the Fifth Air Force, along with two Marine squadrons provided over 10,000 CAS sorties. This included decisive actions such as when CAS helped the 24th Division repel a fierce four-day attack on the western boundary and between 31 August and 12 September when CAS devastated North Korean forces who were breaking through the perimeter.[11] These incidents show that CAS was absolutely crucial in this early part of the Korean War because, if the Pusan Perimeter had not held, UN forces would have been pushed off the peninsula making any subsequent counter attack extremely difficult. So, just over a month after first arriving in Korea, FACs were employing CAS effectively. However, the defensive posture of the ground forces meant they were relatively static implying co-ordination between air and ground forces was not overly complex and therefore allowed for a period of learning and development.

After this consolidation, UN forces began to push out of the perimeter to re-take the ground conceded to the North Koreans. The ability to concentrate aircraft at a point of resistance meant that CAS could deliver the necessary firepower when and where needed, however, aircrew and ground troops had to adapt their procedures to

support the advance. This adaptation required detailed integration as highlighted in an early attempt to break out of the perimeter when the Argyll and Sutherland Highlanders received CAS to support their assault on Hill 388 (from Hill 282) in late August which resulted in disaster. They had marked their position with panels but the North Korean's had copied them and, with no radio communications between the American pilots and the FAC, napalm and machine gun fire was inadvertently used to attack the British on Hill 282.[12] This emphasises the need for robust procedures to ensure that CAS is provided accurately, as the consequences of fratricide can be devastating to tactical and operational success. It is reasonable to conclude that, had the US and UK invested in CAS prior to the war, a greater understanding of its employment and procedures would have been established.

This fratricide incident did not deter the use of CAS and when the US Eighth Army began to break out of the perimeter it proved to be a battle-winning tactic. Some 286 CAS sorties were flown on the first day of this assault followed by another 361 on the second day, meaning that CAS missions outnumbered interdiction missions, emphasising its importance at this stage of the war. These aircraft formed a wedge ahead of the advancing troops by dropping napalm and firing their machine guns enabled the Eighth Army to cover 170 miles in 11 days.[13] This volume of CAS was achieved because many of the aircraft in theatre had a multi-role capability which meant that, for a short, intense period, air interdiction could be reduced to focus on supporting ground forces.

This early part of the Korean War demonstrates that an underinvested and sub-optimal CAS system was employed at the outset of hostilities. This meant that pilots and FACs were deploying on operations without being proficient in delivering CAS and this had catastrophic implications in the context of fratricide. The ability to mass aircraft at specific points to support a ground assault was identified as one of CAS's strengths in World War II and it again proved be a vital capability in Korea.

Vietnam

There was no RAF involvement in the delivery of CAS in Vietnam but this war illustrates key lessons in the development of CAS in both

A Vietnam-era FAC would typically be airborne in a Cessna O-1 Bird Dog.

delivery and operational context. The US had not invested in CAS after the Korean War and as a result was unprepared to deliver the volume that would be required in Vietnam. As the US began its involvement in Southeast Asia, General John P McConnell, the Air Force Chief of Staff even admitted that employment of tactical aviation had been neglected, meaning that a re-development of CAS systems and procedures would be necessary.[14] The very fact that the US Air Force was not ready to deliver effective, let alone optimal, CAS at the start of this campaign accentuates the recurring pattern of underinvestment, including the squandering of combat experience.

Aside from CAS, it is important to briefly remember the US domestic political context when this war took place. This is important because American attitudes to war were becoming intolerant to US casualties and the independent media coverage meant that the horrors of war, including atrocities, such as the US massacre at My Lai, made it into the US media.[15] This anti-war sentiment became known as 'Vietnam Syndrome' which demonstrated that, even if a campaign was being won on the battlefield, a democratically elected government could still lose the overall war if the electorate was strongly opposed to it or how it was being conducted. The key points here are that the campaign had to be conducted with minimum casualties to US troops and Vietnamese civilians and that all actions had the potential to be reported in the press. These points would be prevalent in Western warfare from this point onwards and would have a direct impact on the delivery of CAS.

Prior to 1964 the whole American command and control system in Vietnam was notoriously complex due to its incremental growth, inter-service rivalry and political constraints.[16] These complexities

were present throughout all three levels of the command and control structure. At the tactical level there were not enough trained personnel and at the intermediate level there was only a handful of officers with the appropriate authority to request air support. Added to this was the requirement for the targets to be passed up parallel civilian and military chains for higher level approval and this substantially lengthened response times. This led to a USAF team concluding that, 'The high-level approval required for on-call fighter strikes, along with poor communications and/or procedures for requesting strikes, builds in excessive delays for efficient use of the tactical air effort.'[17]

In an attempt to resolve these issues, an overhaul of the CAS command and control system was conducted in 1964. This restructure aided the effectiveness of CAS by substantially decreasing response times for immediate requests while increasing the liaison capacity between supporting aircraft and the supported ground unit. This led to immediate requests generally being supported within 20 minutes by an aircraft that was already airborne or 40 minutes by one on strip alert. In 1972 a study group established that '50 percent (of immediate requests) were supported within 15 minutes, 75 percent within 20 minutes and 100 percent within 40 minutes'.[18] This command and control restructure included the creation of a Tactical Air Control Centre that coordinated the four Direct Air Support Centres who, in turn, would each service their own FACs. This created a system that had direct requesting chains that were easy to follow and gave an appropriate amount of autonomy at each level. This system was created out of necessity and meant that inter-service rivalry was temporarily put to one side to achieve a common goal.

Communication equipment, specifically radios, became more available as the campaign progressed and wartime necessity provoked investment and development in these technologies. This allowed the required communications networks to be established using VHF, UHF, HF and FM radios which meant the new command and control structure could be fully utilised.[19] This allowed FACs to terminally control supporting aircraft permitting detailed integration, even in dynamic situations where ground troops might be manoeuvring.

Vietnam appears to have been the conflict in which the US realised the necessity of CAS, probably because it played such a substantial part in how the ground campaign was conducted. Not only did CAS

Apart from streamlining procedures in order to minimize response times, the long war in Vietnam permitted the development of aircraft optimized for CAS and FAC-work, like this OV-10, using a rocket to mark a target on which the accompanying F-100 will deliver its ordnance.

create opportunities for ground forces to manoeuvre but it also reduced the tactical risk to them. As General Momyer stated; 'The characteristic engagement was one in which our ground forces located the enemy and kept him in sight while waiting thirty to forty minutes for the fighters to arrive.' Additionally, it was noticed that when this tactic was employed it significantly reduced the number of friendly casualties.[20] The importance of reducing risk to US soldiers in Vietnam was vital in countering the anti-war movement in the US as tactical victories with high US casualties were often portrayed negatively in the media. Therefore, by CAS reducing US casualties its tactical application was actually having a strategic effect.

Iraq (1990-1991)

When the US led coalition upheld UN Resolutions 660 and 678 to 'restore international peace and security' and to ensure that Iraqi troops withdrew from Kuwait, a focused air war was executed.[21] Even though air power advocates, such as Colonel John Warden, saw a need for only strategic airpower, the Joint Force Air Component Commander (JFACC), General Horner, recognised that some CAS missions to support the ground war should be anticipated. As the ground phase neared he emphasised this, stating: '. . . there are people's lives depending on our ability to help them if help is required. So, I want a push put on. I want people feeling compulsion to hit a target. I do not want fratricide.'[22] This direction translated into a 'Push CAS' system being implemented which meant CAS-capable aircraft would arrive over a likely target area, and if there were no immediate targets they would hold for a short while before moving on

to conduct interdiction strikes.[23] When the ground phase was executed there was little Iraqi resistance which meant only a limited requirement for CAS, even though a responsive system was in place. However, the JFACC's insistence upon an effective system being in place indicates that CAS was deliberately planned so a suitable system was implemented, unlike previous campaigns.

Iraq (2003-09)

During the coalition's invasion of Iraq in 2003 US forces raced to Baghdad and the tactical level targets that stood in the way of them were elevated in importance because of the need to keep advancing. The rapid advance of these forces meant coordination measures for air delivered munitions had to be refined so the Killbox system replaced the more conventional Fire Support Coordination Line (FSCL). This allowed Killbox Interdiction to be conducted so that friendly forces could keep moving and FACs only had to conduct CAS when ground units met pockets of resistance. The vast amount of ISTAR coverage meant that aircraft could be directed against Iraqi forces in these Killboxes before they could affect the advancing ground forces. This system proved to be so effective that some Air Force thinkers began questioning the need for terms such as CAS and interdiction.[24] This blurring of the missions transcends into official US Air Force statistics from the conflict which show Killbox Interdiction and CAS combined were apportioned 51% of the Air Component's combat capability. When the campaign was executed, Killbox Interdiction and CAS actually accounted for 79% of the targets hit, illustrating the overwhelming need for these missions.[25] This campaign was thoroughly planned for and, central to it, was the ability for ground forces to move rapidly across Iraq which was reflected in the target sets attacked by coalition aircraft.

CAS was subsequently used in the counter insurgency (COIN) campaign that followed the toppling of Saddam Hussein's regime. Coalition Special Forces utilised CAS in their pursuit of high value targets, however this target set was no longer tanks and artillery but named individuals. These individuals were intercepted by Special Forces but CAS platforms provided high resolution sensors that could zoom into the streets of Baghdad and track individuals whilst a multitude of weapon systems on a variety of air platforms could

While sophisticated equipment, like the portable Harris PRC-117 SATCOM link being deployed here by an RAF Regt JTAC team, had been available for some years, its use became increasingly widespread during the campaigns in Iraq and Afghanistan.

provide accurate fire support for the dislocated teams. As the airspace was not contested, multiple aircraft were able to work to a single JTAC, meaning that one ground team could have attack helicopters, AC-130 gunships, several fast jets and multiple ISR platforms supporting them for the duration of a mission.[26] This is in stark contrast to conventional warfighting where a single aircraft may strike a single target before moving to the next JTAC or mission. Using CAS in a complex urban environment is not without problems however, as, broadly speaking, the main objective in a COIN campaign is the support of the people, so when residential areas are being struck by air-delivered munitions popular support is easily lost.

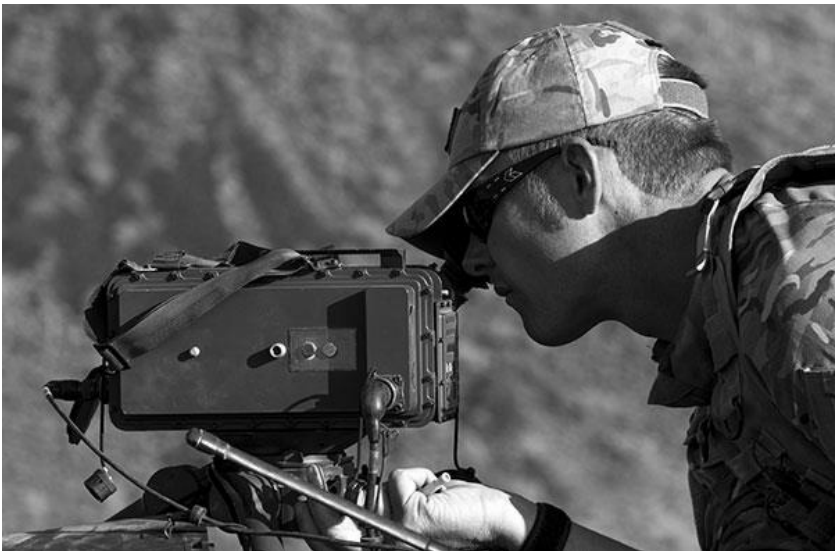
This whole campaign was well documented by the world press. In 2003 television crews and reporters were in Baghdad sending real time reporting of the coalition air strikes while others were embedded with the advancing ground forces. As this was a controversial 'war of choice' the media scrutinised the Coalition's actions and tactical victories were turned into operational losses. Reminiscent of the American experience of Vietnam, the loss of support from the local population or the electorate at home would see strategic defeat. As the

RAF Regt JTACs exercising with USAF A-10s on Grayling Range, MI, USA. The laptop permits them to see images transmitted from the aircraft's targeting pod in real time.

campaign turned into a COIN operation CAS came under scrutiny because the weapon systems used have a far greater impact than small arms due to the size and effect of the air delivered munition.

Afghanistan (2001-2014)

The most recent campaign in Afghanistan demonstrated how CAS can be employed in a variety of ways during various stages of a campaign; from the initial theatre entry of Special Forces through the years of stabilisation to the withdrawal of large scale conventional forces. The timeline for CAS in Afghanistan is very useful to study and actually illustrates an evolution in procedures steered by strategic and operational direction of the broader COIN campaign. During the initial phases, the rules of engagement allowed for a more conventional warfighting mind-set, however, as time progressed and the strategic implications of the destruction caused by CAS became evident, rules of engagement became more restrictive. This creates a



The use of laser designators, in this case by an Army JTAC, permits precision delivery of CAS.

balance that must be struck at a strategic level; overly restrictive rules of engagement could endanger one's own troops whereas loose rules of engagement increase the risks to the local population whose support is crucial.

The initial operation against the Taliban in 2001 began with the insertion of small teams of coalition Special Forces to raise local armies and militias to fight against the Taliban and Al Qaeda. The geographical disposition of Afghanistan meant the only viable means of fire support was CAS and long-range bomber aircraft because of their substantial endurance and large payload. American B-52 bombers with high-fidelity targeting pods were used to conduct CAS dropping GPS-guided bombs onto coordinates generated by JTACs on the ground. The bombers would orbit the general area waiting to receive target data and, once the requesting JTAC had sent it, the target could be destroyed within minutes.

As other CAS-capable aircraft were forward-based both the numbers and types of platforms that they could support increased. However, due to systemic failures in planning, these aircraft struggled

to provide support when larger forces deployed for Operation ANACONDA (March 2002), denying ground troops both responsive and effective CAS. This was exemplified on the first day of ANACONDA when the B-1B tasked with striking targets, prior to ground troops arriving, suffered a technical problem and the replacement aircraft along with a pair of F-15E's received a spurious message to cease their attacks. To compound the situation: a convoy of Afghan militia working with the coalition was struck by an AC-130; procedural control was poor; the airspace was too congested and the Taliban and Al Qaeda put up more resistance than anticipated.[27]

In light of this, several charges were levied by the US Army against the USAF's delivery and execution of CAS during this operation which the Air Force Chief of Staff, General John Jumper examined personally.[28] This examination subsequently led to a CAS Conference in Kuwait to discuss these failures and those involved 'agreed that poor performance in ANACONDA was due to unsatisfactory procedures and execution'. In particular, that there was a presumed knowledge shared by JTACs, aircrew and those staffing the command and control network.[29] This situation is reminiscent of several historical campaigns where the delivery of CAS has been sub-optimal at the start of a campaign and in this instance both the knowledge and capability existed so it was essentially down to poor integration of the components and units involved.

In 2006, there was a large-scale deployment of coalition ground troops to Afghanistan and the system in place to provide CAS for them was overhauled. This new system was thoroughly tested that year with NATO and US aircraft being required for more than 11,528 CAS missions during which they dropped 2,644 munitions, ten times more than the previous year.[30] This increased further in 2007 to 12,775 CAS missions and, excluding 20 and 30mm cannon and rockets, 2,926 munitions were dropped, putting both of these years in stark contrast to 2004 when only 86 CAS missions employed munitions.[31] The system stood up well to this test, proving that a suitable CAS command and control system is vital to support a large campaign that generates a huge volume of CAS requests. In addition to being able to handle the volume of aircraft, this system was still required to be responsive, particularly when immediate requests came

The Rockwell Collins StrikeHawk, which is in service with British JTACs, includes a tablet PC, a laser range finder, a laser target designator, GPS, day/night optical devices and the ability to receive real-time video downlinks from aircraft targeting pods, which, combined with a PRC-117 or a hand-held PRC-152 radio, both supplied by Harris, and both capable of providing VHF, UHF and satellite voice and data communications, represent the current state of the art.

in during the execution of the Air Tasking Order. This was partially managed by providing airborne and strip alert aircraft that were ready to respond to unforeseen incidents. This successful system was the product of the systemic failings of ANACONDA which prompted high-level direction to address these issues illustrating that, with time, the CAS system can be rectified to become optimal.

As military operations increased during 2009 and 2010 so did the number of civilian casualties, and while it is difficult to distinguish how each person became a 'weapon-wounded patient' it is reasonable to assess that the increased proportion of air-delivered munitions would have contributed to this.[32] The importance of addressing this issue was emphasised in 2009 when the Commander of the NATO mission in Afghanistan (COMISAF), General McChrystal released his Tactical Directive. The directive addressed concerns over civilian

casualties as well as damage to property, which were having a derogatory effect on the overall COIN campaign. In it he stated that NATO, 'must avoid the trap of winning tactical victories – but suffering strategic defeats – by causing civilian deaths or excessive damage.' Commanders were also told that they, 'must weigh the gain of using CAS against the cost of civilian casualties.'[33] COMISAF's direction encapsulates the issues associated with employing CAS in a COIN environment, as opposed to a conventional campaign, that are summarised in the term 'courageous restraint'.

The campaign in Afghanistan has highlighted the complexity of operating as part of a NATO-led coalition on expeditionary operations. The requirement to use CAS in 'wars of choice' to reduce the risk to one's own ground forces with the almost contradictory constraint to minimise, and preferably negate, any collateral damage is very difficult to manage. This issue is clear to see at the tactical level where the fighting is taking place but the greatest impact is at the strategic level where a campaign or home support can be won or lost.

Summary

The employment of CAS in contemporary operations comes with many considerations some of which are routinely forgotten. The enduring issue of peacetime underinvestment followed by an urgent requirement can be seen throughout the case studies in this article and this is predominantly down to financial constraints and inter-service rivalry. The type of warfare being conducted has a great deal of influence on its application. This is noticeable in the comparison between Horner and McChrystal's direction; the former during major combat operations and the other during a delicate COIN campaign. The independent media's ability to report from a war zone became apparent in Vietnam and this ability grew with technology to a point where almost everyone with a mobile phone and an internet connection could broadcast in some way or another. This ability to report from anywhere converged with the high proportion of CAS that was delivered in Afghanistan and led to intricate reviews of operating procedures as tactical effects had strategic consequences. When taken together these issues indicate that significant attention should be paid to CAS now because, when it is employed in the future, every strike could be analysed by a news team while each death of one's own

troops will be examined by families. CAS is absolutely required to reduce risk and facilitate manoeuvre and it is needed from the very outset of a campaign, now that these lessons have been re-learnt in modern times and are well documented it should be difficult to justify if this is not the case.

When this paper was read at Hendon it concluded with the presenter's personal account of the conduct of a specific action in Malgir, Helmand Province, Afghanistan during the summer 2010. Although the nature of the delivery did not lend itself to reproduction in print, it provided a graphic illustration of the way in which multiple air assets were integrated within the local ground commander's scheme of manoeuvre to deliver air-to-ground fire and facilitate medical evacuation.

Notes:

[1] A 'war of choice' may be defined as one which a government could afford not to fight without risking anything of consequence, but one that it nevertheless decides to fight. This is in contrast to a 'war of necessity' which a state must fight in order to preserve its security and/or independence. **Ed**

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[3] Joint Publication 3-09.3: Close Air Support (2009), pI-1.

[4] AP 3002 Second Edition, Air and Space Warfare (HQ Air Command), Chapter 10-8.

[5] ATP-3.2.1.1(C), Tactics, Techniques and Procedures for Close Air Support and Air Interdiction (2011), p2-1.

[6] Joint Service Publication 918 (2015), p1.

[7] Schlight, J; *Help From Above: Air Force Close Air Support of the Army 1946-1973* (US Air Force History and Museums Program, Washington DC, 2003), pp118-120.

[8] Futrell, R F; *The United States Air Force in Korea 1950-1953* (Office of Air Force History, United States Air Force, Washington DC, 1983) p878.

[9] *Ibid*, pp879-80.

[10] Map from Barnes, M; 'An Overview of the Korean War', http://www.authentichistory.com/1946-1960/2-korea/1-overview/ (accessed 26 March 2017).

[11] Schlight, J; *op cit*, p127.

[12] Bolté, P L; 'An Infantry Platoon Leader in the Korean War' in J Neufeld and G M Watson Jr, ed; *Coalition Air Warfare in the Korean War 1950*-1953 (Washington DC, 2002), p195.

[13] Schlight, J; *op cit*, p132-133.

[14] Costello III, P A; *A Matter of Trust: Close Air Support Apportionment and Allocation for Operational Level Effects*' (Maxwell, Air University Press, 1997), p17.
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[19] Sbrega, J J, *op cit*, p431.
[20] *Ibid*, p469.
[21] UN Resolutions 660 and 678: http://www.un.org/en/sc/documents/resolutions/1990.shtml (accessed 1 August 2014)
[22] Keaney, T A and Cohen, E A; *Gulf War Air Power Study: Summary Report'*(Office for the Secretary of the Air Force, Washington DC, 1993), p22.
[23] *Ibid*, p51.
[24] Budiansky, S; *Air Power: The Men, Machines and Ideas that Revolutionized War, From Kitty Hawk to Iraq'* (Penguin, London, 2004), p439.
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OPERATION MEDUSA AND THE LOSS OF XV230

Air Cdre Frank Clifford

Commissioned in 1984, Frank Clifford initially served in RAFG on Rapier and Harrier units. Subsequent deployments took him to the Gulf, for Op GRANBY, Zimbabwe and Cyprus. After a stint with the UN in Abkhazia and Georgia, he commanded the UK element of the Kosovo Protection Corps before, by now OC 2 FP Wg, assuming overall responsibility for the defence first of Kandahar and then of Basra. After tours at the MOD, with the PJHQ and as OC High Wycombe, he went to Sierra Leone before returning to the MOD in time to participate in the 2015 SDSR. He has filled his current appointment as Force Protection Force Commander for the RAF since May 2016.

Operation MEDUSA was a major Canadian-led operation, starting in early September 2006, designed to remove the Taliban from the Panjawii district of Kandahar Province. One of its aims was to reopen the main highway between Kandahar and Helmand District. Over recent years the Taliban's strength had grown considerably in this area and, rather than using their normal insurgent hit-and-run tactics, it had decided to make a fight of it. At the time, it was assessed that their force numbered several hundred, located in well-prepared positions to a depth of 20 km around the Arghandab river.

The Canadian Task Force's mission was to destroy all insurgents in the MEDUSA Area of Operation. The Operation was scheduled to start at first light on 2 September. Preliminary operations had been ongoing for several weeks and it was during this period that it became clear that the Taliban intended to stand its ground. Quite naturally, therefore, the Canadian Commander, Brig-Gen David Fraser, had concluded that he would need all of the combat power available to him in order to carry out his assignment.

C Squadron of 2nd Battalion, Royal Canadian Regiment (RCR) was located at Spin Boldak on the Afghanistan-Pakistan border and controlled a free-fire zone forward operating base (FOB) designed to hold this strategic crossing point between Pakistan and Afghanistan.

The stark contrast in the firepower provided, and the degree of protection afforded, by the WMIK[1] Land Rovers available to the RAF Regiment (above) and the LAVs[2] fielded by the Canadians, is evident from these pictures.

In order to permit the Canadian LAV[2] squadron to participate in Operation MEDUSA it had been decided that elements of No 34 Sqn RAF Regt would undertake a 'Relief in Place' and take control of the Spin Boldak FOB. After hasty battle orders and a brief planning session, the newly arrived 2IC of No 34 Sqn, Flt Lt Ed Cripps, set off with a reinforced B Flight, including two mortars and a sniper pair, bound for Spin Boldak.

The small convoy made the 120 km journey in Land Rovers General Service with wetted down sandbags offering some limited protection against the mine and Improvised Explosive Device (IED) threat, immediate fire support being provided by lightly-protected WMIK[1] Land Rovers. They were supported on their journey by a USAF B-1 in the near overhead with a cab-rank pair of A-10s on call to provide close air support (CAS) if required. Arriving without incident, Flt Lt Cripps relieved the Canadians in place, the latter regarding the UK's lightly protected vehicles with some amazement. Cripps spent the next two hours registering targets for the mortars with a somewhat extravagant use of high explosive ammunition. B Flight operated successfully from the FOB for the next week or so but took no further part in Operation MEDUSA.

Operation MEDUSA started, as planned, at first light on 2 September. Just after midday, the Joint Defence Operation Centre (JDOC) operated by No 2 RAF Force Protection Wing at Kandahar Airfield (KAF) received word that it was to prepare to assist in an incident involving an aircraft of *Ariana Afghan Airlines* that had reportedly gone down 25 km to the west of KAF with 200 souls on board. This was rapidly corrected to a UK multi-engine aircraft – type unknown. Since the RAF was not yet operating its TriStars into Kandahar, the initial assumption was that a C-130 must have crashed. However, it transpired that a Harrier pilot had seen the aircraft explode at 3,000ft and it was soon confirmed that it had actually been XV230, a Nimrod MR2 that had been supporting Operation MEDUSA.

C Flight of No 34 Sqn, commanded by Fg Off Tony Ward, which was providing the Quick Reaction Force (QRF) for that day, was placed on immediate readiness. A US para-jumper had already been on the scene and it was soon established that the mission would be a recovery, rather than a rescue. The RAF Regiment QRF, accompanied

Nimrod XV230. (Steven Hadlow)

by a Canadian EOD[3] detachment, US fire fighters and a specialist advisor, quickly boarded a US CH-47 and flew to the site of the incident. The area surrounding the crash was quite close to Taliban positions and severe fighting was visible only 6 km to the north. Already on the scene, providing an outer cordon for the crash site, was a Canadian mechanised infantry company from the Princess Patricia's Canadian Light Infantry, equipped with LAV and Coyote vehicles, which had been diverted from Operation MEDUSA.

Once on the ground, OC C Flight and his SNCO, Sgt Ballister, linked up with the Canadian Company Commander and set about securing the crash site. It was apparent from the extent of the devastation that recovery of the deceased was going to be a grim task. Nevertheless, despite having to be carried out in a particularly unstable location, it was done with the utmost dignity. In what remained of the day, the men of C Flight completed the recovery operation which continued until last light when they were obliged to withdraw into defensive positions. There they remained until daybreak when they resumed the recovery of the deceased plus the remains of any identifiable pieces of sensitive equipment that had been on board XV230. It was during this initial recovery period that a sharp-eyed gunner spotted and recovered the flight data recorder.

While Fg Off Ward was supervising the recovery of the deceased, in the JDOC back at KAF it had become clear that the Canadians engaged in MEDUSA were encountering stiff resistance and, to sustain their offensive they would require all of their resources. It was likely, therefore, that the LAV company currently providing intimate support to the recovery operation might soon be withdrawn, and at

short notice. By this time, a large inquiry team, tasked with investigating the loss of the Nimrod, had been assembled in the UK and this was now *en route* for Kandahar. It had also emerged that, prior to the crash site being secured, it had been overrun by locals from two nearby large villages in the area.

With the integrity of the site already compromised and the likely withdrawal of the Canadians, it was considered that it might soon be necessary to reinforce C Flight with elements of Support Weapons (SW) and another two sections from No 34 Sqn. The SW Flight continued with its extended fire mission that night in the defence of Kandahar Airfield before preparing their equipment for the following day's anticipated redeployment.

At the same time, OC 34 Sqn, Sqn Ldr Parkinson, was tasked with deploying to the crash site at first light with a member of a Combat Camera Team (CCT) and the Chief of Staff (COS) of No 903 Expeditionary Air Wing (EAW). Specified tasks for OC 34 Sqn included drawing an imprest of $100K from which to pay the locals for anything considered to be an essential item that had been removed from the wreckage. The CCT and COS 903 EAW were to take as many photographs as possible and record and recover anything that might conceivably be of any use to the inquiry. This small team was flown to the site in a Lynx and spent five hours on the ground.

In view of the impending departure of the Canadian security screen, the reinforcement decision was confirmed and late in the morning of 3 September, the SW Flight and two sections from A Flight were flown to the crash site in a Chinook (SW, incidentally, had conducted a lengthy fire mission overnight, expending in excess of 100 rounds of 81mm ammunition). The A Flight personnel deployed with 'belt kit and day sack' with as much food, ammunition and water as they could carry, including an 81mm HE 'Greenie' per man.[4] SW Flight took belt kit and a Bergen[5] filled with food, water and more 81mm Greenies. OC SW Flight, Flt Lt Neil Beeston, was told to be prepared to stay 'for up to 72 hrs' and, if possible, to hold the ground for the Board of Inquiry team to examine the crash site.

Flt Lt Beeston states:

> 'On arrival, the smell of burnt aviation fuel was immensely strong, with the actual crash site a distinctive blackened patch

'The ground was too hard to dig down into, so they started to 'build up' . . .'

> set against the bright sand/soil. The main fighting for Op MEDUSA was a couple of km to the north, but the crump of mortars, artillery and air strikes was clearly audible. A crowd of approximately 400 locals were camped on any vantage point available looking at us and the Canadians. C Flt had by this stage recovered the deceased, which, with as much dignity as possible, we swiftly loaded onto the Chinook which then departed back to KAF.'

SW Flight then set about preparing positions for the mortars. The ground was too hard to dig down into, so they started to 'build up' next to a ditch which ran SW to NE through the crash site. For the next 12 hours, while work continued on the site, back at KAF pressure was being applied to keep the Canadian LAV Company, still providing the outer cordon, *in situ*. By mid-afternoon, however, Brig-Gen Fraser had decided that he had to push on to his next objective and he needed his LAV Company to provide flank security for the next assault. Witnessing the departure of a full armoured company, complete with 25mm cannons, was a sobering experience for the dismounted personnel of No 34 Sqn.

The broken terrain of the crash site with local Arabs in possession.

Once the Canadians had collapsed the outer cordon and departed, the Afghans from the local villages swarmed over the crash site, simply ignoring No 34 Sqn's defensive positions. The vast majority of them just wanted to pick their way through the remains of the aircraft and salvage whatever they could, scrap metal being a precious commodity, but there were also a number of 'Fighting Age Males' who kept their distance whilst observing the RAF Regiment personnel. Interestingly, the villagers also kept their distance from these individuals and it soon became apparent that they were counting weapons and assessing the firepower available. The plan to hold the ground for the Board of Inquiry team was rapidly unravelling as the locals continued to remove anything that had any value, perceived or actual, from the scene. At this stage Fg Off Ward made contact with the JDOC on the only means of communications that worked, an 'Arrian' mobile phone with $6 of credit, and stated, 'Sir – my position is untenable.'

Calling in a personal favour with Commander KNIGHTHAWK[6] generated a pair of Chinooks with AH-64 escort to recover all personnel and equipment. C Flight went on one, SW and A Flights on the other. While the squadron had been deployed elsewhere, the insurgents had taken the opportunity to increase their rocket attacks on Kandahar. So, on arrival back at KAF, A and C Flights immediately re-set themselves for patrols to resume the defence of the airfield and QRF whilst SW were able to get a brief rest before going back out to the mortar line that night.

The following day, the Inquiry team from the UK reached

Local villagers scavenging for scrap metal.

Kandahar. For them it must have been stepping into a different world. The Canadians had just started to cross the Arghandab river; they had previously prepared by fire using two months' stock of 155mm ammunition in just one night! A company of the RCR on the start line to cross the river, which was being supported by almost continuous CAS, was unfortunately strafed by an A-10, killing two soldiers and wounding another thirty; these were the troops who had, until recently, been securing the crash site with No 34 Sqn. Medevac flights were bringing the casualties back into the Role 3 hospital[7] at Kandahar in a continuous stream. Harriers were returning only twelve minutes after taking off, having expended all stores. For those members of the Board of Inquiry team who had been behind a desk in Abbey Wood only 48 hours previously, the shock was palpable.

The President of the Board was briefed on the plan to heli-insert his team into the crash site at first light the following day, each member of the team to be escorted by a gunner from No 34 Sqn, with fire support to be provided initially by AH-64s and then, if necessary, fixed wing CAS. The ground situation at the crash site was explained, including the extent of local scavenging for anything of value, as was progress on Operation MEDUSA. At this stage, the President was presented with the flight data recorder and the hundreds of pictures taken by the Combat Camera Team and had the opportunity to

interview the Harrier pilot who had actually witnessed the incident.

The President concluded that, since there was little likelihood of any further useful evidence being recovered, the risks involved in mounting a visit to the crash site could not be justified. In the event, the evidence produced during the frantic 48 hours spent on the ground had indeed provided sufficient information for the Board to determine what had caused the loss of XV230 and the death of all on board.[8] It was also used later to support the work of Charles Hadden-Cave which has had such a lasting impact on the RAF.

On 12 September, a sombre ramp ceremony was held at Kandahar when the remains of the fourteen men who had died in the Nimrod were loaded onto a C-17 prior to being flown back to Kinloss. But No 2 RAF Force Protection Wing, including No 34 Sqn, was unable to attend because, having the majority of the 15,000 personnel on the base on parade presented a significant target. Clearly, this had to be afforded appropriate protection and No 34 Sqn, and its attachments, were all on active duty within the Kandahar GDA[9] for the duration.

1 WMIK – Weapons Mount Installation Kit.

2 LAV – Light Armoured Vehicle; in this specific case, the Canadian LAV III 8×8 Infantry Fighting Vehicle, but also embracing the very similar, but earlier, Coyote.

3 EOD – Explosive Ordnance Disposal.

4 'Greenie' – colloquial British military name for a plastic container holding two bombs for an L16 81mm mortar.

5 Bergen – standard issue rucksack for British Armed Forces.

6 Task Force KNIGHTHAWK, a US element of Combined Task Force AEGIS (which included a UK component), specifically the 2-10 Aviation Regt, 10th Aviation Brigade of the US Army.

7 A Role 3 hospital is normally associated with Division-level size and scope and provides correspondingly sophisticated care compared to a Role 2 (Brigade) or Role 1 (unit) facility.

8 For a discussion of the causes of the loss of XV230, see HC 1025, 'The Nimrod Review' by Charles Haddon-Cave QC, which is available on-line at http://www.hse.gov.uk/offshore/ageing/kp4-nimrod.pdf **Ed.**

9 GDA – General Defence Area.

AFTERNOON DISCUSSION

Mike Meech. When employing Close Air Support, there has always been a problem with friendly fire. It happened many times in both World Wars, of course, and Wayne referred to the incident involving the Argyll and Sutherland Highlanders in Korea. One also thinks of the Royal Marines at Suez, for instance, and of British armoured vehicles being shot up by A-10s in both Gulf Wars. Do you think that we have got that sorted out now?

Flt Lt Wayne Lovejoy. In a word, broadly-speaking, and procedurally – Yes – but there will always be human errors. We use fixed-format messages to describe the situation and brief the crew, and if the pilot has any doubts these can be resolved by discussion with the JTAC over the radio. This should be very specific, for example if there is a group of people, their surroundings should be thoroughly described to differentiate it from every other group of people. The next few years will see the introduction of digitally-aided CAS. The JTAC will use a device, something like an iPad. The JTAC will be able to mark the precise location of the target on the screen and send the image to the aircraft in real time; the pilot will then prosecute on the data generated. I think that that will be as good as we can get, but there will always be mistakes – we are human.

Air Cdre Frank Clifford. In a previous appointment, I was responsible for Operational Requirements arising from experience in Iraq, Afghanistan and elsewhere. There are technological solutions to the friendly fire problem, but they aren't perfect. Taking Afghanistan as an example, it was a coalition effort, so there were troops and aircraft, of several different types, fielded by many nations – and they were equipped to different national standards. So long as that remains the case, there will always be problems with technology because some systems may not be mutually compatible. The work-around, as Wayne said in his presentation, is procedure – which can be standardised and followed by all participants – and if it is implemented by properly qualified controllers on the ground, then the likelihood of error will be significantly reduced.

Wg Cdr Jeff Jefford. Wayne – were you embedded with an Army unit in the incident that you described? Was that a common practice –

for the Regiment to go out with the Army? I am assuming that, since it was out in the field, this would not have been an RAF Regiment patrol.

Lovejoy. I was attached to a Royal Marine formation for this tour and that is who I was on patrol with. There were RAF Regt JTACs throughout Helmand, the majority of whom were permanently posted into the Army Brigades. The general construct was a four-man Tactical Air Control Party (TACP) embedded within the Battle Group HQ then each of the four Company level JTACs would work to this TACP. The RAF Regt was responsible for the Force Protection of Camp Bastion and the RAF Regt TACP and JTACs that were based there were solely under an Air Chain of Command.

Jefford. So, it was not an exclusively RAF Regiment business – there were Army JTACs?

Lovejoy. Yes, mostly Royal Artillery with a handful of other cap badges.

Wg Cdr Lee Taylor. In that context, I spent some time as SO1(Plans) in the Force Protection (FP) Headquarters so I was responsible for delivering some of the structures and trained manpower for the FP effort across the whole of the Defence establishment. What Wayne described was an evolutionary wartime arrangement – because we were at war at the time, of course. What we have now is RAF Regiment personnel embedded within Army and Royal Marine formations – on a permanent basis. That provides excellent cross-Service integration which, in turn, allows us, not least through the efforts of Wayne and rest of the staff of the Air Land Integration Cell at Honington, to set the standard throughout the Joint Terminal Attack Controller community.

Air Chf Mshl Sir Richard Johns. Since we have few minutes in hand, I am going to take this opportunity to invite Air Cdre Clifford to give us a few words on the RAF Regiment's contribution to the Special Forces Group – within the constraints imposed by operational security, of course.

Air Cdre Frank Clifford. We have Forward Air Controllers – JTACs – and some other individuals embedded with the Special

Forces. They all do the very demanding selection course and, once they are accepted and qualified they tend to stay there for most of the rest of their careers. We also have personnel located permanently with the Special Forces Support Group (SFSG) – a reinforced flight working alongside members of the Royal Marine commandos and elements of the Parachute Regiment. The SFG can deliver effect whenever and wherever it may be required – globally – and it includes, of course, a JTAC capability. So, the RAF Regiment is well-represented within the Special Forces community and, even while I speak, there are a number of Regiment personnel out in the field, some of whom will be calling in air strikes in Iraq.

Johns. Thank you. We are covering a range of the Regiment's activities today, but I thought it was worth bowling the Commandant General that fast ball because few people are aware of just how influential the RAF Regiment is in the delivery of combat power across the whole spectrum of military activity.

AVM Nigel Baldwin. Apart from being involved with the RAF Historical Society, since leaving the Service twenty-odd years ago, I have spent a lot of time working with the charity Combat Stress. How did your people cope with the drama associated with the awful consequences of an aeroplane falling out of the sky – the last thing that they would have been expecting. How did they recover from that – indeed, have they recovered from that?

Clifford. Most of the people directly involved in the recovery operation were quite unprepared. They had no idea what they were going to be confronted with, or what their task was going to be, and we were not well-equipped. We had no appropriate specialist equipment or clothing available at the time – we even had to acquire body bags from the Americans. Two of the gunners found it very hard and they eventually sought help from Combat Stress. Interestingly, members of the RAF, as distinct from the Regiment, who were even more unprepared, suffered even worse. A team of three or four men, led by No 34 Sqn's warrant officer, had been detailed to receive the deceased from the Chinook when it arrived at Kandahar and convey them to the morgue, but in the event, there was an incident that took priority and they were diverted elsewhere. Gp Capt Robertson was

obliged to use clerical personnel, from the HQ for this task. Those people, who had been routinely undertaking general administrative duties were suddenly confronted by a completely different world and it came as a considerable shock. One man and one lady in particular took it really, really hard.

Gp Capt Jock Heron. Air Cdre Clifford's presentation, and Flt Lt Lovejoy's, both presented a very different image of the Regiment compared to its traditional task of protecting an airfield. Those of us who are, or have been, in the Services can understand the value of what you are contributing, and indeed be impressed by your expanded capabilities, not least the integration within Special Forces, but is this apparent to politicians, and perhaps the Treasury, who might well ask what the RAF Regiment is doing so far out in the field – 'Isn't this Army stuff?' Do you see a public relations problem? Do you feel the need to 'sell' the Regiment more aggressively?

Clifford. I do understand what you are getting at, but I don't think that it is a problem. We have to adapt the way in which we fight in the future, as we have had to do in the past. With the next generation of jets costing about £100M apiece, I don't see our F-35s being parked at Kandahar to be used providing conventional GCAS. They are such valuable assets, that I think it unlikely that we shall often be basing them in such a risky environment. I see us operating them from secure sites, like Marham, or from an aircraft carrier, or from Cyprus, but I doubt that, in the future, we will often be required to establish and defend the perimeter of a primitive bare base for a protracted period of time in order to protect such a platform. So, we will obviously need to develop new skills and capabilities, and the Regiment has a well-established track record of working both on and off base to counter a multitude of new hazards. Once again, we are in a period of adapting to meet the needs of a re-equipped RAF with the capabilities that we now have in our inventory

So far as our participation in MEDUSA in Kandahar was concerned, was that 'protection of the airfield'? Not directly, of course, but there were RAF people involved on the ground and the Taliban did represent a specific threat to the airfield facilities. Similarly, the loss of XV230 occurred well off base, so the Regiment's involvement there was clearly nothing to do with

defending Kandahar. But it was an air force incident and it was entirely appropriate that we should have been looking after our own. Recovery of the bodies could have been done by another agency, of course, but probably not for a couple of days, and I considered that to be unacceptable. It was also appropriate that the site should be secured, and the wreckage protected, by personnel who were familiar with aircraft and thus able to make informed decisions on the ground.

Protection of airfields is still the core function of the Regiment, of course, and the sophistication and destructive power of modern infantry-style weapons means that is possible to wreak havoc on an air base and, unless you understand the environment and are able to control the fight a lot of that could be self-damage. But it is also necessary to cater for changing circumstances and evolving threats – and insurgency has introduced a whole new range of problems. I was in Pakistan a few months ago. The insurgents there have accepted that if they can't kill the aircraft in the air, they will get them on the ground. If they can't get them on the ground, they go after the pilots. We are now working with our Pakistani colleagues as to how to adapt their force protection procedures to counter those threats.

Every generation faces new threats and we, the RAF Regiment, have to adapt to the way in which the RAF will fight in the future. There will always be a role for the Regiment and this may well involve further expansion of its traditional functions

BOOK REVIEWS

Note that the prices given below are those quoted by the publishers. In most cases a better deal can be obtained by buying on-line.

From Jet Provost to Strikemaster by David Watkins. Grub Street; 2017. £25.00.

Although not promoted as being included in Grub Street's ongoing 'Boys' series, David Watkins' latest title amounts to a *de facto* 'JP Boys', but in spades. Compared to the others, this 224-page volume has a larger, almost square (26 x 22.5mm), format and is lavishly illustrated. Embedded within the text there are 140+ photographs, many of them in colour, of RAF Jet Provosts and sundry folk who flew them, and another 50 or so of export models and Strikemasters.

The narrative begins by tracing the evolution of the project from the T Mk 1, the relatively crude, stalky-undercarriaged adaptation of the original Provost, to the fully developed and pressurised T Mk 5. The next two chapters provide an account of the RAF's use of the aeroplane and its service with each unit is recorded in some detail. Apart from the mainstream CFS, Cranwell and Nos 1, 2, 6 and 7 FTSs, due attention is paid to all of the other operators, including the School of Refresher Flying, No 1 TWU/No 79(R) Sqn and even No 26 Sqn (who knew?). These accounts are enlivened by personal recollections – this is the 'JP Boys' element – contributed by scores of QFIs and students, including members of the many Jet Provost display teams fielded by the CFS and the FTSs. The latter are amplified by a dedicated appendix that records, for every year between 1958 and 1976, the aeroplanes flown by each team and the names of its members; there is also a section dedicated to JP pilots who competed for the Wright Jubilee Trophy. Finally, there is an appendix that provides, in satisfying detail, a 'biography' of each of the 505 aircraft taken on charge by the RAF, recording its movement from unit to unit and its eventual fate.

While of less direct interest to this Society, the book also covers the extrapolation of the JP to result in the Strikemaster and its use by a number of air forces, supplemented, in some cases, by first-hand accounts, mostly by company pilots and/or RAF officers on secondment. The individual careers of the 65 JPs and 150-odd

Strikemasters that were exported are also provided, although in some cases the detail is, quite understandably, somewhat sparse.

Errors? I spotted only one: the JP Mk 1 demonstrator in photo 13 is G-AOBU (not G-AOUS), but I do wonder about the ability of an export JP Mk 51 to carry as many as eight 500 lb bombs (caption on page 27) – that seems a very lot to me. Because there are so many personal accounts, and the experiences of individual QFIs and/or students tend not to differ greatly, these can occasionally feel a bit repetitive, but these recollections span the 'Hullavington Experiment' with the Mk 1s in 1955-57 to the withdrawal, in 1993, of the last pilot training T3As from Linton-on-Ouse and the last of the tip-tanked 'T5Bs' used to train navigators at Finningley, and a close reading of these accounts provides some insight into the way in which the RAF evolved over that period and the impact that those changes had on training.

This nicely-produced book will tell you pretty much everything you are ever likely to need to know about the JP. Highly recommended.

CGJ

Canberra Boys by Andrew Brookes. Grub Street; 2017. £20.00.

Grub Street's latest 'Boys' offering was launched at the Duxford Air Festival on 27 May – amid the sights and sounds of the first display of the season – a little over 68 years since the Canberra prototype's maiden flight. No 101 Squadron took the first examples into service (the B2 variant) in 1951, starting the replacement of Bomber Command's then front-line complement of Lincolns and Washingtons. The last flight of an in-service RAF Canberra (a PR9 of No 39 (PRU) Squadron) was on 31 July 2006. Thus, fifty-five years of service, spread across sixty or so squadrons and units that had operated one or other version of the 'Queen of the Skies'. Now, I know Jock Heron's review of a Hunter book (not in the 'Boys' series – *Journal 60*, page 120) has claimed that title for the Hunter, but perhaps we can agree to differ.

Andy Brookes has assembled a rich collection of reminiscences from a wide cross-section of RAF operators of just about all marks of the aircraft, but also including men from the US, Australian, Indian, Pakistani and Argentine Air Forces. The introductory chapters – after

a foreword by the current CDS, Air Chf Mshl Sir Stuart Peach (a PR7 navigator in the late 1970s) – cover the design and initial development, test flying (with affectionate recollections from 'Bee' Beamont), and introduction into service. Build-up was rapid – twenty-four squadrons in the UK and three in Germany by end-1954. I have to take issue with just one element of Andy's logical and comprehensive survey. He has a table (at page 22) of the 'Main Canberra Squadrons in Order of Formation.' Fine, and indeed perfectly accurate in its listing of forty-three squadrons forming from May 1951 to December 1957 (with a quartet of PR squadrons out of chronological step). But it means – sometimes because of squadron renumbering – that several perfectly reputable (and with a reasonable claim to be 'main') squadrons do not appear. Thus, the frustration of this reviewer not to see either No 14 Sqn (renumbered from 88), or No 85 Sqn (transitioning to Canberra use in April 63), in that list. Enthusiasts for the records of Nos 3 (renumbered from 59), 13, 39 Sqns and a dozen or so more, will feel the same pang of omission. They can rest assured, however, that there's plenty in the meat of the book about those particular units.

For, after a short chapter reviewing later stages of development of the basic airframe, bringing in the B6, PR7, B(I)6, B15 and 16, plus further deep modifications to produce T11/T19, T17, TT18, then the externally different B(I)8 and the radically different PR9 (different inside and out and with much increased engine power), the reader is treated to accounts of record-breaking flights – speed, distance, height – and the 'flag-wagging' round-the-world trips to promote the aircraft, plus the exploratory navigation exercises to the North Pole by the RAF Flying College's specialists.

The next thirteen chapters are the heart of the matter, and the expected content for a 'Boys' book – the personal stories of success/failure/cock-up across all the theatres of the RAF's Canberra operations: RAF Germany, MEAF, NEAF, FEAF. Suez gets good coverage (including an account of the last time an RAF crew in an RAF aircraft was shot down in air-to-air combat). There are riveting memories of nuclear weapons trials, with Canberras as radiation samplers and high-speed couriers, getting the samples back to the UK from Christmas Island. The description of the urgent mission to Belize in 1958 is a masterpiece of total recall. There is detail on all the

techniques and profiles employed by bomber and recce versions: high and low level tactical recce and strategic survey; LABS for nuclear weapon delivery; ultra-low-level for conventional rocket attack; the challenges of shallow-dive bombing at night under flares. The Far East theatre operations are detailed, starting with Operation FIREDOG against the Malayan insurgents, then the expansion of air activity as Indonesia threatened in 1964-65, with Canberra squadrons from Germany and Cyprus heading east on rotation, reinforcing the FEAF residents.

Chapter 21 focuses on RAAF operations with the aircraft, especially the four years spent in and over Vietnam by the Australians' No 2 Squadron. The next chapter is very much in the same theatre, but this time with the USAF's B-57 variants (403 of which were built under licence in the USA). The 'pucker factor' of combat operations is identified – tastefully!

Then comes an interlude where Andy Brookes exercises his author's prerogative to put in some of his own Canberra stories, from a time when, as he notes, there was still 'life in the old dog', with Nos 7, 85, 98, 100 and 360 Sqns' aircraft providing support services to the operational force. Target-towing ('pucker factor' there, make no mistake), calibration, silent target, ECM – all had their important part to play in the middle and later years of the Cold War. It allows Andy to reflect on the perennial problems of asymmetric handling of an aircraft with two widely-spaced engines. He recalls the exercise that caused problems from Day 1 – the simulated (but always stimulating) EFATO – engine failure after take-off. Thus was lost the Station Commander at Wyton, plus the other two on board a T4, as it all went wrong on 18 March 1991.

We now return to further first-hand stories from both India and Pakistan. I particularly enjoyed the IAF's grudging respect for a PAF B-57 pilot, nick-named 'Eight-Pass Charlie', attacking the IAF base at Adampur. Argentinian Falklands missions and losses fill a short section before a final *pot-pourri* of 'there I was' stories leads on to a tribute to the final operational version, the PR9 – this was the version that brought down the curtain on a show that ran and ran. Worth recalling that, as Wikipedia records: 'In 2007, the C-130 became the fifth aircraft – after the English Electric Canberra, B-52 Stratofortress, Tupolev Tu-95, and KC-135 Stratotanker – to mark 50 years of

continuous service with its original primary customer (the USAF).' The RAF's C-130 has already reached its 50 years of service and may very well match the Canberra's 55. A record that English Electric and the RAF can be proud of – well captured by Andy Brookes. Good read – do get it.

Air Cdre Phil Wilkinson

The Air Staff and the Helicopter by Chris Gibson. Blue Envoy; 2017. £11.95 plus P&P from blue.envoy.services@googlemail.com

Chris Gibson's most recent account of the RAF's acquisition of its post-war aeroplanes, *On Atlas' Shoulders*, dealt with transports (see *Journal 66*, page 136) but space constraints meant that helicopters had to be excluded. He has filled this gap with a 48-page, A4 softback written in the same style. That is to say that, aside from considering the various types that eventually saw service, it discusses some of the essential attributes of military transport helicopters and the RAF v Army arm-wrestling over which Service was best-fitted to operate them. The eventual outcome was that the Army would provide reconnaissance and fire support, while the RAF would deliver troops and equipment and evacuate casualties. The succession of support helicopters operated by the RAF are considered in turn, but, as is usual with this author's essays, a significant amount of space is devoted to the non-starters and dead ends that littered the path leading to the aeroplanes that actually worked. Thus the reader is presented with an account of the War Office's early proposals for an Air Cavalry-style 'Hover Force' which would have exploited the potential represented by the large, triple-rotor Cierva Air Horse of the late 1940s. The 'what if' content moves on to consider Fairey's rather impressive Rotodyne of the later 1950s and its more conventional heavy-lift rival, the Westland Westminster. Along the way, Gibson has unearthed, and illustrated, some pretty bizarre flying crane projects, including the enormous Blackburn SP60 (140-foot diameter six-bladed rotors with up to twelve turbojet engines) and the Blackburn B118, which resembled a bedstead, more than 100 feet long and 56 feet wide powered by ten turboprops installed within swivelling ducted fans, while Bristol Siddeley drew up schemes for an assault transport and, what amounted to, a flying 'forklift truck' both to be powered by its innovative vectored-thrust Pegasus engine.

So far as hardware is concerned the pros and cons, and the ordering, of the Whirlwind, Belvedere, Wessex and Puma are discussed chronologically. In 1962, the requirement for helicopters to carry out a variety of functions in the 1970s, for all three Services, was spelled out in ASR358. The most critical role was probably that of heavy lift and, having considered a number of candidates, an order for Chinooks was placed in 1967 only to be cancelled a year later. This procedure was recycled in 1971 but in 1978, a third order was placed and this time it was fulfilled and the writer provides some insight into the wrangling that led to that exercise in indecisiveness. The story is rounded off with an account of the short-lived, in RAF terms, Merlin.

This nicely-presented monograph is the latest in Blue Envoy's 'Project Tech Profiles', a series of similarly-sized publications that has previously considered a number of specific aspects, mostly unrealised projects, of post-war British military aviation (see, for instance, *Journal 56*, page 176 and *Journal 62*, page 166). It would seem that they sell-out quite rapidly, however, and they are fast becoming collectors' items; the asking price for some of the earlier titles is already more than £30 so, if helicopters are your thing, I would buy now, rather than trusting in Santa next year.

CGJ

Air Force Blue – The RAF in World War Two – Spearhead of Victory by Patrick Bishop. William Collins; 2017. £20.00

Patrick Bishop is the author, *inter alia*, of two well-received books, *Fighter Boys* and *Bomber Boys*, in which he presented written and oral accounts of life in the Royal Air Force at war in two very different operational environments, describing events and the emotions and attitudes of those caught up in the Battle of Britain and in the Strategic Bombing Offensive, 'as much as possible from the perspectives of the participants.' In this new book, the final work in his trilogy, he has widened the horizons to include the Service's part in all arenas of the Second World War. It does not pretend to be a comprehensive history or a chronicle of war in the air, but, in 410 pages, supported by more than 50 b/w and colour photographs and six maps, it does seek to 'colour in the RAF's distinctive identity' and to portray 'the spirit of the Air Force, its heart and soul.' Nevertheless, Patrick Bishop does, very successfully, set the spirit of the Service in its operational and

chronological context, dealing theatre by theatre and role by role with its successes and failures. The resulting work shines a revealing light on the ethos of the RAF and on the background of its servicemen and women in WW II.

Bishop's opening pages reflect on the esteem in which the Royal Air Force was held in the United States, quoting the mildly self-congratulatory chief information officer in the RAF's permanent delegation in Washington DC who suggested that 'its reputation is so high that in some quarters it is almost regarded as something apart from, and superior to, Britain.' Hyperbole or not, this view points to the fact that the Service was seen as different to the Royal Navy and the Army, its airmen 'modern, competent and democratic and reluctant to give to give those above them the automatic deference that had hitherto been expected.' The RAF in 1939 reflected its struggles for survival of the inter-war years and, most importantly, the nature of its membership drawn from strata of society very different to the older Services. The claim that the RAF offered real opportunities for social mobility may seem overblown in 2017, but in the 1930s and '40s it was, relatively, very accurate.

In a chapter with the rather clichéd title, 'Brylcreem Boys', Bishop praises the RAFVR which, he suggests, 'hastened the transformation of the Air Force from a tiny élite dominated by the comfortably off and the privately educated into a mass organisation drawn from every level of Britain's sharply stratified society. It was of fundamental importance to creating the meritocratic service it was to become and very largely remains.

Some of the language of *Air Force Blue* tends towards the journalistic and the book's reception in the media at the time of publication was focused, unfairly given its scope, on the opportunity it presented to combine prurience with a spot of Harris bashing! The indignation and relish with which media commentators seized upon the Commander-in-Chief's handling of the venereal disease crisis described by Bishop may have done no harm to sales but highlight again the hazards of armchair criticism seventy years after the event.

Despite his disclaimer, that this is not a history of war in the air, Patrick Bishop weaves his social analysis very successfully into a framework provided by the campaigns and roles of the RAF during the Second World War. Inevitably there are points of detail with

which the reader may disagree but, overall, he achieves his aim to describe the identity and ethos of the Service in a compelling way. Given the depth of his researches and his skilful use of eyewitness accounts, Patrick Bishop has not only completed his trilogy but has made an admirable contribution to understanding the very distinctive nature of the Royal Air Force, then and now.

AVM Sandy Hunter

Phantom Boys, Volume 2 by Richard Pike. Grub Street; 2017. £20.00.

Although the 'Boys' series has been on the streets for some years, I have to confess that *Phantom Boys, Volume* 2 is the first in the series that I have read. This book, I believe unlike some others in the series, contains stories by American pilots and no doubt the author and publishers are aiming at a wider market. The Prologue is written by perhaps the most famous American F-4 Phantom pilot of them all, the late Colonel Robin Olds of Vietnam War fame. As he states, the McDonnell Douglas designed aeroplane was hardly a thing of beauty, but came to life in the air, and to be loved by so many.

The stories, one or two in each Chapter, are many and varied although with some common themes; for example, the great kick one got as the reheat was engaged, whether on take-off or in the air. All speak with affection of flying one of the greatest ever fighter aircraft of which over 5,000 were built. As the tales bring out, the Phantom was remarkable for the variety of roles of which it was capable of undertaking; there are stories from Vietnam, flying from an aircraft carrier, in Germany and in the Falkland Islands. Such a large and complicated aeroplane with, for example, high speed air blown over the flaps in order to keep the speed to a minimum to fly safely on and off an aircraft carrier, did mean that things did sometimes go wrong. The book brings out well how a small problem in the air could sometimes develop into something much more serious. Solving matters required skill, crew co-operation, and imagination to bring the aircraft safely back to earth. As a former Phantom pilot myself, I was a little surprised that some of the aircraft's unusual flight control and handling characteristics are not at least referred to; maybe this is because it was routine to those who flew it, and accepted as normal by those privileged to fly such an extraordinary machine. Another story is

told by a lady who did not fly the Phantom but accepted a ride in the back seat; this was done on an infrequent basis as and when other flying allowed. Like her, for nearly all it was a ride of their lives and a simply unforgettable experience.

I enjoyed reading these stories, even though some vary a little in the quality of their writing, but anyone with an interest in aviation will find them revealing and absorbing. There is much more to tell about this legendary aeroplane and I look forward to *Phantom Boys 3*.

Air Mshl Sir Ian Macfadyen

The Royal Air Force in American Skies by Tom Killebrew. University of North Texas Press; 2015. £21.67 (from Amazon).

Subtitled *The Seven British Flight Schools in the United States during World War II* this 443-page hardback completes, what amounts to, an authoritative American-authored trilogy covering the wartime training of British aircrew in the USA.[1] Running in parallel to, and contemporary with (all three began training in June/July 1941), the better-known Arnold and Towers Schemes, the British Flying Training Schools (BFTS) were pre-dated by three commercial 'Refresher Schools'. These trained US citizens recruited by the Canadian-sponsored Clayton Knight Committee to fly with the RCAF and/or RAF – an undertaking which required some innovative legal interpretation to circumvent pre-Pearl Harbor US neutrality legislation. Despite the 'pre-war' political sensitivity, the Lend-Lease Act of March 1941 permitted the British to engage six civilian contractors to run flying schools that would train British students in the USA with the enthusiastic endorsement and active support of the American authorities. By August 1945, when the enterprise terminated, the BFTSs had trained 6,602 pilots for the RAF and another 551 for the USAAF.

The author has drawn extensively from primary sources on both sides of the Atlantic, including policy documents and correspondence files held by The National Archives at Kew and interviews with former staff and students of the schools, plus the research material,

[1] The other programmes were covered in similar detail in *The Arnold Scheme* by Gilbert S Guinn (Spellmount; 2007) and *British Naval Aviation in World War II: The US Navy and Anglo-American Relations* by Gilbert S Guinn and G H Bennett (Tauris; London, 2007).

including an extensive collection of responses to questionnaires completed by ex-participants, accumulated by Dr Gilbert Guinn. The result is a very comprehensive account of the way in which the system evolved. To begin with there was a great deal of improvisation involving the use of existing aerodromes and temporary accommodation while locations were selected for the bespoke training airfields with their newly constructed barracks, instructional facilities, hangars and the like.

The system initially followed a USAAF-style three-stage (primary/basic/advanced) sequence with little more than token RAF oversight – one squadron leader to a pair of schools. Over time, however, British influence increased markedly. At the end of 1942 the Vultee BT-13s were withdrawn, leaving the BFTSs operating a UK-style two-stage primary/advanced sequence and the RAF presence gradually grew to a staff of twelve at each school.

With top cover provided by Air Mshl Arthur Harris, who had just been appointed to command the British Air Commission, the RAF Delegation in Washington (RAFDEL) was set up in June 1941 with Gp Capt David Carnegie as the first Director of Training. His responsibilities embraced all aspects of the support, administration and supervision of all three arrangements in the USA, including liaison with the concerned American authorities. Other notable personalities who worked with RAFDEL included Wg Cdr (later AVM) Henry Hogan, Wg Cdr (later AVM) Wilf Oulton and Sqn Ldr (later Air Chf Mshl Sir) Tom Prickett.

In tracing the fluctuating fortunes of each school, the narrative considers its evolving relationship with its respective local authority, and of its commercial proprietors with their RAF and USAAF clients. All of this it does very comprehensively, with ample endnotes, but the overriding impression that the reader is left with is of the warmth of the welcome and generosity of the hospitality that the local people extended towards the young British trainees who first began arriving in their midst in mid-1941, a welcome that showed no signs of flagging as each new cohort arrived over the next four years. On a more sober note, the book ends with an annex listing the fatalities that occurred at the various schools.

The author has included several excursions consisting of numerous brief vignettes providing insights into the personal experience of

individuals who served on the staff of various schools, of students under training and/or their subsequent careers. The latter range from men who were shot down on their first operational sortie, like Sgt Douglas Wilkinson, via Gp Capt Johnny Baldwin, who became the top-scoring pilot on Typhoons, to Clifford Ashley who racked-up 20,000 hours of post-war airline flying and Air Chf Mshl Sir John Gingell, who became Black Rod. Some readers may regard these interludes as padding, if so one can simply skip them, but this reviewer found them fascinating.

There have been previous essays on the BFTSs but none as comprehensive as this and it is unlikely to be surpassed in the future. Recommended.

CGJ

The British Pacific Fleet (The Royal Navy's Most Powerful Strike Force) by David Hobbs MBE. Pen & Sword, 2007. £13.50**.**

Originally published as a £35 hardback in 2011, used copies of that edition now retail at prices beginning at £50 and running on into the £100s. Fortunately, this hefty 480-page book has just become available again as a much more affordable softback. That said, one might reasonably ask why a book, in which the Royal Air Force doesn't even feature in the index, should be the subject of a review in this Society's journal. The simple answers are: because it records, in exceptional detail, a little-known feature of the British Commonwealth's maritime war effort and, furthermore, describes a major application of air power, exploiting the mobility afforded by the aircraft carrier and the utility and flexibility of both the 'sea train' and the on-shore support organisation, to their fullest extent.

The war in Burma is often said to have been waged by 'the forgotten' 14th Army and if this was the case, then the epithet, 'the forgotten navy', might equally be applied to the British Pacific Fleet. It had its origins in the East Indies Fleet and the political and military decisions taken in an attempt to get the Royal Navy into the Pacific and to support the more powerful, and better organised and equipped, United States Navy.

Hobbs covers the preamble to the creation of this 'new' fleet, the appointment of its CinC and how, from humble beginnings, it became a valued and significant contributor to the final victory over Japan. A

major plus is that this is not merely an account of the operations conducted by the fleet; it also covers the development of every aspect of its supporting organisations, from mobile maintenance bases, via the use of small carriers to replenish losses suffered by the squadrons embarked in the fast carriers, to the fleet train. It then goes on to record how the USN eventually came to value the British contribution to the campaign in the Pacific, to enthusiastically embrace that contribution and to give unstinting assistance to the British.

The author is open about the limitations of some of the British aircraft and whilst the Seafire seems to have eventually found a niche, the Barracuda was simply not up to the task, with the US Corsair and Avenger proving to be much better. On the other hand, the armoured decks of the British fast carriers were a distinct advantage in mitigating the damage caused by Kamikaze attacks, permitting the RN's ships to remain on station when their US counterparts were compelled to withdraw for damage repair.

I found an irritation in the repetition of some information; for example, the rules regarding the disposal of Lend-Lease aircraft at the end of hostilities, which required their return, disposal or purchase. It suggested to me that the author may have written the book in a modular form but had not then had a review of the whole to remove oft-repeated information. That said the book benefits greatly from a comprehensive series of appendices, over 20 pages of notes related to references within the text and an extensive bibliography. It is also extensively illustrated throughout with monochrome photographs, all embedded within the text, which this reviewer much prefers to photographic inserts.

The reader will need to have their wits about them, however, because much use is made of abbreviations and, whilst these are all explained initially, every profession has its own 'language' and the Royal Navy has had hundreds of years to develop theirs!

I bought this book originally as a reference work, to be dipped into from time to time but, after several short 'browsing sessions', I soon found that I wanted to take in the whole story and so settled down to 'eat the entire elephant'. I am glad I did, because Hobbs has produced a tome which finally does justice to the British Pacific Fleet, that contributed so much to the final battles of the war.

I suspect that most folk who acquire this book will, as I originally

intended, have invested in it as a work of reference but, should you find time weighing heavily, you could do much worse than read this fascinating account – cover to cover.

Wg Cdr Colin Cummings

Wings Over Mesopotamia by Mark Lax, Mike O'Connor and Ray Vann. Cross and Cockade International; 2017. £25.00.

Sub-titled, *Air War in Iraq 1914-1918*, *Wings Over Mesopotamia* is C&CI's latest stand-alone publication produced, in this case, in association with its antipodean equivalent, the Australian Society of World War One Aviation Historians. This link arises from the fact that the bulk of the first aviation contingent to reach the theatre, in May 1915, was the 'Australian Half Flight' which operated a handful of Farmans provided by India. In September, they were joined by an RNAS detachment equipped with Short Seaplanes, which soon had their floats swapped for wheels (although later deliveries were operated from the Tigris), followed at the end of December by an RFC flight from Egypt. By this time, Maj Gen Townshend's attempt to take Baghdad had failed and his Army was besieged in Kut-al-Amara where the various air units did their best to sustain the troops by dropping supplies. This endeavour was bound to fail, however, as the requirement exceeded the capacity of their combined resources, and was complicated by the arrival of air opposition in the shape of aeroplanes flown by both Turks and Germans.

Thereafter the, initially somewhat *ad hoc*, British air element gradually grew so that by the end of 1918 it comprised three full RAF squadrons, Nos 30, 63 and 72 Sqns, with detachments of the latter eventually deployed as far forward as Baku on the Caspian Sea. That said, being the furthest front from London, the aeroplanes provided tended to be obsolescent (the BE2e and SPAD S.VII were still being flown operationally at the end of the war) or types that were deemed unsuitable for use in Europe, notably the Bristol M.1. More modern equipment, like the RE8, did not appear until the autumn of 1917 and it was the spring of 1918 before Mespot received any SE5as. Nevertheless, the RFC/RAF discharged all of the classic aerial functions including visual and photographic reconnaissance, mapping, bombing and air fighting, and it did them all under the most difficult field conditions with groundcrew and aircrew alike having to cope with the

debilitating effects of heat, dust and disease.

All of this is chronicled in twenty-five short, easily-digested chapters within a 140-page A4 softback containing a quite remarkable collection of 440 contemporary photographs of aeroplanes, locations and personnel, all presented on gloss paper to achieve the best possible resolution. The narrative is supported by several detailed appendices, one of which lists all of the officers who served with each of the air units in-theatre, including HQ 31 Wg and the Air Park, not just the aviators. Another provides brief biographies of 102 individual officers, most of them supported by a 'mug shot', and a third identifies, by serial number, all of the aeroplanes known to have been delivered to Mespot.

Another *tour de force* for C&CI – and worth the price for the unique collection of pictures alone.

CGJ

Logistics In The Falklands War by Kenneth L Privratsky. Pen & Sword; 2016. £25.00.

Inevitably, the conflict in the Falkland Islands, the 35th anniversary of which was being commemorated as this review was being written, spawned a veritable library of accounts, of variable quality and objectivity.

One aspect of the campaign, thus far neglected for detailed scrutiny, has been the logistic effort required to support it. However, this book, sub titled *A Case Study in Expeditionary Warfare*, focuses specifically on the conduct of the logistics task but – surprisingly for a British military that prides itself on its quality and professionalism – it took a US Army general to undertake this analysis.

If one were to ask twelve people for their definition of logistics it would probably bring forth a dozen different responses, but for the purposes of this account, it might be said to be 'support', and in its many guises.

The author, who has wide experience in the US Army, dating back to the Vietnam conflict, has made a detailed study of the events in the South Atlantic in 1982 and has written and presented extensively on the conduct of the campaign. His account begins with the history and politics that led to the hostilities and then works steadily forward to examine the many issues entailed in deploying a military force 8,000

miles from its firm base. Privratsky pulls no punches as he examines the internal tensions which developed between the commanders and the resultant frustrations. He looks at the consequences of, for example, the lack of support for the attack on Goose Green and the insidious impact of political interference from afar.

One of the best reasons for picking up this book is that it places the logistics issues on centre stage when describing the operational planning and delivery. From that viewpoint alone the book is worth reading, as it reminds us of the events of 1982, the chronology of which we might now have forgotten, and of how close-run the outcome was.

The book is also very thought provoking: since Op CORPORATE, the British have participated in two conflicts in the Middle East – several more if one includes the 'Arab Spring' events. There have been more excursions in the Balkans than I can actually recall and we are currently engaged in Syria and Iraq. In contrast to this prolonged operational activity, there have been exceptional levels of downward pressure on the defence budget, as witness SDSR 2010, with our logistics footprint and operational capability significantly reduced by various initiatives, such a 'hollowing out', where the primary concern has been to reduce expenditure – not to improve effectiveness. It would be interesting to know what the armed forces might be able to do, and what level of sustainability still exists, within Defence today. I suspect we might be seriously alarmed to learn how feeble we have become.

This 271-page hardback, with its 16 pages of monochrome photographs, and some rather indifferent sketch maps, enjoys a Forward by Maj Gen Julian Thompson and includes ample notes and a bibliography. Privratsky's account should become required reading for military students early in their careers, for I fear that all too often there remains a lack of focus on the twin subjects of support and sustainability, yet these are the two planks which must underpin any successful operation.

Wg Cdr Colin Cummings

Holding to the Heavens by Paul Hickley. Aviation History Press; 2016. £20.00.

The content of this new history of No 60 Sqn is curiously wedge-

shaped. Prior to the 1960s it is relatively thin, but thereafter it becomes increasingly detailed. It is also somewhat unconventional in that it lacks any of the annexes that one normally expects to find in the history of an RAF unit, so there is no list of COs, no record of bases, no roll of honour, nothing on decorations won, no details of aeroplanes flown – nothing. Photographic content is uninspiring too, including: computer-generated images of a Morane, a Nieuport and an SE5a, rather than photographs of actual aeroplanes; a Thunderbolt in USAAF, rather than RAF, markings; sundry generic shots of aeroplanes (Hurricane, Spitfire) in place of examples actually in service with the squadron, and others of types that the squadron never even operated (Anson, Mosquito); and the picture of a Devon is captioned as a Heron. Some basic 'air force lore' is also misrepresented, or misunderstood. For example, roles were not included within unit designations when the squadron reformed in 1920 – No 60 Sqn did not actually acquire its (B) suffix until 1924; there were no commissioned observers in 1939; the Burma Star does not 'take precedence over all' WW II campaign medals – it is sixth; the first AAR-assisted movement of Javelins from the UK to Singapore was Operation (not Exercise) DYKE; there is some confusion over the difference between 2ndTAF and 2ATAF; and the old 'Thirty Year Rule', was reduced to twenty in 2010 (*although this seems to have made little impression on the MOD. Ed*).

So what of the narrative? The account of the first 50 years of the unit's existence relies heavily on the book privately published in Singapore in 1966 to mark the squadron's fiftieth birthday. Due acknowledgment is made to the archive built up prior to that and since, primarily by the late Joe Warne, but, rather than exploiting this source to amplify the original account, the text has been substantially pruned and much of what remains has been reproduced verbatim. That said, some passages, presented as quotes, are subtly different, creating some doubt as to which version is correct. Thereafter, the last 200 pages cover the second half-century, of relative peace, compared to the previous 150 that had embraced two World Wars and about 30 years of active colonial policing – it's that wedge-shape. What is a little odd about the latter part of the book is that it tends to wander off at tangents. For instance, the arrival of AVM Christopher Foxley-Norris as AOC 224 Gp in 1964 is recorded with a summary of his

career taking the best part of two pages, whereas neither his predecessor nor his successor, AVMs Frank Headlam and Brian Eaton, get even a mention. Similarly, there are occasional detours that explore international political developments in rather more detail than is probably necessary in the context of a unit history.

The book's strength lies in its coverage of the years since 1969 and, in particular, the 23 years it spent in Germany as a communications squadron, which occupies 110 pages. That is approaching a third of the entire book and the nature of the narrative makes it feel like a quite different one. The author flew a tour as a navigator with the squadron in the late 1980s and, while his several personal recollections do add some colour, they also tend to distort the overall balance – and balance is an issue here. One of 'Sixty's' roles was to use its Pembrokes to implement Operation HALLMARK which involved, while transiting the air corridors between Berlin and 'the Zone', taking surreptitious photographs of military installations and/or activity in East Germany. A classified activity at the time, of course, the author has been able to describe the equipment used and reveal how these sorties were conducted, and some of the problems that were encountered. In doing so, however, he has also stretched his remit to provide a summary of this sort of activity going right back to 1945. This is all good stuff, of course, but prior to 1969 it had nothing to do with No 60 Sqn. One of the principles of war is 'Selection and Maintenance of the Aim' and this could apply equally to the writers of unit histories.

The final 40 pages restore the perspective somewhat and cover the squadron's five-years operating the Wessex in the support helicopter role and its current existence as the RAF element of the Defence Helicopter Flying School at Shawbury. Even here, however, the tangential factor arises with three whole pages devoted to night vison goggles while the fact that the unit is now designated No 60(R) Sqn is not even acknowledged, let alone what its reserve status implies.

This is, undeniably, a history of No 60 Sqn which updates the earlier version by adding another 50 years, although the absence of the customary annexes is disappointing. Nevertheless, that aside, it serves its purpose well enough, but I found it an uneven read, because of the variation in the nature of the content at different periods and the style of the associated story-telling. The author has attempted to provide

two books in one, a unit history and an account of Operation HALLMARK and its predecessors, and it doesn't quite work.
CGJ

The Women Who Flew For Hitler. The True Story of Hitler's Valkyries by Clare Mulley. Macmillan; 2017. £20.00

In Hitler's Germany two women emerged who displayed quite exceptional talents as test pilots. To say, as the book's title implies, that they both flew for Hitler is imprecise. One of them, Hanna Reitsch, with a solid Aryan background, most certainly did. She was not a member of the Nazi Party but idolised Hitler and all that he stood for. The other, Melitta Schiller, later The Countess von Stauffenberg, was a different kettle of fish. She had Jewish blood in her ancestry and found her inspiration in her deep love for her country. Her family had some connections with the aristocratic von Stauffenbergs, one of whose members, Claus, placed the bomb which failed to kill Hitler in the July 1944 Bomb Plot. Melitta entered the Prussian aristocracy as the Countess von Stauffenberg after marriage to Claus's brother Alexander.

Although they were both members of a particular professional elite it seems that Hanna and Melitta did not have much to do with each other and the text suggests that some positive dislikes existed between them. There were in fact distinctive differences between them. In 1922 Melitta had become a student at the Munich Technische Hochschule where she specialised in aeronautical engineering. In 1926 she obtained a post at DVL, the German Research Institute for Aeronautics where her ability to handle engineering matters were required. In 1929 she enrolled at the Berlin Staaken flying school and went on to qualify as a pilot. Over the next few years she acquired skills in flying a wide range of aircraft types and sufficient technical experience to start conducting her own test flights. Eventually she obtained her PhD and became technical director of a Berlin based experimental centre for Special Flight Equipment. Hanna Reitsch was not in the same league. She studied medicine at Berlin University, later moving to Keil, but there is no evidence in the text of her having graduated in medicine. Her route to flying lay through a lot of experience in gliding but she also received flying training as Melitta had done at the Staaken airfield

flying school. Both women were exceptionally brave and skilful test pilots and the text is densely illustrated by examples of the courage they showed in testing, almost to destruction in some cases, a wide variety of gliders and powered aircraft, up to and including the Me163(in gliding mode) and the Me262. The author has done a very thorough job in detailing these activities and her text is backed by a bibliography and notes from a good range of primary and secondary sources.

After the failure of the 1944 Plot Melitta endured a period of imprisonment resulting from her association with members of the Stauffenberg family but there was no suggestion that she had committed any kind of treasonable act. On her release she was able to resume her test flying and was killed when flying, in an attempt to see her husband who was under house arrest, by what I think must have been a P-51 of the USAAF. An honourable death under the guns of one of the finest fighter aircraft types in WW2.

Hanna survived the war including the hair-raising efforts she made in attempts to extract Hitler from his Berlin Bunker as the Russians bore down upon the city. An account of those activities has been given by Hugh Trevor Roper in his book The Last Days of Hitler. When it became clear that Hitler would not leave the Bunker her highly strung nature and state is neatly summed up in Trevor Roper's comment that, "She left the Bunker as she had entered it, in a profusion of tears, rhetoric and abstract nouns." There was no love lost between Hanna and Trevor Roper but he had not conducted her interrogation after her capture. That was carried out by American Intelligence people and he was able to read the detailed accounts of their findings. She remained absolutely unshaken in her Nazi beliefs and was a holocaust denier. She went to India , where she flew for Nehru, and to Africa where she was associated with Nkrumah. In 1997 she died back in Germany peacefully but in the knowledge that all she had valued had been swept away in defeat.

I think this is a good, well written, book based on sound sources which gives a very interesting account of the two women. It shows us the triumphs they achieved in the air and also shows us very clearly the contrast between them as human beings.

Dr Tony Mansell

Instruments of Darkness by Alfred Price. Frontline Books; 2017. £19.99.

When this book first appeared in 1967 it was the first attempt to provide a succinct and easily assimilated account of, as its subtitle proclaims, *The History of Electronic Warfare 1939-1945*. Fifty years later it has become available again, this time as a 272-page softback. The fact that this is the fourth time that it has been republished is testament to its quality.

This is a reprint of the revised edition which first appeared in 2005. Compared to the original it was extensively re-written and introduced a good deal of new material related to the American contribution, in both the European and Pacific theatres, the latter including an appreciation of the electronic capabilities of wartime Japan. There are other, later, books that deal with, to use the contemporary term, radio countermeasures (RCM), some of which delve into greater detail, but Price adopted a 'keep it simple' approach. While, very familiar with the more esoteric aspects of the technology himself, of course (he was an AEO), this book was clearly written for the layman. Thus, beyond indicating the frequency band in which a particular piece of kit operated, the narrative is very readable and the 'wiggly amps' content will not tax the attention span of the typical aviator.

So, if you want a concise, authoritative guide to the purpose of devices such as Tinsel, Drumstick, Mandrel, Piperack, Serrate, Boozer and Carpet or *Seetakt, Mammut, Klein Heidelberg* and *Naxos*, to name but a few, this book has been the standard work of reference for half-a-century – and it still works. Furthermore, the information on all of these pieces of kit is set within an historical narrative so one gains a clear impression of how and why each one was developed and introduced, the impact that it had and how it was eventually trumped by the opposition, leading to another device to permit the initiative to be regained. The text addresses all aspects of aviation-based electronic warfare, including surface-based early warning and fighter control radars, and airborne ground-mapping and air interception radars. It discusses the counters devised to hinder the operation of all of these and/or to exploit their vulnerabilities, ranging from the use of chaff, via various forms of spoofing, to crude noise jamming. All of this, and more, is explained in easily flowing prose.

Following the original appearance of this book, the Association of

Old Crows commissioned its author to write the definitive three-volume *History of US Electronic Warfare* and the fact that 'the Ravens' had asked a Brit to tell their story underlines his unmatched expertise in the field. Sadly, Alfred Price, who became a prolific writer on aviation history with over 90 titles to his credit, passed away in January 2017, more or less coincident with the reappearance of his ground-breaking *Instruments of Darkness*, which is somehow appropriate as many may consider it to have been his most significant achievement.

CGJ

V-Force Boys by Tony Blackman and Anthony Wright. Grub Street, 2017. £20.

V-Force Boys is the fourth in a series which encompasses *Valiant Boys*, *Vulcan Boys* and *Victor Boys***.** You might suspect that *V-Force Boys* serves as a repository for all the leftovers which didn't make the first three volumes. You would be wrong. *V-Force Boys* has flushed out some of the great V-Force characters who rarely duplicate what has gone before. It is nice to find a V-Force book which doesn't bang on about bombing the Falklands, an operation which, for all its significance, was completely at variance with the deterrent *raison d'etre* of the day-to-day V-Force

Although there are some well-trodden paths in this book, there is far more which is fresh and new. For example, John Muston recalls dropping the last Christmas Island H-bomb while extrovert Valiant pilot Tony Yule is very good on officers mess and V-Force social life. There are some great historical vignettes in this book, many told with panache and verve. I have to flag up that I served with many of the 'characters' who reminisce. Nav Plotter Jim Vinales was one, and his recollection of the loss of Vulcan XM610 with Bob Alcock's crew on board is very well written. I certainly didn't know that rear crew parachutes were fitted with multi-coloured panels for both detection in peace and camouflage in combat. I hope the Soviets appreciated the difference.

Many good stories add up to great history. Nav radar Anthony Wright is very good on oft-neglected aspects of V-Force history such as the infamous 1 Group Dining-In Night held at Waddington. Although the guest of honour was Sir Harry Broadhurst, Anthony's

memory plays him false when he describes the ACM as CinC Bomber Command – Broady had retired from the RAF six years earlier. I mention this, not in the interests of pedantry but because it is the only error I have found in an otherwise well-edited book. I also enjoyed Monty Montgomery's overview of the art of visual low-level bombing from the pilots' perspective. While 'the offset brigade in the back looked after the ranging of the bombing run', Monty highlights the importance of the refuelling probe which was not there for in-flight refuelling (we never did any of that on my three V-force tours) but rather to serve as a pilots' visual bombing aid. The French SFOM bombsight just gathered dust.

Notwithstanding the three earlier V-bomber 'Boys' volumes, there is quite of bit of new stuff here but perhaps more importantly, it is more coherently and logically organised. There are also great recollections from larger-than-life characters such as Spike Milligan. Don't be put off by his chapter title 'Navigating all Three V-Bombers' – this is not a soporific chronicle of astro techniques or Doppler theory. Spike never knowingly understates anything and his chronicle of ripping yarns and wizard wheezes are worth the price of the book alone.

I could go on about the chapter on early Victor 1/1A bombers which are often neglected. And then there is the incredible story of HMS *Cardiff* firing two Sea Dart missiles at two Victor K2 tankers returning to Ascension Island during the Falklands conflict. No damage was caused and it is hard to credit this friendly fire story, not least because hitting a sedate Victor tanker with a Sea Dart should have been like hitting a barn door with a double bass. As Admiral Beatty might have said, there must have been something wrong with our bloody missiles that day. Read about it here and make up your own mind.

Overall, this is a very good book which owes much to the fact that it has largely been put together by former Nav Radar Anthony Wright. Anthony is a dyed in the wool V-force operator who knows the people and events that matter, and it shows. If you have the other three volumes in the series I recommend you still buy this one. You can only afford one, buy this.

Strongly recommended

Wg Cdr Andrew Brookes

Hawker P1127, Kestrel and Harrier: Developing the World's First Jet V/STOL Combat Aircraft. The History Press; 2017. £20.00.

This book from The History Press, regrettably not in a hardback format, is another of Tony Buttler's detailed descriptions of the development of an iconic British aircraft, this time the P1127 family. He has conducted his research from primary sources held by The National Archives at Kew, the Rolls-Royce Heritage Trust in Bristol and the Hawker archives at Brooklands. Other important observations come from the late Hugh Merewether's excellent book *P1127, Prelude to the Harrier,* which analysed every sortie flown by the six prototypes and the nine Kestrels of the Tripartite Evaluation Squadron. The foreword to Buttler's book is written by John Farley, an expert in matters VSTOL, who acknowledges the immense detail contained in this publication and describes it as 'a book that needed writing' so there is no better endorsement. He goes on to say that the book is dominated by numbers, and even more numbers, where the author has noted from flight test reports that every flight in the very early days needed considerable pre-flight understanding of the aircraft weight, engine limitations, modification standard, outside air temperature and atmospheric pressure such were the tight margins for achieving success in the air.

The author describes the early exchanges between Hawker's Sir Sydney Camm and Bristol's Sir Stanley Hooker at a time of uncertainty within the British aviation industry, following the ill-judged 1957 Defence Review. Both major companies had been the victims of project cancellations and these two visionaries used the opportunity to expand the debate on jet vertical lift, beyond the multiple lift engines concept which was already in development at Shorts and Rolls-Royce with the SC1. Military perception of the 1950s saw a requirement for an aircraft which could operate in the forward areas and deliver tactical nuclear weapons, without the need for runways and the associated airfield infrastructure in order to survive, which led to the aspiration for a vertical take-off capability. The Hawker/Bristol initiative gave the opportunity to both companies to retain imaginative engineers by developing an advanced engineering project to investigate such a capability.

The Hawker archive, with Ralph Hooper one of the surviving pioneers as an active supporter, provided the core of Tony Buttler's

research. The ability to carry a small nuclear weapon was fundamental to the original proposals and was classified hence the use of the term ‘target marker’ – an interesting euphemism for a tactical nuclear weapon. Several different configurations were studied at Kingston and Bristol and many of these imaginative schemes are described in this hugely informative book, beginning with Michel Wibault’s concept for a ‘Gyropter’, a tubby design which was promoted by the Frenchman in the mid-1950s as a combat aircraft which could carry a nuclear weapon. It had rotatable exhaust nozzles to allow thrust to be selected from the horizontal to the vertical, allowing the aircraft to hover. Rejected by his own government, he approached British industry and, although the unusual propulsion system of the Gyropter was deemed to be impractical, the author describes how Gordon Lewis at Bristol and Ralph Hooper at Hawker re-engineered the concept to create a vectored thrust turbofan. This proposal used components from the lightweight Orpheus and the big Olympus to create the Bristol BE53 turbofan which emerged as the unique Pegasus, the heart of the P1127 family. As the thrust grew so too did the P1127’s performance until the Pegasus entered service in the Harrier in 1969 with almost double the thrust of the first run on the test bed ten years earlier.

Using drawings and photographs from the extensive Hawker archives and related engine material from the Rolls-Royce Heritage Trust he has gone into great detail quoting from flight test reports. His lack of familiarity with cockpit matters is evident in his interpretation of some of the test pilots’ reports where quoted nozzle angles and transition techniques to and from the hover are misleading. However he has documented the step by step process of developing an operational combat aircraft from the primitive, but imaginative, hovering machine which was the P1127, which the late Bill Bedford took on its first tentative lurch into the air on 21 October 1960. Buttler has resisted the temptation to venture into the operational use of the Harrier, a subject covered widely in many other publications, although he does describe some of the principal lessons which emerged from the Kestrel evaluation squadron trial; lessons which were to form the basis for the future employment of its successors as a vital offensive air support asset.

This is not a book for the average plane spotter, neither is it a casual read at bedtime, rather it is a serious and comprehensive review

of an iconic British aircraft and its early development which laid the foundation for its subsequent operational deployment. Despite occasional repetition and a few minor technical inaccuracies, Tony Buttler is to be congratulated for producing this authoritative source for the aviation historian where the wealth of written and photographic detail has, to the best of my knowledge, never been gathered into a single volume. As a long time Harrier operator, from a long time ago, I found many new twists to the history of the 'Bona Jet' and I strongly recommend it also as an informative read for anyone who had professional or even sentimental links to the Harrier. With a cover price of £20, it is very good value.

Gp Capt Jock Heron

Under Their Own Flag by Owen Clark. Fighting High; 2016. £29.95.

The unfolding centenary of the war of 1914-18 has seen the welcome publication of a succession of new histories of RFC/RNAS/RAF squadrons. This one, as its sub-title proclaims, is *A History of 47 Squadron 1916-1946*. Unfortunately, this reviewer could find no indication that a second volume is in preparation and ending the story as long ago as 1946 really is something of a disappointment and one hopes that the void is to be filled with an account of the squadron's subsequent exploits in the transport game. Inevitably, lower key than its earlier roles, of course, but no less important, over the next seventy years No 47 Sqn participated in many significant operations, most recently flying the first sorties of the current anti-ISIS campaign, Operation SHADER.

Nevertheless, despite covering only the first thirty years, this is an excellent example of a unit history. It is a nicely presented, 160-page A4(ish) hardback printed on coated paper to reproduce the 90+ photographs with the greatest possible fidelity, bearing in mind, as ever, the quality of some of the originals. The selection of photographs of people, places and aeroplanes is excellent, although a shot of a camouflaged Mosquito on page 138, captioned as belonging to No 47 Sqn, is actually of one of the handful of FB VIs flown by No 27 Sqn on a trial basis in early 1944. There is an appendix providing the dates that various aircraft were operated, including eight profiles in colour of the main types. Another provides details of the squadron's movements and a third is a Roll of Honour. On the downside, because

the squadron frequently operated well off the beaten track, many of the place names that crop up in the text will be unfamiliar and some readers may be frustrated by the absence of any maps. There are several misspellings in the main narrative which would/should have been picked-up by an independent proof reader, some involving numbers, No 31 Sqn, for example, being rendered as No 21, and No 38 Sqn as No 28.

Beyond these occasional anomalies, however, the story reads well enough and No 47 Sqn's tale is a particularly interesting one. Having spent 1916-18 in Greece (Salonika), in 1919 it moved to South Russia to support the White Forces in the civil war. Wishing to distance the UK from this commitment, the squadron had been nominally disbanded before the end of the year, although it actually continued to function on a 'volunteer' basis and it was March 1920 before the last RAF personnel were withdrawn. Promptly reformed in Egypt in the bomber role, in 1927 the squadron redeployed to the Sudan which became its stamping ground for the next fifteen years, culminating in its participation in the East African campaign. Moving back to North Africa in 1942, No 47 Sqn switched to maritime strike mounted on Beauforts, later Beaufighters. Having more or less run out of targets by early 1944, it moved to India to provide SEAC with a counter to the possibility of a Japanese fleet making a foray into the Bay of Bengal. This risk having declined, the squadron switched to the light bomber role and, after an initial false start, in early-1945 it was re-equipped with Mosquitos which it operated successfully in Burma until VJ-Day.

While the intensity of operations varied from time to time, the author provides some interesting statistics that illustrate the wastage rates that could occur when fully committed to action. In East Africa, for example, in eighteen months, No 47 Sqn experienced the 'destruction from all causes of approximately 48 Wellesleys' and during its involvement in a specific campaign in the Aegean in the autumn of 1943 (Leros), it was virtually wiped out, having lost 14 Beaufighters and 15 aircrew KIA in just three-weeks.

Recommended, although it would have been even better if it had included the post-war era.

CGJ

Fast Jets and Other Beasts by Ian Hall. Grub Street; 2017. £20.00.

In a Royal Air Force flying career spanning thirty-two years Group Captain Ian Hall completed no less than seven flying tours before becoming an airline captain and enjoying a further twelve years in the cockpit – or on the flight deck. His military flying included two Hunter tours, two Jaguar and one each on Tornado and on exchange with the Royal Norwegian Air Force, flying the F-5A. His extensive experience as an operator is happily complemented by a clear and entertaining writing style in which a whiff of crewroom authenticity is often to be found. Occasional understated cynicism does his 208-page book, which is profusely illustrated with more than 80 b/w & colour photographs and cartoons, no harm at all. *Fast Jets and Other Beasts* meanders engagingly and amusingly through his two careers, painting a vivid picture of his experiences at every stage. His passion for flying and for the Service is unmistakable, but for the latter, not always uncritical.

Ian Hall's view of RAF Germany in general and RAF Brüggen in particular, is well based on his two tours there flying the Jaguar and as OC 31 Squadron on Tornado. He writes compellingly of what was achieved there by way of operational excellence – and of the legendary J R Walker who was central to success in the early Jaguar days and who himself writes a chapter of this book. Those of us who had experience of that officer talking 'slowly and softly', in menacing tones, will quickly recognise the accuracy of the description and its impact on the recipient! Perhaps understandably, he alone of Brüggen's Station Commanders features in Ian Hall's beautifully written requiem for the Station and for RAFG.

There are not a few gems buried away in the pages of this book, taking the occasional swipe at familiar targets. The 'Health and Safety police', the 'dog's dinner' of RAF snow clearance plans presided over by hapless OCs Ops Wings, the alleged propensity of QFIs to 'confuse the issue' – all these are fair game and good sport. What may for some readers be more contentious is Ian Hall's gentle verdict on the influence of the Hunter generations in training pilots for Lightning, Buccaneer, Phantom, Jaguar and Tornado. He expresses doubt that Chivenor (where he was both student and staff member) and the other Tactical Weapons Unit were appropriately staffed, largely by Hunter *Mafiosi*, to prepare students for more modern types and systems, later

regarding the Hawk as they did, as simply a smaller and more economical Hunter. That view might be echoed by those, like myself, with experience of the elders in other, arguably less demanding roles.

The scope and interest of this book are considerable as the author rambles loosely around the framework of his two flying careers. He offers a mixture of analysis, well-reasoned comment and entertainment and he does not neglect to remind the reader that he is the author of two other books in the '*Boys*' series. On the evidence of this volume, I will now make haste to buy both.

AVM Sandy Hunter

The Desert Air Force in World War II by Ken Delve. Pen & Sword; 2017. £25.00.

The impact of air power on the campaigns in North Africa is a topic that has already been examined in print several times (most recently, and in considerable depth, by the team led by Chris Shores – see *Journals 54, 59 & 65*), so the problem with this latest essay is that it doesn't really have anything new to offer. There are occasional asides that acknowledge the essential contributions made by those who supplied and maintained the front line, but, as ever, these remain largely unexplored. Instead, a great deal of the narrative is devoted to descriptions of air combat in the form of extracts from official histories, squadron ORBs, published unit histories, the biographies of individuals, citations for awards and so on. As a result, a large proportion of the text is presented within inverted commas with just the title (no page number) of the source document usually (but not always) tacked on to the end of a quote, rather than as a conventional footnote or endnote. Furthermore, there is no bibliography, which makes accessing the original source, and then finding the specific passage in question, a somewhat laborious exercise. If one does take the trouble to check, however, it transpires that some of the quotations lack a certain degree of fidelity – the alterations or omissions do not change the sense of the passage, but they do devalue the use of quotation marks.

I was also troubled by variations in the presentation of names. Transcribing Arabic into English inevitably presents problems and individual contemporary documents do offer a variety of interpretations but, when brought together in a single volume, one

should surely standardise. Yet we have, Sidi Azeiz/Aziez, Tobruch/Tobruk, Mariut/Maryut, Mechili/Mechile, etc and such alternative spellings are not confined to place names; they also crop with people, as in Botwell/Bothwell, Bateson/Baterson, Gudeon/Guédon and even aeroplanes – Macchi/Maachi, and the Wg Cdr Rossier on p115 was surely Fred Rosier. All of this has to be down to proof-reading, but it engenders a sense of insecurity in the reader which makes him (or at least it did me) want to check the occasional fact and again, this sometimes reveals problems in that the details of a wartime account of an event may well differ from later versions that have been validated by post-war research – notably the optimistic contemporary claims of fighter pilots versus actual enemy losses. But, why recycle the original information if it is now known to be inaccurate?

On the plus side, this 282-page hardback has some 200 well-reproduced (bearing in mind the quality of some of the originals) photographs of people, places and aeroplanes with a substantial number of these sourced from South Africa, so there are many pictures of SAAF aircraft and personnel most of which are unlikely to have appeared before in a British publication. While there is no index, there are seven appendices, one of which, dealing with 'pets, parties, Christmas and songs', provides interesting social context. Another presents an excellent succinct account of the Takoradi ferry route and a third is a useful description of what passed for an airfield in the desert, although the listing of about 200 such aerodromes by obscure names, or even more opaque LG Numbers, tells us little – to be of any practical value we needed to be provided with their co-ordinates or, better still, see them located on a map. Another appendix, dealing with RAF heraldry, battle honours and medals seems a little out of place in a book dedicated to the Desert Air Force and the suggestion that the camel motif in No 45 Sqn's badge might reflect its 'association with Egypt in the Second World War' does not compute, because the badge was approved by KE VIII in 1936.

All of that having been said, if you are not particularly familiar with the nature of the air war over Egypt and Cyrenaica (this volume, covers only 1940-42, ending with the run-up to El Alamein; others are to follow) this book might be a good place to start. In his introduction, the author states that his 'short account is not a detailed history but

rather it is an impression, to that end I have not attempted to provide details of every action and every unit; some squadrons get barely a mention . . .' and that is a fair description.
CGJ

ROYAL AIR FORCE HISTORICAL SOCIETY

The Royal Air Force has been in existence for more than ninety 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 interwar 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 £18 per annum and further details may be obtained from the Membership Secretary, Wg Cdr Colin Cummings, October House, Yelvertoft, NN6 6LF. Tel: 01788 822124.

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 British winners have been:

1996	Sqn Ldr P C Emmett PhD MSc BSc CEng MIEE
1997	Wg Cdr M P Brzezicki MPhil MIL
1998	Wg Cdr P J Daybell MBE MA BA
1999	Sqn Ldr S P Harpum MSc BSc MILT
2000	Sqn Ldr A W Riches MA
2001	Sqn Ldr C H Goss MA
2002	Sqn Ldr S I Richards BSc
2003	Wg Cdr T M Webster MB BS MRCGP MRAeS
2004	Sqn Ldr S Gardner MA MPhil
2005	Wg Cdr S D Ellard MSc BSc CEng MRAeS MBCS
2007	Wg Cdr H Smyth DFC
2008	Wg Cdr B J Hunt MSc MBIFM MinstAM
2009	Gp Capt A J Byford MA MA
2010	Lt Col A M Roe YORKS
2011	Wg Cdr S J Chappell BSc
2012	Wg Cdr N A Tucker-Lowe DSO MA MCMI
2013	Sqn Ldr J S Doyle MA BA
2014	Gp Capt M R Johnson BSc MA MBA
2015	Wg Cdr P M Rait
2016	Rev (Sqn Ldr) D Richardson BTh MA PhD

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
Wing Commander C G Jefford MBE BA

SECRETARY
Gp Capt K J Dearman
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