ROYAL AIR FORCE

HISTORICAL SOCIETY

JOURNAL

73

First published in the UK in 2020 by the Royal Air Force Historical Society

ISSN 1361 4231

Printed by Windrush Group
Windrush House
Avenue Two
Station Lane
Witney
OX28 4XW

ROYAL AIR FORCE HISTORICAL SOCIETY

President	Air Chief Marshal Sir Richard Johns GCB KCVO CBE

Committee

Chairman	Air Vice-Marshal N B Baldwin CB CBE
Vice-Chairman	Group Captain J D Heron OBE
Secretary	Group Captain K J Dearman FRAeS
Membership Secretary	Wing Commander C Cummings
Treasurer	J Boyes TD CA
Editor & Publications Manager	Wing Commander C G Jefford MBE BA
Members	Air Commodore G R Pitchfork MBE BA FRAes
	Group Captain S Chappell MA MSc
	Peter Elliott BSc MA
	*J S Cox Esq OBE BA MA
	*Maggie Appleton MBE
	*H Raffal MA
	*Group Captain J R Beldon MBE MPhil MA BSc
	*Wing Commander H Whitehill MA

**Ex Officio*

CONTENTS

SELECTED GLOSSARY

A&AEE	Aeroplane and Armament Experimental Establishment
ACE	Allied Command Europe
ACMI	Air Combat Manoeuvring Instrumentation
ACOS	Assistant Chief of Staff
AEF	Air Experience Flight
AEO/AEOp	Air Electronics Officer/Operator
AFB	(US) Air Force Base
AFDS	Air Fighting Development Squadron
AFMOA	(USAF) Air Force Medical Operations Agency
AFV	Armoured Fighting Vehicle
AFVG	Anglo-French Variable Geometry (aircraft)
AR	Air Refuelling
ARS	Air Rescue Service
ARRS	Aerospace Rescue and Recovery Service
ASW	Anti-Submarine Warfare
ATC	(USAF) Air Training Command
ATTW	Aircrew Training and Test Wing
AUTEC	Atlantic Undersea Test and Evaluation Center
AW	Aviation Warfare
BAOR	British Army of the Rhine
BDG	Base Defence Group
BDS	Base Defence Squadron
CBRN	Chemical, Biological, Radiological and Nuclear
CCTS	Combat Crew Training School
CoC	Chain of Command
CONUS	Continental United States
COS	Chief of Staff
CPO	Chief Petty Officer
CSAR	Combat Search and Rescue
CTTO	Central Tactics and Trials Organization
CWGC	Commonwealth War Graves Commission
DCNO	Deputy Chief of Naval Operations
EATS	Empire Air Training Scheme
ESM	Electronic Support Measures
ETPS	Empire Test Pilots School
EW	Electronic Warfare
EWI	Electronic Warfare Instructor
EWOSE	Electronic Warfare Operational Support Establishment
FAA	Federal Aviation Administration
FCAS	Future Combat Air System

FLIR	Forward-Looking Infra-Red
FM	Flight Mechanics
FORNAT	Foreign National (US security classification)
FOST	Flag Officer Sea Training
FP	Force Protection
FTS	USAF Flying Training Squadron/RAF Flying Training School
FWOC	Forward Wing Operations Centre
GBAD	Ground Based Air Defence
GD	General Duties
GLO	Ground Liaison Officer
GPS	Global Positioning System
HQPTC	HQ Personnel and Training Command
HQSTC	HQ Strike Command
HUD	Head-Up Display
IP	Initial Point or Instructor Pilot
IFR	Instrument Flight Rules
ILS	Instrument Landing System
INS	Inertial Navigation System
IRE	Instrument Rating Examiner
IRT	Instrument Rating Test
ISS	Individual Studies School
ITW	Initial Training Wing
JROC	Junior Regiment Officers' Course
LRMP	Long Rang Maritime Patrol
LSJ	Life Saving Jacket
LST	Landing Ship, Tank
MAD	Magnetic Anomaly Detector
MAEOp	Master Air Electronics Operator
MER	Multiple Ejector Rack
MAC	(USAF) Military Airlift Command
MC	Mission Commander
MOU	Memorandum of Understanding
MPA	Maritime Patrol Aircraft
MRCA	Multi-Role Combat Aircraft
NADC	Naval Air Development Center
NAS	(US) Naval Air Station/Naval Air Squadron (RN
NASA	National Aeronautics and Space Administration
NATOPS	Naval Air Training and Operating Procedures Standardization
NBC	Nuclear, Biological and Chemical

NFO	Naval Flight Officer
NOFORN	(Security classification) No Foreign Nationals
OCU	Operational Conversion Unit
OEU	Operational Evaluation Unit
PAI	Pilot Attack Instructor
PIT	Pilot Instructor Training
PJHQ	Permanent Joint HQ
PSO	Personal Staff Officer
QFI	Qualified Flying Instructor
QHI	Qualified Helicopter Instructor
QWI	Qualified Weapons Instructor
RAG	Replacement Air Group
RIAT	Royal International Air Tattoo
RIO	Radar Intercept Officer
ROTC	Reserve Officers' Training Corps
SAC	(USAF) Strategic Air Command
SAM	Surface-to-Air Missile/
SAM	(USAF) School of Aerospace Medicine
SAR	Search and Rescue
SEngO	Senior Engineer Officer
SF	(USAF) Security Forces
SG	Surgeon General
SH	Support Helicopter
SHAPE	Supreme HQ Allied Powers in Europe
SNEB	*Société Nouvelle des Établissements Brandt*
SOAvMed	Staff Officer, Aviation Medicine
SOP	Standard Operating Procedure(s)
SSBN	Ship Submersible Ballistic Nuclear
STANEVAL	Standardisation and Evaluation.
TAC	(USAF) Tactical Air Command
TACCO	Tactical Coordinator
TAD	Tactical Air Direction (stud number/frequency)
TAOC	Tactical Air Operations Centre
TFS	Tactical Fighter Squadron
TFW	Tactical Fighter Wing
TIALD	Thermal Imaging Airborne Laser Designator
TOC	Tactical Operations Centre
VFR	Visual Flight Rules
WSO/WSOp	Weapon System Officer/Operator
XO	Executive Officer

THE US/UK EXCHANGE PROGRAMME

RAF MUSEUM, HENDON, 17 April 2019

WELCOME AND INTRODUCTION BY THE SOCIETY'S CHAIRMAN

Air Vice-Marshal Nigel Baldwin CB CBE

AVM Baldwin joined the RAF via Cranwell to become a Vulcan pilot for most of his flying career, culminating in a tour as OC 50 Sqn, before commanding RAF Wyton. His more senior appointments included stints at the MOD and HQ Strike Command, his final appointment being Assistant Chief of Defence Staff (Overseas). Since leaving the RAF in 1996 he has been actively involved in a number of organisations, the Ex-Services Mental Welfare Society, 'Combat Stress' and the RAF Historical Society which he has now presided over for some twenty-three years.

Ladies & Gentlemen – good morning

Before I introduce our Chairman for today, Air Marshal Sir Robert Wright, let me give my usual thanks to Maggie Appleton, the Chief Executive of the RAF Museums, and her always helpful staff.

In June 1985, as a group captain, I spent a year in Washington DC as an International Fellow at the National Defense University with about twenty others of that rank or one-star, from twenty different countries. We were attached closely to the National War College and to the Industrial College of the Armed Forces, all on the same campus at Fort Leslie McNair, named after one of the four US Army generals who died on active service during WW II (sadly, in his case, killed by friendly fire in France just after D-Day). Our course was broadly equivalent to London's Royal College of Defence Studies.

But six years before that experience, having just finished commanding No 50 Sqn, Vulcans at Waddington, in the summer of 1979 I was lucky enough to be posted, with two other wing commanders, to Maxwell Air Force Base just outside Montgomery, Alabama to spend a year at the USAF's Air War College followed by two years on the Faculty – we would say the Directing Staff – of the

The impressive entrance to the ACSC at Maxwell AFB.

Air Command and Staff College – the ACSC – which was next door to the Air War College.

My first impression was of the sheer size of the USAF operation: the Air War College had about 200 students – lieutenant colonels or equivalent (including a few drawn from the US Navy, Marines, Army and some civil servants, including the CIA). There were seventeen students from other countries. Our Saudi colonel went on to become the commander of the joint Arab forces in the first Gulf War, sharing overall command with General Schwarzkopf, and the Jordanian wing commander, Sam Shurdom, who was in my entry at Cranwell, reached the very top of the Royal Jordanian Air Force.

My closest US Army friend there, Wayne Downing, who was in my seminar group of about a dozen, went on to become CinC of Special Operations Command.

Other main impressions of my time there were that practically all of the US students had done tours in South East Asia, several of them many times. The last American was withdrawn from Vietnam in March 1973; six years later, at Maxwell, many were obviously still seared by their experience. One I was close to in my seminar was shot down flying an F-105 and spent six years in Hanoi's infamous 'Hilton'.

Having taken up my appointment at the ACSC, I was again impressed by the scale, the sheer size, of the American military. There

were 576 students for the year's course. They were broken down into thirty-six seminar groups (syndicates in Bracknell parlance) each overseen by a lieutenant colonel or equivalent 'Faculty Instructor'. All but one of the of the thirty-six faculty instructors were US officers; I was the only foreigner. The RAF has had an officer on that faculty ever since the College opened in 1946. Even today, the RAF wing commander slot has been retained; since my time, the College has added only two more foreign officers, a Canadian and a Singaporean – and that alone tells you something about the RAF's very long and close relationship with the USAF.

Several of today's speakers are likely to mention how valuable their time on exchange would prove to be during their subsequent careers. That was certainly true for me, especially in the first Gulf War and later when I was on the MOD policy staff.

Let me now turn to our Chairman for today, Air Mshl Sir Robert Wright. Beginning his RAF flying career as a Hunter pilot on No 8 Sqn in Bahrain, of particular relevance today is that, as a squadron leader, he served on exchange duty with the US Navy as a Fighter Weapons Instructor flying the F-4J Phantom. I am sure he will have something to say about that!

Much later, he commanded No IX Sqn, Tornados at RAF Brüggen. Two years later, after serving as Personal Staff Officer to the then Chief of the Air Staff, he returned to Brüggen as Station Commander. A series of NATO posts followed, culminating in his, by now an air marshal, becoming the UK Military Representative to NATO and the EU at NATO HQ in Brussels. When he retired, he became the Controller of the RAF Benevolent Fund.

With all of that behind him, and much else, he is splendidly qualified to chair today's programme so Sir Robert, 'You have control'.

OVERVIEW OF THE HISTORY OF RAF/US EXCHANGE PROGRAMME

by Air Mshl Sir Rob Wright

Sir Rob Wright joined the RAF in 1966 and flew Hunters and Phantoms before switching to the Buccaneer in 1979. Following a tour with No 208 Sqn he commanded No 9 Sqn (Tornado) and RAF Brüggen. Staff appointments included the DS at the RAF Staff College, PSO to CAS and as Military Adviser to the UN High Representative in Sarajevo. More senior posts included, Air Cdre Ops at HQSTC, COS to AMP, DCinC at HQPTC, ACOS Policy & Requirements at SHAPE and as the UK Military Representative to NATO and the EU. Following retirement in 2006 he spent six years as Controller of the RAF Benevolent Fund.

Thank you Nigel, and good morning Ladies and Gentlemen. May I add my own welcome, and thanks to you all for giving up your time to join us today.

A particular welcome to the US Air Attaché, Col Emmett Wingfield, and to Gp Capt Jim Beldon from the Air Staff (and thanks too to Wg Cdr Helen Simpson, who is unable to attend today but who is responsible for managing today's RAF Exchange Programme.) We are particularly grateful for their support in the planning of this seminar and, if time permits, we hope to have an update on the current programme in the discussion period.

However, today we are focused on the *historical* perspectives because, from this Society's standpoint, it is necessary to formally record this important period.

Since the publication of *Seeing Off The Bear*[1] in 1995 there has been a relative dearth of information relating to the contribution made by the exchange programme to the 'special relationship' which, whilst at times in choppy waters politically, has nonetheless been extremely well underpinned by our military links and remains a keystone of our enduring relationship.

We cannot, in one day, do this programme justice but we can make a start in attempting to redress this gap in our history so that our

successors and researchers have the benefit of our experience.

The key features of the programme are:

- Its longevity – it has clearly stood the test of time.
- Its size – it is the largest exchange programme in the Western aviation world.
- Its scope – it encompasses all disciplines and practically all branches and organisations: aircrew; engineers; administrators; the Regiment; doctors; various Colleges and so on.

Today's programme deliberately focuses on the view from the cockpit, allied to the operational support experiences from the RAF Regiment, in order to give us a foundation and a start point to record lessons learnt. We will also draw upon the perspective from 'across the pond' with a presentation by Don Fennessy of the US Navy – and thank you Don for making a special trip to be with us today.

The aims of the exchange programme may be summarised as:

- To experience US capabilities, aircraft, equipment and support infrastructure.
- To create mutual trust, understanding and common benefit.
- To influence and reinforce US knowledge of the RAF.
- To share and standardise procedures in the air and on the ground.
- To develop personal contacts for the future.

That said, like, I suspect, most of its participants, I was never actually briefed on these! – but our aim today is to record some of the achievements of the Programme. Anecdotes are welcome, of course, because they will contain the core of our lessons learnt.

Speakers, we have a busy day ahead of us, so please stick to the timings and try not to repeat what you have already heard – in other words watch the clock and be flexible – which should not be difficult for sharp operators like you!

I recall that, once upon a time, back in 1984, I was a member of the RAF Staff College Directing Staff. I was presenting at the Air Command and Staff College at Maxwell, Alabama where I was briefed on the 'Maxwell Hook' – a large shepherds staff designed to drag reluctant speakers off stage. I avoided it then, you need to today!

And so to begin with a brief history. The formal exchange scheme

was conceived in the late 1940s. There was much early enthusiasm by the likes of Eisenhower, Tedder and Eaker but the press, first the *News Chronicle* and then *Flight* magazine, got wind of the proposals and published them (nothing new here!) leading to the Prime Minister demanding to know what was going on (nothing new here!) followed by Civil Service and Treasury concerns over cost and politics (nothing new here!) Nevertheless, the obstacles were overcome, leading to a limited programme in 1947, focused on USAF academic establishments, followed by a similar programme with the USN in 1949. This exchange scheme rapidly became a much more ambitious programme of up to 100 personnel encompassing most Branches. Indeed, a most notable first example was that of OC No 1 Squadron RAF in 1949, the redoubtable Major Robin Olds – Mr Top Gun.

Of particular note was the placement of RAF officers at the USAF Academy (one GD, one Regiment and two Educators) which ran from the late-1950s to 2012 when it was curtailed to focus on front line appointments. The Academy, from whose alumni most USAF generals were eventually selected, had an annual intake of about 1,000, which meant that, while the scheme had lasted, some 50,000 officers had an early introduction to the Royal Air Force from which many influential and enduring friendships resulted.

Returning to the broader exchange programme, by 1969 numbers had been reduced to 86 and during this period archived correspondence shows that concerns were being raised about exchange officers becoming involved in operations. Indeed, prior to the Lebanon conflict (in 1983), a Harrier exchange pilot, Malcom White, was airlifted off a US carrier en route to the conflict zone and dumped in Cyprus! You may care to reflect on this aspect of your own experience, given our subsequent considerable engagement with the USAF/USN/USMC and the ‘black’ programmes.

But there is no avoiding the fact that, reflecting the remorseless contraction of the RAF, there has been a corresponding reduction in the number of exchange opportunities. By 2009 we were down to 58 USAF/USMC/USN posts and today it is only 43 (from a total foreign exchange programme of 85 posts with thirteen nations).

It is important to reflect that, since the inception of the exchange programme, the RAF has participated in numerous operations alongside the USAF – Korea, the Balkans, the Gulf, Iraq, Afghanistan, Syria, etc

An F-4J Phantom of VF-171, 'The Aces'.

so the breadth of our engagement has been, and remains, considerable. No two nations have been so closely aligned, and that continues today, not least through the acquisition of the F-35 and P-8, and it is thanks to the agreement to embed RAF and RN personnel within US maritime forces that critical capabilities have been maintained through the fallow period since the demise of the Nimrod in 2010.

Of course, no event would be complete without a mention of Brexit and against the positive backdrop of our engagement with the US (and others) I find it astonishing that we are, as a potential 'third country', deemed by some Europeans to be a security risk and will be denied access to Galileo and the European Future Fighter project. Remarkable!

So much for the background, let me now set the scene with my own personal reflections. In 1976, as a squadron leader, I was posted as a Fighter Weapons Instructor, to VF-101, the F-14/F-4J conversion unit.

Shortly after joining the squadron, the F-4J element (consisting of *only* 24 aeroplanes!) was split off to become VF-171 with myself as the sole Fighter Weapons Instructor (I had recently completed a Qualified Weapons Instructors Course at the RAF Tactical Weapons Unit at Brawdy)

This unexpected posting required a lot of study into USN tactics and how they planned to operate the F-4J, which had been optimised for air defence, in the ground attack environment – with a very different modus operandi compared to European tactics. At the same time, the lead Radar Instructor was an RAF navigator who ran the Radar Phase – an essential aspect of the F-4J, in any role.

Soon after VF-171 was formed the Skipper asked me to run both the Instructors Conversion course *and* the Student Conversion Phase. This, despite my not being a QFI. But the Navy does not believe in such refinements on an Operational Conversion Unit – and indeed we had no two-stick aeroplanes anyway! In time, I also ran the AAR phase.

As a consequence, and within a year, the two RAF exchange officers were responsible for *all* training phases other than Air Combat Manoeuvring (ACM), which was carried out at Key West, and carrier conversion, which took place at sea of course. It was a considerable amount of responsibility and represented a high degree of trust on the part of the Skipper of the day. We were, of course, both required to complete carrier qualification, operating at sea for that period, and we did the 6-week ACM course during which all students fired a Sidewinder and the top student a Sparrow!

I am sure that other speakers will have had similar experiences, but, to me, the considerable responsibility that I was given indicated the degree of trust and confidence that the US Navy was prepared to invest in its exchange officers.

A word about 'scale'. NAS Oceana is the major east coast fighter and attack base, home to half of the squadrons that made up the USN's thirteen Carrier Air Groups at the time (they still have eleven!) It brought home to me the comparative size of our air force – and that, or indeed those, of the USA. In terms of power projection, Oceana alone was home to more than 300 fast jets – and the air element of USMC was bigger than the entire RAF. I recall flying into Little Rock Arkansas and seeing 120 C-130s on the ground. I had a similar experience when I deployed to Nellis for Red Flag in 1980 with 208 Squadron's Buccaneers where, once again, the sheer scale of American capability was mind boggling – I am sure we are all glad that we are on the same side!

As the two exchange officers on VF-171 we were able to produce mutual benefit in other ways, for example, in giving regular presentations to help broaden the relatively narrow perspective that the average USN pilot and RIO[2] held about the Warsaw Pact and the Cold War stand-off in Germany. They were surprised to learn: of the scale of the UK's commitment to NATO, both at home and forward deployed in Germany; of the RAF's roles, both conventional and nuclear; and, of course, of the 55,000 troops in BAOR. On the west coast this lack of

A question of scale – an F-4J of VF-31 over just one corner of the vast expanse of NAS Oceana.

awareness was even more marked, because the West Coast Navy was, not unnaturally, preoccupied with threats in Pacific region.

Before closing, I will describe an incident that, I think, illustrates the extent of our mutual trust, flexibility and cooperation – although this story, which I call 'Lend Lease 1977-style' is, almost entirely, a one-way affair.

On her final cruise before decommissioning, the RN's last fixed wing carrier, HMS *Ark Royal*, was working out of Jacksonville before sailing to Gibraltar in the Queen's Jubilee Year. In brief the story unfolded thus. There was a phone call. The *Ark* had a boiler problem and needed to dock at Norfolk for repairs. So – could I arrange for the Air Wing to make an unplanned deployment to Oceana for a week? I flew down to Jacksonville to discuss this informal, unofficial request which, as it turned out, would involve the provision of ramp space, training time, the use of air combat manoeuvring instrumentation

A question of scale – 'Little and Large' – HMS Ark Royal *compared to the USS* Nimitz *at Norfolk Va.*

(ACMI) on the range and participation by an Aggressor Squadron. 'Oh, and by the way, we don't have Sidewinder simulator pods for the ACMI – could we borrow some?'

In due course all of this was arranged and then authorised (and the USN pods that were loaned worked!) by VF-171's Skipper, Capt Jerry 'Devil' Houston; and it was all contained (disguised!) within his budget. 'Just put it down as CV training' – no civil servants involved!

Pay back? Some excellent air-to-air combat training for us all and some superb cocktail parties, plus the vandalising of No 892 Sqn's Phantoms on the last evening. There was no time to rectify this and the aircraft flew back to the ship as you see in the accompanying picture – which upset the admiral considerably! Perhaps unsurprisingly, this unusual paint scheme became very popular in the modelling and art print world.

Conclusion

In concluding, let me reflect briefly, upon the long-term benefits and implications of my tour. Apart from being an exhilarating experience, it stood me in good stead in many subsequent postings. For example, I participated in Red and Maple Flags with Buccaneers and Tornados on

One of No 892 Sqn's Phantoms after it had been press-ganged into the US (Confederate) Navy.

four separate occasions when my familiarity with US procedures and mind-sets paid dividends. As it did in more senior later appointments, for instance, while, as Air Cdre Ops, accompanying CAS and AOCinC Strike at high level briefings in Washington in 1996, as ACOS Policy and Requirements at SHAPE in 2000 and as the UKMILREP to NATO and the EU in 2003.

It is now my pleasure to hand over to one of the masterminds behind today's seminar, Gp Capt Jock Heron.

Notes:

[1] Published by the Air Force History and Museums Program in 1995, *Seeing Off The Bear – Anglo-American Air Power Co-operation During the Cold War* recorded the proceedings of a three-day symposium held at Bolling AFB, Washington DC in 1993 under the joint sponsorship of the Air Force Historical Foundation and the RAF Historical Society.

[2] RIO – Radar Intercept Officer.

F-105 – FROM COLD WAR DETERRENT TO VIETNAM WARRIOR

by Gp Capt Jock Heron

Jock Heron graduated from Cranwell in 1957 to fly Hunters and, during a later USAF exchange tour, F-105s. Following a stint working on the MRCA project, he spent ten years in the Harrier world, flying it in Germany, and as a staff officer at both Rheindahlen and MOD. He commanded RAF West Drayton and RAF Stanley before leaving the air force to spend the next ten years with Rolls-Royce as their Military Affairs Executive. He is currently Vice-Chairman of this Society and a Director/Trustee of the Bristol Aero Collection.

I was fortunate to have been posted as an instructor to the F-105 OCU at Nellis in 1965 because the RAF had no equivalent type, having missed a generation of all-weather fighter bombers while awaiting TSR2 to replace the Canberra. So in March 1965 I had the privilege of sailing to New York with my family, before the days of the regular shuttle by RAF VC10, followed by a train journey to Washington where the Embassy staff described the procedures which we would follow during our stay in the USA and to brief us on the main aims of the exchange tour. The staff were helpful and covered some of the notable differences between the US Air Force and the Royal Air Force, some of the pitfalls and a series of cautionary tales on previous embarrassments and how to avoid repeating them. The domestic arrangements for my family were covered and we were given a fistful of dollars, or more accurately a US Bank cheque, as a 'settling in' allowance which of course had to be repaid during our first year in the USA. We set off to Nevada via Chicago, by Boeing 707 and Douglas DC-8, and landed at Las Vegas McCarran civil airport in a temperature of about 25°C on a fine spring afternoon.

My predecessor in the RAF exchange post met us on our arrival and transported us to Nellis Air Force Base, about eight miles north of the city. Nellis is regarded by the USAF as the 'Home of the Fighter Pilot' and in 1965 there was ample evidence on the ground and in the air. The base had been created in 1941 as the Las Vegas bombing and gunnery

school and it expanded rapidly during the Second World War when it was a base for training B-17 bomber crews. After the war the activity levels reduced for about three years until the start of the Cold War when the base was expanded further to fulfil its new role as a training base for fighter pilots. To the north lay the vast training areas and weapons ranges embracing some 12,000 square miles which included the Nevada nuclear test site and Area 51. The Korean War added to the importance of Nellis and since then it had become the principal fighter base within the USAF's Tactical Air Command (TAC). Las Vegas means 'The Meadows' in Spanish and the site of the original settlement is a natural oasis in an arid mountain desert where underground springs brought water to the surface. Due west is the south end of the Sierra Nevada rising to the peak of Mount Charleston at 12,000 feet and beyond is Death Valley some 250 feet below sea level. In the late 1930s the Hoover Dam was built to contain the waters of the Colorado River, about 20 miles to the east of the city, and the huge man-made Lake Mead extends to the entrance to the Grand Canyon about 100 miles to the north east. It is awe-inspiring country, rich in natural scenery but extreme in climatic conditions, with a summer temperature reaching well above 40°C with almost no humidity and insignificant rainfall. In the winter, temperatures were below freezing in the high desert, so we had to wear cold weather flying clothing when we flew over the mountains.

The unit to which I was assigned was the 4520th Combat Crew Training Wing whose establishment included about fifty F-105s for the operational conversion of new pilots and six T-39 Sabreliners for radar system familiarisation. The Vietnam air war had just begun and the demands on the training programme were intensive. Nellis also housed the Fighter Weapons School with F-100 Super Sabres, F-105 Thunderchiefs and a few of the USAF's first F-4C Phantoms for operational test and evaluation, the Thunderbirds USAF Air Demonstration Squadron, with its eight F-100s and the 4521st Combat Crew Training Squadron with several F-86 Sabres and T-33 trainers for training third world air forces. An assortment of other aircraft including a few light transport aircraft and helicopters added to the activities on this very busy base.

The USAF had used fighters, such as the Super Sabre and Voodoo, adapted for tactical strike and recce but they had limited all weather

An F-105D 'Thud' of the Nellis-based 4526th Combat Crew Training Squadron.

capability so the requirement emerged for an aircraft, customised for the nuclear mission with its weapon carried internally hence, Republic's F-105 Thunderchief, known widely as the Thud. By 1959, some early B models had entered service with an impressive external weapons load and although early reliability was poor, both air and ground crews gained valuable type experience. However, the B lacked the Thunderstick avionics system, the core of the all-weather low level strike capability of the later marks. The fully operational model was the D and, from 1960, it equipped TAC's Combat Crew Training Wing at Nellis, to which I was assigned, plus six operational wings in Germany, Japan and the US. The final production batch of 140 was the F two-seat trainer, the last of which arrived to coincide with the start of the air war over Vietnam, the beginning of my tour and the cancellation of TSR2, much to the surprise of my new USAF colleagues who regarded the aircraft with some admiration.

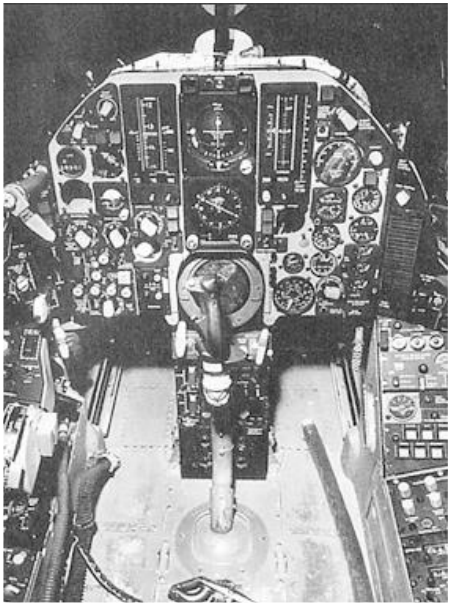
Many servicemen were fulfilling their draft obligation but displayed a positive and loyal attitude to their time in uniform. Emphasis on quality was reinforced by a well-publicised programme called 'Zero Defects' and this culture was carried over to every discipline from flight safety to engineering and administration. Serviceability was good but

the flying programme was surprisingly relaxed, averaging only two waves per day which, compared to an RAF unit, was pedestrian but consistent with USAF logistics policy.

I joined one of two training squadrons each with about twenty full-time instructors and some part-timers from other units at Nellis. Most were seasoned operators with over 2,000 hours mainly on the F-100, but with varying time on the F-105. Several had been stationed in the UK and a few were old friends from my Hunter days at Waterbeach, when they had been flying F-100s from nearby Lakenheath. I was less experienced but with several fighter types in my log book I was confident that I could instruct students on a new aircraft in a flying environment and roles in which I was unfamiliar, providing I could learn quickly! I did not undergo any preliminary theatre familiarisation but was given a shortened Thud conversion alongside nine students fresh from pilot training and shared their ground school which was extensive and well-integrated with cockpit time. Having gained the trust of my hosts I was given a tailored flying syllabus in all the various disciplines to bring me up to Instructor Pilot status and by the end of my abbreviated course in June, I was instructing my fellow students. This was accepted by them with good humoured respect and I was impressed by their attitude.

Adapting to USAF SOPs for briefing and flying using comprehensive check lists was straightforward but highly regimented, understandable in view of the large numbers of pilots spread across three continents. Standardisation was vital, with little room for deviation; a culture which, although vital for the nuclear mission, was detrimental to tactical flexibility over Vietnam. The six-month syllabus covered all modes of flight, tactics and weapons delivery. Before flying the D, students were given five simulator rides and two familiarisation trips in the rear seat of the F where the view was poor so for later dual sorties with the student in the front, the instructor‘s role was to act as safety pilot, demonstrating manoeuvres and monitoring the student's handling. When in my aircraft, students were well aware that if they flew unsafely, the world's best autopilot in the back would assume control!

Thunderstick avionics were analogue with neither inertial platform nor HUD, but the nose radar provided air-to-air search and track with air-to-ground modes for mapping, target acquisition and terrain



The cockpit of an F-105F – note the way in which the radar display is obscured by the control column.

avoidance. This was complemented by a master reference gyro, air data computer, autopilot and a Doppler radar for navigation and bombing which, together, comprised the core of the D's all weather capability, and was sufficiently accurate for a one megaton bomb! Simulator training plus two sorties in the T-39, with its nose radar and three consoles in the cabin, replicating the Thud's avionics, provided some experience before students were exposed to the aircraft's comprehensive visual and blind nuclear delivery systems on the bombing ranges. Combat profile missions followed where the most demanding saw the students in the back under a canvas hood flying at low level for over an hour, using duplicated controls and displays, to navigate blind, avoid terrain and deliver a practice weapon at a specified time on target within the Nellis ranges. Operating the Thunderstick system required concentration to ensure that the aircraft could be flown safely at heights around 800ft through mountainous terrain without visual reference. Flight instrumentation was the Bendix equivalent of the British OR946 and my only criticisms of the spacious cockpit were that there was no radar altimeter, some switch sequences for weapons delivery were complicated and the radar scope, essential for bombing and terrain avoidance, was placed low on the instrument panel, partly obscured by the stick top.

The automatic bombing system was designed for the nuclear mission and as the daylight attack roles of the Vietnam War assumed priority, the balance moved to conventional weapons training, aimed traditionally through the gyro gunsight. Students experienced the full

The F-105 was originally equipped for probe and drogue-style AAR but, circa 1960, the USAF opted to standardise on the flying boom system. Suitably modified, the F-105 continued to offer both options.

range of weapons and the Thud with its small wings needed careful handling at heavy weights. So, combined range sorties involved level delivery of practice bombs, rocketing and dive bombing – the SOP for operations in Vietnam. As weight reduced this was followed by strafing, with the internal M61 Gatling gun and although the Thud was unsuited to the art of dogfighting, students were taught air-to-air gunnery against a towed dart target and launched a Sidewinder against a flare. I had responsibility for briefing air combat tactics to all our students so they could learn that survival in the skies over North Vietnam meant using the Thud's very high maximum speed to avoid, rather than attempt to outmanoeuvre, the agile MiG-17 and MiG-21. Having been promoted in June 1966, I became a Flight Commander and to a certain extent was able to influence instructional procedures. While supporting the fundamentals of SOPs, I stressed the importance of thinking and performing beyond the check list using experience and initiative to dictate tactics.

After the weapons phases, students learned to refuel from the KC-135 tanker by day and night using both the probe and receptacle systems, the latter being the preferred method. Realistic tactical training followed, with simulated attack profiles flown against dummy airfields with parked aircraft, missile sites and transport facilities in the Nellis ranges; installations which, some years later, were enhanced for Red Flag exercises. Manoeuvres were rehearsed over the tactical ranges in flights of four to ensure that students were familiar with the profile before they went into combat. This phase culminated in a heavyweight

sortie carrying the standard drop tanks but with six 750lb bombs on the centreline MER and two on the outboard pylons. The total weight of the Thud in this configuration was over 25 tons so the lengthy ground roll and high take-off speed introduced students to the weapons loads and profiles flown from the Thailand bases at Korat and Takhli against targets in North Vietnam. As one of my colleagues put it, 'We're trying to make training as realistic as bloodless combat so that when the students go into action they will think warfighting is bloody training!'

Vietnam operations involved multiple formations refuelling over Thailand before entering North Vietnam airspace at about 15,000ft. Approaching the target, afterburner was needed to climb to about 20,000ft before rolling into a steep dive to release the bombs with recovery above 5,000ft to avoid light anti-aircraft fire. During my tour, the high turnover meant that students were sent directly to Thailand instead of consolidating experience in Germany or Japan. Aircraft losses led to some B models being refurbished for instructors' use and a shorter course was introduced to refresh experienced pilots from other roles. On the front line this policy led to a frustrating imbalance within role expertise, combat experience, rank and skill.

The first fighter to be lost to a SAM-2 was a Phantom, and to counter the threat several F-100 two-seat variants were configured quickly as Wild Weasel SAM hunters, with sensors operated by an EW specialist in the back seat. Aircraft limitations and primitive avionics led to the development of the F-105 Weasel and some of my colleagues were posted to a secret training unit at Nellis. After they began operating from the bases in Thailand new EW tactics were developed and jamming pods were fitted to some attack Thuds. This led to a contentious new SOP for tighter tactical formations, giving the podded Thuds overlap protection and although the equipment and tactics were classified as NOFORN, I was briefed privately so that I could fulfil my instructor's role by appreciating how the Weasels remained for thirty minutes or more over the targets suppressing the SAM sites, to protect the attack formations.

Perhaps less relevant to RAF history, but my exchange tour gave me some unique experiences such as an emergency diversion to the secret Groom Lake in Area 51, with a suspected electrical fire. I was on a training sortie to the north west of the restricted area when my cockpit filled with smoke and having been given permission to make an

emergency landing, the airfield looked deserted as I passed through the overhead before setting up for my approach and landing. The Thud was well over maximum landing weight and I flew a wide circuit before making my final approach at a higher than normal speed to allow for the extra four tons of fuel. Touchdown was gentle, the braking parachute deployed normally and, in my peripheral vision, I glimpsed a ‘distance to go’ marker board showing that there were another 18,000 feet of runway remaining! The aircraft was slowed gradually to normal taxiing speed before turning off the long runway. Because of the continuing risk of an electrical fire I shut down the engine and electrics on the taxiway and the smoke did not disperse until the canopy was opened. Two vehicles met me, one of which was an engineering truck and crew and the other contained two men in civilian clothes. Having dismounted from the aircraft and ascertained that there were no external signs of fire I left the aircraft in the hands of the ground crew and was invited to board the second vehicle which took me to one of the hangars adjacent to the aircraft parking area.

Conversation was limited to the events surrounding the aircraft's emergency and I was escorted to a room without windows where I was given a welcome cold drink. The ensuing debriefing was courteous but prolonged and I was reminded of the classified nature of the airfield. About an hour later one of the groundcrew appeared and spoke a few quiet words to one of my interviewers which confirmed the cause of the smoke in the cockpit. Apparently, the cold air turbine for the cabin refrigeration system had seized and the lubricant had overheated and burned within the system’s pipework. Although there was little real danger to the aircraft, the effects in the cockpit were alarming and consistent with the system failure. In the light of this evidence that there had been a genuine malfunction the two men adopted a much more relaxed manner and we exchanged flying banter for a time. Meantime my student had been ordered to land after he had burned off fuel to his normal landing weight and after being debriefed separately his aircraft was refuelled for his return to Nellis. It was agreed later that I could return to base without the cold air system which, because of the failure, would be isolated by the engineers.

One of the hosts looked at his watch and invited me to follow him outside. We stood in the baking midday sun at the edge of a large aircraft parking area where two aircraft stood, an F-104D Starfighter

and an F-101B Voodoo, both of which were two seaters. There was an audible deep engine sound which wasn't generated by either the J79 of the F-104 or the two J57s of the F-101, both of which had individual engine noise characteristics, but there was no sign of any other aircraft. A few minutes later the F-101 started its engines and my host then said, 'You'll be interested in this.' The doors of a hangarette opposite opened to reveal the source of the earlier unidentified engine noise. It was an aircraft, pointed straight at our position, which I was able to identify later as a Lockheed A-12, the single seat forerunner of the SR-71. This sleek black shape then emerged from its cover, passed us while taxiing to the end of the runway and, within a few minutes, took off with the Voodoo in pursuit. Naturally as a mere flight lieutenant I was awe-struck to have been so close to this spectacular and highly classified product of the Lockheed Skunk Works.

After a brief snack lunch, I was returned to reality because my aircraft was pronounced ready to fly and it was time to leave the remote test site and fly back to Nellis. After a final word from my host of the need for discretion, I boarded my Thud, started the engine, taxied to the end of the runway and took off for the short return flight to Nellis. Because the cabin air system had been inhibited, I climbed to a relatively cool 10,000ft and turned my back on the Ranch, conscious that I was privileged to have been there. When I arrived back at the squadron no questions were asked about where I had been. Those who needed to know had been briefed and, despite the odd raised eyebrow, my diversion was not discussed. The following day I was flying another Thud on the same bombing range with the same student flying on my wing when he suffered a fuel transfer emergency and again the procedure for such a failure was to land as soon as possible. When asked by air traffic control at the test site to pass my flight details on the emergency frequency I said merely, 'Same as yesterday.' I was told crisply that I could return to Nellis after monitoring my student's landing. Perhaps the authorities had seen enough of the visiting Scot at the Ranch and two days running was more than they were prepared to accept!

The following year on a flight into Edwards with a student who was undergoing instrument training in the rear seat, I noticed a plume of smoke rising from the desert some way to the north. I was about to begin the descent into Edwards when the controller told me to return to Nellis

and, as no explanation was offered, I asked that we be given at least one ILS approach for the student rather than returning to base without having achieved any worthwhile training. The polite but firm reply was ‘Negative’ so without further debate we returned to Nellis to be told after landing that an XB-70 had crashed following a mid-air collision with an F-104. Apparently, the General Electric engine company had arranged a publicity photograph of the XB-70 in formation with the F-104, an F-4 Phantom, a T-38 and an F-5, all of which were powered by GE. A photographic Learjet accompanied the formation and during an orbit. the F-104 had come too close to the XB-70 whose big anhedral delta wing had caused the small fighter to roll into one of the vertical fins and within about ten seconds the bomber pitched down out of control, disintegrated and smashed into the desert floor which explained the source of the plume of smoke over the Mojave. One of the XB-70 pilots escaped by ejecting but the second pilot was killed together with two other crew members and the F-104 pilot. It was a stupid and entirely avoidable accident which was caused by inexperience and failure to brief adequately before flying the sortie, which had been thrown together with neither proper planning nor briefing.

At a dinner to mark the departure of the Sabre from the USAF in June 1966 I was asked by the squadron commander if I had ever flown the Sabre to which my answer was, ‘ Sadly, no Sir.’ So he said that I ought to fly it before the last aircraft, which was undergoing maintenance, departed for the Davis-Monthan AFB ‘Boneyard’ within the next two weeks or so. I accepted his offer promptly, but he was relaxing after a busy day and, having enjoyed a few beers, his judgement probably was suspect. He explained, slightly the worse for wear, that he would have to ask permission from the Wing Commander at Nellis, a Brigadier General, but I was stone cold sober and offered to approach him myself. The General, who was standing at the bar only a few feet away, heard parts of the conversation and asked, ‘What do you want Jock?’ When I told him of my ambition to fly the Sabre his initial answer was, ‘No’, because my terms of service with the USAF did not include flying anything as first pilot and captain, other than the type on which I was qualified, namely the F-105 Thunderchief.

However, the Nellis Wing Commander was Brigadier General Frank K Everest Jr, the legendary Edwards test pilot and one of my schoolboy heroes. He had reached M2·9 in a Bell X-2 rocket plane in 1956. He

Jock flying the last F-86 at Nellis, photographed by a USN colleague.

was a contemporary of Chuck Yeager and I had read his book, *The Fastest Man Alive,* written shortly after he flew the X-2 to a record speed of M2·9 following the death of one of his test pilot colleagues whose flight in another X-2 had probably reached M3·1 but which ended in disaster when the aircraft yawed violently and disintegrated. I countered his initial refusal by making some ingratiating remarks about his book and his wide experience observing that he had flown the Hunter from Dunsfold in 1953. 'How did you know that?' he asked, and I explained that I had read an account of his experience in a *Flight* magazine 13 years before. 'That was different,' he said, 'Neville checked me out!' Many years later I recounted this story to an amused Neville Duke, another schoolboy hero who recalled clearly the visit to Dunsfold by the team from Edwards to evaluate the Hunter. I went on to mention my own brief experience of flying a rocket propelled fighter (the Mirage IIIC in 1964) two years before. He expressed some interest in my Mirage sortie and recognised that I was serious about flying the Sabre.

I really wanted to fly this famous aircraft before its departure from the front line so finally he relented and authorised me to fly one sortie. He went on to warn me, 'Jock, it's your neck and its mine so don't break it.' I didn't ask if 'it' meant my neck or the aircraft! Trust prevailed and, suitably briefed, I flew the final Sabre sortie from Nellis, photographed by my US Navy squadron colleague who, seven years later, became the last casualty of the Vietnam war, shot down in a Phantom a few hours

Jock taking on fuel during his trans-Pacific delivery flight.

before the ceasefire.

Later that year I asked to take a Thud across the Pacific to Japan to experience ‘real’ air refuelling rather than just training. Previously my longest trip was three hours in a Hunter, so I wanted to understand some of the issues surrounding lengthy sorties in fighters. The helpful ferry unit suggested that I eat only a ‘low residue breakfast’ and before departing from McClellan AFB in California we were issued with a ration pack containing a carton of orange juice and bite-sized sandwiches, to minimise the difficulties of eating while wearing an oxygen mask. Although the snack kept away the hunger pangs and the orange juice ensured a satisfactory level of fluid intake, it was important not to eat or drink excessively to ensure that the body's waste disposal system did not need to be activated in the tight space of a fighter cockpit, even in one as big as the Thud's. It was frustrating however as we drew alongside our KC-135 to see the crew of our tanker in shirt sleeves waving chicken legs and cans of soft drinks as they ate their way from the mainland to Hawaii, a five-hour sortie, followed by a seven-hour leg to Guam and a shorter trip to Okinawa, in close formation with my tanker for an hour in cloud at the top of a typhoon.

Despite the political differences over Vietnam between Britain and the USA, the bond of mutual respect between the RAF and the USAF was evident, particularly with those who had served alongside us. Trust and sound personal relationships were established early and I was

fortunate to join a gathering of likeminded fighter pilots whose shared values enabled this spirit to prosper. My flying experience increased by over 700 hours during my tour and I witnessed the USAF undergoing extensive review as the threat developed in the skies over Vietnam. Feedback of air intelligence was rapid and tactics benefited accordingly but there was harsh criticism by aircrew of the Pentagon's inflexible tactical dogma which dictated standard routes, timing and attack profiles. Many years later I learned of the bizarre political betrayal which led to such high losses by the USAF and US Navy. Targets for the following day were being passed via the Swiss Embassy to Hanoi with the aim of demonstrating 'to the North Vietnamese leadership that we could strike targets at will, but didn't want to kill innocent people. By giving the North Vietnamese advanced warning of the targets to be attacked, we thought they would tell the workers to stay at home.'[1] The result of this naïve policy was that the Vietnamese mobilised accordingly and surrounded the following day's planned targets with concentrated air defences, leading to substantial losses en route and over the targets. 385 Thuds were lost hence the term 'cannon fodder' comes to mind and the loss of several students and fellow instructors still rankles.

I was grateful to the USAF for trusting me to carry responsibilities for their people, for offering hospitality to my family and for giving me unique professional experience. On my return to the UK I hoped to use this profitably so I was disappointed to be posted to Lightnings as a Flight Commander where I thought that my extensive strike/attack experience at Nellis would be wasted. The routine debriefing in the MOD in May 1967 was unsatisfactory because there was little interest in lessons learned from Vietnam nor in the Thud's impressive versatility. Fortunately, having arrived at Wattisham, my posting was changed and I was assigned to the OR branch on the AFVG project where my experience would have been useful; but the French withdrew a few weeks later. Nevertheless, I remained in post and was detached to Munich the following year for the first meeting of the MRCA working group. This was where my Thud experience and lessons learned were put to good use and during my time in the MOD many features of the

[1] Piotrowski, General 'Pete'; *Basic Airman to General: The Secret War & Other Conflicts: Lessons in Leadership & Life* (Xlibris, 2017) p247.

MRCA were influenced by my Nellis tour. My maxim, ‘Requirements can change overnight but the hardware can’t, a plea for flexibility,’ ensured that Tornado could transfer from Cold War strike to the operational demands of today.

The Thud was withdrawn from Thailand by 1970 and from the USAF front line shortly afterwards, although Weasels were retained until 1979. The F-105 gave the USAF a formidable tactical strike aircraft for the Cold War but requirements did change overnight when it assumed the conventional attack role in SE Asia. Those who flew the Thud over the Red River Valley against very hostile air defences fulfilled their military duties in the face of a hostile public at home and at the behest of politicians in Washington who had lost their way. Intensive combat operations against a determined and well-equipped enemy taught the USAF many lessons which influenced their future policies for equipment and concepts of operation. Being on exchange meant that we shared some of these lessons which we were able to apply selectively to future RAF requirements and procedures. I learned much personally and, in turn, I hope to have contributed something to the USAF. Despite the politics, I was privileged to have served at Nellis and to have flown the Thunderchief.

F-117A – THE NIGHTHAWK
Knights, Nights, Fighter Pilots and Families

Air Cdre Lincoln Taylor

Linc Taylor joined the RAF in 1990. He flew the Harrier with Nos 3(F) and 20(R) Sqns, becoming an EWI and QWI. Following an exchange tour on the F-117A, he was involved in bringing the Typhoon into service and with Future Combat Air Capability, before being appointed as OC 20(R) Sqn in 2007. Since then, his appointments have included command of the Development Division within the Air Warfare Centre and Senior Responsible Owner, charged with leading the UK's F-35, Typhoon, Airseeker and FCAS programmes. His current appointment is as the first Head of the RAF's Rapid Capabilities Office.

Introduction

Summer 1999, we were hiking in Scotland with family and friends; we had been waiting for months for my 'deskie' to phone to let me know whether I had been successful in my ambition to join the USAF on an F-16 exchange tour. We had reached the top of a mountain when my brick-like Nokia began to ping, incessantly – hearts leapt. I sought a degree of privacy on the top of the mountain, and rang my desk officer back. My side of the conversation ran:

'Oh!' [*silence*] 'What?' 'Where?' 'F-117A?' 'Where [*again*]?' 'When?'. 'Yes, of course, I'd be delighted. Thank you!' 'No, you're right. I should ask her too . . .'

Just three months later we arrived in El Paso, Texas. Met by the wife of my predecessor, we drove the 90 miles north towards Alamogordo, New Mexico. Railroads, roadrunners and 2 metre-high tumbleweed crossing the dusty roads – think *Young Guns* and Wile E Coyote. Then, a question I will never forget, 'Where the heck have you brought me this time?!'

In the following pages, I will touch on the exchange, the jet, the tour and, most importantly, the people.

The Exchange

The F-117A exchange, created just a few years into the, then still

‘Black’, programme, was purportedly established due to the close relationship between the US and UK under Ronald Reagan and Margaret Thatcher. The first exchange officer, Graham Wardell, who gained his ‘Bandit’ (*the name afforded to all F-117A pilots*) status in 1988. The programme was originally founded under the 4450th Tactical Group at Tonopah, Nevada, before moving to Holloman Air Force Base (AFB), New Mexico in 1992.

Flying suit patch for the 7th CTS, the ‘Screamin Demons’.

Holloman sits in the high-desert of central southern New Mexico, its nearest cities being El Paso, 90 miles south, and Albuquerque a 5-hour drive to the north. The local town, Alamogordo, is known for its proximity to the 1945 Trinity atomic test site and, at the time, not a lot else, although the area has been inhabited for around 11,000 years. Alamogordo – a ‘one-horse town, without the horse’ – boasts the annual attraction of the Rattlesnake Round-Up. Nonetheless, it was beautiful; in the Tularosa basin, surrounded by the Sacramento Mountains and White Sands National Monument, the climate, mountains, sunrises and sunsets were simply spectacular.

The town enjoyed both a Walmart and a ‘Sonic’ burger bar, a number of exceptional Mexican cafes (seemingly in folks’ living rooms) and a good-enough golf course although, shortly before we left, we were treated to a new Chilli’s restaurant as well. Still, it became home for us; we lived a golf ball’s throw from the 3rd Green, surrounded by retirees, USAF – and Germans! When the Tornado Tri-National Training Establishment at RAF Cottesmore closed, the German Air Force moved their people and facilities to Holloman, bringing funding, families and *Weissbier* to the desert.

The tour began with a 4-6 month handover with one’s predecessor. It started with the 7th Combat Training Squadron (CTS) and, once converted to type, you joined the 9th Fighter Squadron, ‘The Flying Knights’. Only when fully combat-ready did one formally take-over the appointment. Night-one, or more accurately, morning-two at Holloman, was a challenge. In what was evidently something of a tradition in welcoming a replacement, Al and Sandy Monkman cooked finest Mexican, served with a gallon of Margarita. It was a fantastic welcome

to the desert – until the farewell – 'I'll pick you up at 0700. You're in the centrifuge first thing!' Still, what goes around comes around.

Centrifuge complete, in a class of four, we started academics before entering the simulator phase in preparation for our first flight in the F-117A. Under USAF rules, we all had to complete 'landing currency' before flying single-seat. So, a swift refresher on the T-38 Talon, and out for two sorties to check our flying competence. So, with the IP (Instructor Pilot) in the boot, I sat in the T-38; after a tortuously-slow set of checks, we set off down the runway. The jet was a dream, fast, nimble with a remarkable roll-rate. A few aeros, stalls and instrument patterns later we broke into the visual circuit – and that's when it started to go a little awry. Coming from the Harrier, I pointed the jet at where I wanted to land; a few feet above the tarmac. I gently closed the throttle, only to feel the stick coming back, the afterburners light and – 'I have control', from the back seat, followed by, 'Shall we try that again?' 'Sure.' I thought that I must have missed the approach speed, or – something? Same thing happened next time around – 'Are you tryin' to kill us?! Don't you remember anything?' Good QWI technique coming from the back-seat! I decided to remind the IP that 'remembering' how to land might be a tad tricky, since it was, after all, my first time in a T-38. That produced a bit of a silence then, 'Oh! Do you guys fly something else in training?' So, after a flawless demo from the IP, I had enough of a picture to attempt a slightly safer landing.

The 7th TS was excellent. As a class we progressed quickly, the Black Jet was fabulous to operate (more later) and soon enough, we graduated. In proper USAF tradition, families were invited into the squadron to look around the jet and, in a brilliant ceremony, we were awarded our Bandit 'coins', each inscribed with our (individual sequential) Bandit Number and sent to the Op Squadron. I was privileged to have become the sixth RAF F-117A exchange officer, following in the footsteps of Graham Wardell, Chris Topham, Ian Wood, Mark Sutton and Al Monkman.

The individually numbered 'coin' awarded to F-117A pilots on qualification.

One of Holloman's F-117As delivering two GBU-10s. (USAF)

The F-117A Nighthawk (Stinkbug)

Developed originally under a Defense Advanced Research Projects Agency (DARPA) program, the F-117A had its origins in academic papers published in the Soviet Union. These papers had suggested that it was possible to determine the accurate radar reflections of a shape, almost independent of its size. The Research and Development 'Have Blue' programme, in the late 1970s, proved these theories to be correct, leading to the decision by the US Government to contract Lockheed Martin to build the F-117A in 1978. Just three years later, the first jet made its maiden flight, but the existence of the F-117A remained cloaked in secrecy until acknowledgement of the programme in 1988.

That a fleet of aircraft could be developed so quickly, and in such secrecy, remains a remarkable accomplishment. The aircraft was, to a large extent, built from parts of other aircraft, re-engineered to fit inside a low-observable outer skin. The F-117A incorporated: a pair of non-afterburning engines from the F/A-18; a quadruple-redundant F-16 flight control system; F-15 undercarriage; a brake chute and navigation systems from the B-52, and elements of an F/A-18 cockpit. It has two internal weapons bays with the ordnance carried on trapezes, each bay being large enough to house the purposely-designed GBU-27 (2,000lb penetrator bomb). Our routine loadouts were GBU-10s, GBU-12s or GBU -27s.

Features such as the famous slit exhausts, intake grills and the faceted shape, all contribute to maintaining as low a signature as possible. What surprised me most, especially coming from the Harrier, was the sheer size of the F-117A. With a maximum take-off weight of more than 52,000 lbs, it was possible to walk under the aircraft to do pre-flight checks. I recall my surprise at looking *down* into the cockpit of a German Tornado when I parked alongside one while waiting to take off at Holloman – a view I had never seen from the mighty Harrier!

That said, despite being heavier than a fully-laden Tornado, we had little more thrust than a Jaguar in burner. So, in the high New Mexico Desert, with 40°+ temperatures and at a pressure altitude of 4,000 ft, we had need of a couple of *long* runways – 12,000 ft and 15,000 ft did the trick – just!

Handling-wise, the jet, true to its inherited F-16 flight-controls, 'thought' it was a fighter – albeit a bit wheezy in the thrust department. It was reasonably agile to fly, with a surprisingly crisp response. Getting up to ramming speed took a while, but once there, it was relatively frugal on gas, and there was very little drag because everything, including all fuel and stores, was internal. This could create a bit of a problem when trying to join a formation – the lack of speed-brakes and a very slippery jet meant that, 'Number Two has the lead' was not an uncommon call! Still, a bit of cross-controlling, using the twin fins in a more novel sense, could slow the aeroplane down a bit. Unsurprisingly, the view was a little constrained under a huge electrically operated metal/glass canopy but, since most of our flying was at night, that made relatively little difference. The fly-by-wire controls and cockpit design meant that it was very quiet – almost no sense of speed, very little noise and with handling reasonably consistent throughout the envelope.

We would typically fly high-subsonic speeds (sonic booms would be detectable) at medium to high altitudes, but would come down to meet the tankers. Refuelling was relatively simple, both from the KC-10 and the KC-135. Compared to the probe-and-drogue system favoured by the UK, the boom was easier to 'plug' (the boomer did most of the work), but maintaining references underneath the belly of a tanker (inevitably in the middle of the night) took more concentration than utilising a hose and drogue system.

In mission systems terms, the avionics of the jet were exceptional; I vividly recall one of the sorties on the OCU where you would position

The F-117A cockpit – 'the avionics of the jet were exceptional'.

yourself behind another lead F-117A – 500 ft down and in ½ nm trail – both pilots would engage the autopilot at the same time and fly a complex route around New Mexico, Arizona and Colorado. An hour and a half later, without either pilot having touched their controls, and having 'hit' a dozen simulated targets, you were in exactly the same formation as you started.

The avionics, upgraded in the '90s with a new Head Up Display, targeting display, two colour displays and an up-front controller, offered brilliant mission-effectiveness. The main targeting sensors were the FLIR and DLIR, (Forward/Downwards-Looking Infra-Red). Coming from seasoned TIALD-pod use on the Harrier, weapons employment on the Stinkbug initially appeared more difficult. In the run-up to a target, my training of 'big to small' features would kick in. That worked, up to a point, but I was often left searching for the precise DPI (weapon Desired Point of Impact). Only when closer to the target, would it dawn on me that the reason that I had been unable to see it was that the target had been obscured by the cross-hairs of the targeting

system! So, the trick was to sit on your hands for a while. Later, once on the operational squadron, we would turn various parts of the system off, simulating failures and degradations just to hone our skills – then it was just like being back in the Harrier!

Navigation was provided by a ring-laser gyro and GPS. Such was the accuracy and effectiveness of the system that the monthly 'Top-Gun' competition would be won only by those who had 'hit' 100% of their 60-100 targets that month. Final determination of the winner was decided by time-on-target accuracy, averaged out. It is no exaggeration to say that, with an average of more than one second, you probably wouldn't win that month!

Flying suit patch for the 9th FS, 'The Flying Knights'. The rich scarlet and blue background loses a certain something in B&W

As part of the conversion to the jet, and for regular check rides, the F-117A would be 'shadowed' by an instructor in a T-38. Like my predecessors, I was fortunate to, not only become an Instructor Pilot (IP); I also took my Standards/Evaluation Flight Examiner (SEFE) qualification. That meant that I would typically double my flight time per month and that I got to fly in the daylight a little more! The T-38 was also used to build experience in operating from unfamiliar fields and areas – so weekend 'rangers' or 'cross-countrys' became commonplace.

Operating the F-117A from Holloman

In addition to the 7th Combat Training Squadron (The Bunyaps), Holloman AFB was home to two operational squadrons – the 8th Fighter Squadron (The Black Sheep) and the 9th Fighter Squadron (The Flying Knights). The Brit exchange was always assigned to the 9th FS, while the 8th was host to the US Navy exchange officer. Despite the banter, the squadrons got along excellently, each supporting the other in training and in any build-up to operations. The two squadrons would take it in turn to hold immediate readiness for global deployment, which we both practised and undertook regularly. The operational squadrons shared the 'Canyon' on the western side of Holloman, a series of

Holloman's 'Canyon', of individual aircraft shelters. (USAF)

individual aircraft shelters, each housing a single F-117A plus weapons, fuel and maintenance equipment. Similarly, the 8th FS and 9th FS shared the two halves of a common operations building. Each squadron had about 30-35 pilots directly assigned, or attached from the wing, plus maintainers, ops, support and mission planning personnel. Our squadron camaraderie was exceptional; mirroring what we had been used to on RAF squadrons. The only perceptible difference was the presence of 'Martians' (the maintainers specializing in the upkeep of the low-observable surface of the aircraft) and dedicated crew chiefs. The latter were specialists on their (and I use that possessive term deliberately) aircraft, and would diagnose and rectify snags on their personal jet with astonishing efficiency.

For the majority of the year, a typical day would consist of a day wave and a night wave, the former launching mid-late afternoon lasting for a few hours and then the night wave would launch well into the night, recovering in the early hours. T-38 currency sorties and instrument ratings were all conducted in daylight, although combat-ready and mission check rides were almost all conducted after dark. The only exceptions to the above were during the 'monsoon' season when, around midday, every day, the most spectacular seasonal storms would form around the Tularosa Basin; at those times early and late morning waves were flown.

A typical day would comprise turning up just in time to take the

mission brief – turn up too early and you might be out of crew-duty time for the last wave if the chance of a second sortie became available. Then, as a 12-ship formation, we would receive the mass-brief mission scenario and plan. We normally operated as pairs, or fours, so, after the mass brief, we would split down to our sub-formations. Following the formation launch, we might hit the tanker (they needed to maintain F-117A currency too) before splitting to individual routes, each of us simulating attacking up to a dozen en-route targets before all twelve aircraft converged for a simultaneous co-ordinated attack on the range. Notwithstanding normally being glued to your screens on a target run, if all was going well, it was worth sneaking a peek outside just to see the twelve jets arriving from different directions to hit the same target complex at exactly the same time – brilliant!

The remainder of the day would comprise debrief and admin, unless one was lucky enough to get on the second wave as well. Any T-38 sorties would be flown in the morning/afternoon. Typically, we would average around 8-10 sorties per month with T-38 flying on top of that. Mission planning lead (with dedicated training aims) was shared amongst all squadron pilots. Each pilot would usually hold that responsibility for a week, planning, coordinating and briefing all of the squadron sorties flown.

To become familiar with the USAF system, the Brit exchange officer would typically spend 2-3 months being responsible for scheduling, which provided the necessary insight into how the Americans worked and how activities were coordinated within the Wing. With that milestone passed, we would be appointed to command of one of the Squadron's three flights. During this time, I also undertook IP training, as well as instructor conversion onto the T-38. Then, for the final year or so, we typically undertook Assistant Director of Operation (ADO) roles, responsible for the effective operational output of the Squadron. It was during this time that I was trained as a SEFE as well as IP – more T-38 and F-117A flying, but with it, more paperwork!

The opportunity for cross-country flights was certainly welcome, but the rules required that one had to train and fly the aircraft more than if they were at home. We often flew a 4-ship of T-38s on a Friday afternoon, heading either east or west. Friday nights at other Air Force Bases, like Randolph, Tinker, Edwards, Nellis, Patrick and Eglin, became familiar stops. There would be another couple of sorties on the

One of Holloman's 'stealthy' black T-38s.

Saturday, a well-earned night/day off on Sunday, before returning the jets via a 2-3 stage trip on the Monday. It was a great way to spend the weekend, brush up on navigating around a very extensive country, and finding a decent night-stop in the process. Key West and San Francisco were a couple of my favourites.

Understandably, both at Holloman and away, security was tight around the F-117A. We shared much in common with the B-2 Force and often stopped in at Whiteman AFB, albeit Knob Noster, Missouri didn't have much that we didn't have in Alamogordo! Throughout my tour, I was effectively treated as a USAF officer, albeit one with a strange accent, an unusual take on the English language (!) and questionable spelling. This was a real mark of respect between our two Services that continues to grow and pay dividends. Indeed, subject to the Embassy's approval, we were to be treated in exactly the same way as the USAF in our immediate readiness to deploy.

The F-117A was considered very much as a national asset; as such it was important to showcase the aircraft at home and occasionally overseas. In the latter case, I had the exceptional privilege of bringing a couple of jets across the Atlantic to participate in the Royal

One of the pair of F-117As that participated in RIAT 2002 getting airborne from Fairford. (James Goggin)

International Air Tattoo on two occasions – at Cottesmore in 2001 and at Fairford in 2002. These trips presented great opportunities to showcase the aeroplane's remarkable capability and to repay some of the kindness my colleagues had extended to me, since I was able to show the detachment some of the UK's historic sites – and the occasional pint of decent beer.

In the summer of 2001, we deployed a number of F-117As to Wright-Patterson AFB, to support northern US air shows. One day, I launched to support an event, a short hop to the west. They appeared somewhat surprised to hear me bell up on the radio. 'Not the first time,' I thought – 'It's the British accent.' After a brilliantly-executed flypast, I headed back to Wright-Patt and gave them a quick call, just to check that all had been good. 'Sure,' came the reply, 'but you kinda had us, by turning up exactly an hour early!' What sort of country puts time-zones in the *middle* of their landmass?! I seem to recall that that cost me a round or two!

The People

Although our closest ally, and speaking broadly the same language, we knew that moving to live in the US meant that things would be different. But we had never imagined how similar USAF personnel and their families would be to those we were familiar with in the RAF. To fly the Nighthawk, pilots must have accrued 1,000 hrs of 'fighter time', so the make-up of the squadron was 'mature' around 80% of the pilots were lieutenant colonels or majors with only a few captains. We had a real mix of experience, F-15C and E, F-111, F-16, A-10 and T-38, but

the ethos of the Nighthawk, and what it was there to do, pervaded the culture. There was a work-hard, play-hard atmosphere that, in essence, was little different from being on the front-line in the RAF. The welcome we received as a family was exceptional. We were taken into the fold as the 'next Brit', as if all six of us had ourselves come from the same family; indeed, the friends we made in the US will stay with us throughout our lives.

On a couple of occasions I was invited to be a guest at the 'River Rats Convention' (the Red River Valley Fighter Pilots' Association). On one such reunion, in Atlanta, I had the privilege of stepping in to represent Lt Col Bob Pardo for one of the Games/Challenges (famous for 'Pardo's Push' during the Vietnam War for which he was subsequently awarded the Silver Star). Throughout my tour, the same fighter-pilot mentality that we know in the RAF was evident. I would offer one observation, however, which is that the USAF appears to pay far more attention to the welfare and care of its veterans than we do in the UK – one for us to reflect on going forwards.

On a similar theme, as the Brits in the US, it was only right that we should introduce the Wing to the traditions of the Royal Air Force. Each September, we invited 250 or so Wing personnel and their spouses to our home to celebrate the Battle of Britain. Armed with a flagpole, an RAF ensign, food, beverages and the essential city-authorized noise permit, we would recount the story of the Battle and how it likely stopped Hitler's invasion of Great Britain due to the *Luftwaffe's* failure to achieve air superiority. Interestingly, on both Battle of Britain Celebrations, we were gate-crashed by the German Tornado crews, who arrived late in the evening, arms laden with *Weissbier*, claiming that they too should celebrate the Battle of Britain, after all, 'they came a close second!'

In the summer of 2002, I had yet another privilege; I led a team of USAF personnel on the annual Bataan Memorial Death March. We entered in the 'military heavy' category and so, laden with packs, we started the 26-mile march through the desert. Just when the sun, sand and weight started to take their toll, we met the real veterans who were manning water-points around the latter part of the route. It was incredibly motivating, and moving, to meet people who had done it for real – force-marched by the Japanese, carrying, not packs, but their comrades, for over 60 miles.

In 2002, Linc (on the left, sporting a union flag) led a USAF team on the annual Bataan Memorial Death March.

Some of our greatest friends are among those that we served with in the USA; the remoteness of Holloman and Alamogordo meant that the social life was exceptional – we had fabulous times at friends' houses, on tour around the State, the Gila Wilderness, skiing at the nearby Ski Apache, and on vacation. The squadron wives, known as the 'Ladies of the Knight', were a close-knit group, which was essential, given the constant possibility of our sudden and extended deployment. Under instruction from friends, we were tasked with seeing as much of the US as we could during our time; Lindsay visited more than twenty States. Assisted on occasion by a T-38, I managed around twenty-eight. We took holidays in the Pacific Northwest, New England, California and Hawaii – all of which were very different but all remarkably beautiful. Our travels were so varied, that we inadvertently became *de-facto* tour guides for many friends on the squadron.

Unexpectedly, despite being in the US, we probably saw more of our own family and friends – no longer just a snatched weekend visit as

is often the case in the UK, but visits for a few weeks. The visitors, the high desert, the remoteness and nearby skiing, justified a couple of enormous 4-wheel drive vehicles! Our eldest, born while on tour in Germany, developed a fabulous south-western US accent. Our second child, was born while we were out in the States – she received her US passport before her British one and is very proud of her dual nationality. We will never forget the sign on the way into the maternity unit asking visitors to 'Leave their guns at the desk'!

So in summary, ***Knights, Nights, Fighter Pilots and Families*** sums up our exchange brilliantly. The 9th Fighter Squadron – the Flying Knights – its people and their families took us in as one of their own. The Service-centred support and care was there throughout and, despite being 90 miles from civilization, we never felt isolated. The outdoors, climate and opportunity was simply fabulous; whether watching the evening 'ring of fire' lightning show from our decking with a fine red, dining with friends at the 'Inn of the Mountain Gods' on Sierra Blanca, or hiking up the 'Sleeping Lady' with breakfast burritos on a clear crisp Sunday morning, it never ceased to be an absolute joy. Squadron life was fun but focussed. We knew that, if circumstances required it, we and the jets might be half-way around the world in just a couple of days. The jet itself was easy to fly, but fabulous to operate; a simply exceptional capability that could put precision weapons on target, on time, anywhere in the world – as our Bandit 'coin' describes – *'When it absolutely, positively, has to be taken out overnight'.*

The friends we have made, the memories of our friends and family that joined us on holiday and the vacations that we took will stay with us forever. Huntin', shootin' and fishin' with the squadron, taking cross-countrys in a T-38, or partaking in 'Squadron Roofstomps', it was the best of times. Families taking barbeques and beer in the spectacular setting of a sunset over White Sands, of the tastes and smells of the Hatch Chilli Festival or the sights of the Albuquerque Balloon Festival were an absolute pleasure. Golfing with friends and stopping at the 3rd Green for a beverage from the fridge, watching the kids play in the pool or a margarita in the hot tub, it was a fabulous way to work, play and live in the United States.

In all, an absolute privilege for both of us.

USMC HARRIER EXCHANGE 1976-78

by Gp Capt Bob Iveson

Bob Iveson joined the RAF in 1967. After an initial Hunter tour in Bahrain, he switched to the Harrier which he flew with No 3 Sqn, VMA-542, No 233 OCU, No 1 Sqn, the latter including operating from HMS Hermes *(and being shot down) during the Falklands War and finally as Air Commander, British Forces Belize. He subsequently converted to the Tornado, and, as OC 617 Sqn, earned an AFC in Gulf War I. Ground tours included: appointments at the MOD and HQ 1 Gp; Director of Initial Officer Training and Assistant Commandant at the RAF College, Cranwell; and Assistant Air Attaché, Washington DC. He retired from the Service in 1999.*

In 1976, I was absolutely delighted to be posted, on exchange, to the United States to fly their version of the Harrier out of Marine Corps Air Station Cherry Point on the beautiful North Carolina coast. As an ardent fisherman, it was the perfect place to go.

The appointment was to be for two years, plus training. Unfortunately, when the exchange is in that direction, the time allowed for training is only two weeks, and much of the first of those is taken up with domestic issues, like sorting out your accommodation and transport. When my wife and I stepped off the little commuter airliner at New Bern airport, we were amazed at the welcome – about a third of the squadron's pilots, and a lot of the wives, had turned out to meet us. They whisked us straight back to Cherry Point and took us to our married quarter. It was a nice little bungalow, on the base. Marine Corps married quarters are completely unfurnished – not even carpets or curtains – but the squadron had begged, borrowed, stolen and nicked from BOQs sufficient furniture and curtains to give us the basics so that we could move straight in. They also handed me the keys to a car and said, 'Please feel free to use it for as long as you need until you buy your own.' It was an amazing welcome. It was some weeks before I realised that the pilot who had so generously loaned us his car had no idea that he had done so – he was on a lengthy deployment to WESTPAC[1] and had left his keys in the Ready Room!

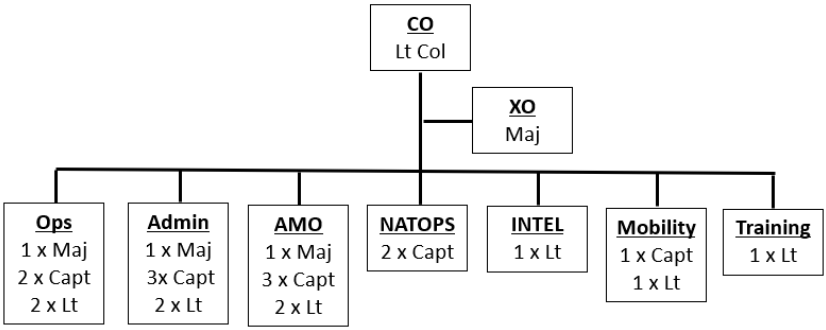


Fig 1. Internal organisation of a Marine Corps attack squadron.

Cherry Point is a huge base, surrounded by a massive training area – not only out over the sea, but inland as well – and free-firing. The first thing that struck me when I actually got to work was the squadron's organisational structure, which was completely different to an RAF unit. At the time, Marine Corps squadrons were, and probably still are, virtually autonomous, but there were no dedicated specialist officers. Everything – engineering, administration, intelligence, etc – was done by pilots. Even the equivalent of an RAF SEngO, the Air Maintenance Officer (AMO) and his subordinates, were pilots.

The squadron had sixteen aircraft and twenty-four pilots who carried out all of the functions at Figure 1. It was a totally different atmosphere compared to an RAF squadron. Apart from those working in Ops, everyone had, what amounted to, a full-time day job, that *didn't* involve flying.

Another thing that struck me was the experience level on the squadron. Mine was the first front-line exchange tour on the Harrier. My predecessors had both been assigned to the Harrier training squadron, VMAT-203, as QFIs, whereas I was to be a QWI on an operational unit, VMA-542, 'The Tigers'. But the experience level on the squadron was remarkably low. Having been obliged to extend my time in Germany, while 'Hoof' Proudfoot

VMA-542 – 'The Tigers'

engineered an extension to his exchange tour, I had about 800 hours on the Harrier by the time that I arrived in the USA. But apart from Terry Mattke, who had recently completed an exchange tour with the RAF and had some 500 Harrier hours in his log book, the next highest total was about 150 and the vast majority of the squadron were closer to the 100-hour mark. As a result, rather than treating me as the new boy on the block, they tended to regard me as the resident expert. That was fine, in the context of flying and operating the aeroplane, but led them to assume that I knew an awful lot more than I did about flying in the States. The airspace in the immediate vicinity of Cherry Point was pretty much an unrestricted military flying training area – but beyond that different, and formal, rules applied.

Instrument flying training and an IRT had to be completed in a day and the 'written' exam was done as a multi-choice 'tick test'. But this was a somewhat academic exercise, because the squadron had a template – you just put a tick in all the holes and you got 100%! The prevailing rationale was that, 'We just do that to complete the paperwork, then we'll tell you what you need to know.' As it turned out, they didn't actually *always* remember to tell me *all* the things that I needed to know . . .

For example, my first sortie outside our training airspace was in about Week Two, when I was sent down to Myrtle Beach to get used to flying in airways, which we often used when transiting across the States. I was very concerned about joining and leaving US controlled airspace and got a very thorough brief, but nobody mentioned the rules about flying below 10,000 ft in clear airspace where there are issues like a 250 kts speed limit. I approached Myrtle Beach VFR at 500 kts, which they found a little 'surprising'. That said, I did slow down to, what was legal at Cherry Point, 450 kts to break into the circuit – which was *not* the case at Myrtle Beach . . . Then of course, I capped it all by doing the usual Harrier arrival with a bit of dancing about, a bow and a mini circuit. That attracted two more flight violations to add to my initial speed violation. So – not a great start!

Moving on to the squadron's functions. The primary role was ground attack, but the tactics used by the Marine Corps were very much medium level orientated. So transits were routinely flown at high level, then down to medium level, only actually descending to low level if required for weapon release. However, shortly before I arrived,

An AV-8A of VMA-542 with a tiger-striped rudder.

VMA-542 had been reassigned from WESTPAC to the ACE Mobile Force and they had, recently sent a team across to Europe to observe the way in which the RAF Germany Harrier Force operated. They had concluded that they needed to get heavily into low level operations, and that was to be my role as the squadron LATTI – the Low Altitude Tactical Training Instructor. I was to be assisted in this endeavour by Terry Mattke. First off, we had to draw up a low altitude training programme. Once this was underway, I was invited to write a related chapter for the Tac Manual, which I did and the OpsO, who was my immediate Boss, translated it into American.

The group of Marines who had visited RAF Germany, several of whom were from VMA-542, had arrived back at pretty much the same time as I joined the squadron. They had been much amused by Germany-based RAF Harrier pilots referring to each other as 'Shag' – 'Gash Shag', 'Duty Shag', whatever. They thought this was tremendously funny so, no prizes for guessing what became my individual callsign for the next two-and-a-half years! Although, it wasn't actually any less subtle than the squadron's callsign, which was 'Lusty'.

On to air defence. Notionally our secondary role, it was actually taken much more seriously – probably because it was more fun. Unlike the RAF's Harriers, the USMC's AV-8As were armed with the AIM-9 Sidewinder, which was very useful, and we did a lot of dissimilar air combat training. This included exercising with the USAF's Aggressor Squadron who were interested in dealing with some of the more

extreme manoeuvres that the Harrier could do. Having established a liaison, one of the Marine Harrier squadrons would sometimes be invited to join the Aggressors when they were providing an OPEVAL for USAF air defence units. My first trip away with them in this role was great fun. We took four Harriers down to Key West; the Aggressors were flying out of Patrick Air Force Base on Cocoa Beach and we were evaluating an F-4 unit flying out of the Florida panhandle. Tremendous flying in the daytime and, of course, it was no hardship to be based at Key West for about ten days.

Next up was air-to-air refuelling. The Marine Corps' tanker was the C-130, which did present some problems when crossing the States. The maximum height we could refuel from the C-130 was about 20,000 ft. Any higher and their maximum speed got to be the wrong side of our minimum speed and everything could get a bit tense. Because of the difference in cruising speeds, we didn't have the luxury of accompanying the tanker as you flew from one coast to the other – you had to rendezvous with him, invariably somewhere in the clouds – which was another complication arising from being limited to 20,000 ft. So, you had to find your tanker, before you could refuel and, if you were carrying heavy weapons, which we sometimes were, this could add another complication, because the weight meant that the Harrier was flying at a significant angle of attack, which meant that the probe was misaligned with the axis of the basket, which involved some jousting and could be a bit alarming. But good sport overall.

We also had to maintain carrier qualification. This didn't involve the Navy's big carriers; we used LPHs – helicopter carriers – small, single-screw, round-bottomed boats. We did not do deployments, however; the Marines had no wish to spend their nights at sea if they didn't have to. So 'carrier quals' were normally done while the ship was transiting along the Carolina coast and the aircraft flew on and off each day.

Day carrier qualification was not a major problem. The only slight difficulty was on take off. There was no ski-jump so, as you went over the front of the deck, there was a huge pitch-up, caused by the disturbed airflow over the bow. As you went over the end of the deck you automatically slammed the stick forward to virtually touch the instrument panel and then, a second later, or less, you climbed away.

At night this is a totally different experience, because you are out at sea, on a black night, no stars – absolutely no visual cues – *nothing*.

The USS Guam, LPH-9, with a Harrier alongside and others on deck.

You are coming off the front of the ship into a black hole at which point you are supposed to shove the stick straight at the instrument panel – and I can assure you that, psychologically, this is not possible! The briefed procedure was to take off, turn downwind at 800 ft and do a couple of overshoots to get used to the Fresnel lens optical landing system (FLOLS) and, when you are ready, hover alongside and land-on on your given spot on the deck. I was one of the *lowest* to turn downwind and I was at 3,500 ft by the time that I had recovered from that pitch-up on the take off! So – day carrier quals – interesting, a lot of fun. Night carrier quals – I'd rather be in the bar . . .

The other type of flying I was very lucky to do during my USMC tour was air shows. Unusually, for an exchange officer, and due partly to the lack of experience on the squadron, but also partly to the number

of crashes they had had in the recent past, I was selected, along with Terry Mattke, as one of squadron's two demonstration pilots. It really was a licence to steal. Interestingly, the Marines did not appear to have any rules about minimum heights and the like for air shows and flying demonstrations. Along with Terry, I was simply told to take an aircraft to Bogue Field – an auxiliary landing ground on the coast about 12 miles south west of Cherry Point – and work-up a suitable display. This we did, critiquing each other's efforts, until we had something that looked suitably startling and invited the colonel to come and have a look. He said, 'Yep; that's fine,' and two weeks later we were sent off to our first air show. It was at Detroit Municipal Airport. Before departure I enquired about the regulations – what are the minimums? what are the rules? what are the standard operating limits? Apparently, there weren't any, but we were advised that, on arrival, we would be briefed by an FAA representative who would explain the local constraints. We would have to sign as having understood those and we would then 'be legal'. That happened, as forecast, but it was clear that the FAA's priority wasn't preventing a crash; so much as ensuring that, if you did crash, you didn't hit the crowd. Most of the rules were to do with separation from the crowd-line – so many yards if you were straight and level, more if you were rolling and more still if you were doing a looping manoeuvre; there were also some limits on timing, etc.

US air shows are, fundamentally, commercial ventures. The vast majority, and there are hundreds of them – many more than we could provide a Harrier for – are run to make money and they are normally sponsored by organisations like the local Chamber of Commerce. It is a very expensive business with a small show by three little biplanes, like the Red Devils, costing between $10,000 and $20,000 – that said, they did put on a fantastic display. But, if you could get one, a Harrier came free of charge, paid for by the military, so there was huge competition. After each show we had to write an 'After Action Report', composed in terms of Marine Corps recruiting opportunities and effectiveness of Marine Public Relations, because that was the justification for our participation. The wise amongst the air show organisers soon cottoned-on that the better they looked after the pilots, the more positive would be their After Action Reports and the more likely they would be to get a Harrier next time. As a result, we were treated like royalty with five-star hotels and chauffeur-driven cars.

A pair of USMC AV-8A Harriers.

Somewhat of a contrast to my experience of demonstrating a Harrier in the UK!

What of the 'challenges'? The greatest concern during my time at Cherry Point was political. It was still fairly early days for the Harrier with the Marine Corps and they had experienced a very high loss rate. This had led the US defence industry to accuse the UK of selling them a dangerous pup which wasn't fit to fly and was going to kill 'em all. As the man on the spot, I was hauled up to Washington several times. Twice I had to brief the Ambassador himself and explain why the Americans were having such a high loss rate. I considered that there were four contributory causes.

First, the Marines were not selecting pilots for the Harrier on the basis of appropriate aptitude and/or previous operating experience. Instead, the Marines have a tendency to believe that they can do anything, so VMA-542 had pilots who had previously flown C-130s and the A-6, which was more of a bomber than a fighter, and a lot of ex-helicopter pilots.

Secondly, the conversion course was a bit shorter than ours and there was a lack of TAV-8As – the two-seat 'T-birds'. They had them on the training squadron, of course, but there were none on the front line units. When a new pilot first joined a squadron he still had an awful lot to

learn, but there were no more dual rides or check rides. Everything that needed checking was done by a chase pilot, rather than in a T-bird.

They also had a problem with flying hours. Because of the serviceability of the aircraft, Marine Corps squadrons were put under enormous pressure if they weren't making enough flying hours and hitting their targets. This had gradually led them to adopt a policy of weekend rangers and on most Friday afternoons the squadron would send two, sometimes four, aircraft away, to fly on Saturday and come back on Monday morning. They called it 'navigation training', but it was really just a means of racking up flying hours, while swanning around to parties all over the States. Great fun, of course, but it meant that four aircraft would arrive back on Monday carrying a list of snags requiring rectification, which ate into productive training flying during the week.

My final observation concerned the way in which the USMC organised its squadrons. As illustrated by Figure 1, the unit was run exclusively by its pilots and a lot of their tasks on the ground were both demanding and time-consuming. As a result, too many officers were obliged to regard maintenance or admin as their first priority with flying, in effect, relegated to being a secondary duty.

That said, I do have to mention the attitude of the Marine officers, which was, to me, the Corps biggest asset – their aggressive, can-do approach. US Marines are very reluctant to say, 'I'm sorry; I think that may be a bit beyond me.' That simply is not the Marine way and, while it is exactly what you want on a fighter squadron at war, it could sometimes lead them into a spot of bother in peacetime.

There was one other issue that is worth mentioning – security – because it could sometime cause complications. The problem was the American SECRET NOFORN classification. It was of no consequence on the squadron, where I was fully accepted. Besides which, since being assigned to the ACE Mobile Force, everything was classified NATO SECRET, which trumped the over-stamped SECRET NOFORN. In any case, the IntO needed me to interpret all the in-coming signals that arrived in NATO-speak, so it just wasn't a problem.

We did, however, have a problem at the Tac Manual Conference. When you write a new chapter, before it is actually rolled out to the Harrier Force, it has to be vetted and amended if/as necessary. This is done at one of the periodic Conferences held at China Lake, a Navy

An AV-8A of VMA-542. (Steve Ryle).

research centre. We flew there, from Los Angeles International Airport, in one of Sunshine Airways' little Twin Otters. When we landed, we were informed that, because the aircraft had been full, our luggage had been left behind, but that it would come on the next flight. So we attended the morning session of the Conference in civvies, which went off without a hitch. Our baggage arrived as forecast, so we changed into uniform for the afternoon session, which actually contained the low altitude chapter, which was my responsibility. But now that I was in uniform, they wouldn't let me in! After a major discussion with the USN security people, the Boss finally persuaded them to admit me while the chapter that I had written was being discussed. But I was then obliged to leave, despite the fact that I had, of course, signed as having read the whole manual! Bit frustrating really.

Security cropped up again in the context of Top Gun. Towards the end of my tour, the squadron was tasked to send, what I believe was going to be, the first four Harriers to the Navy's Top Gun programme at Miramar. The OpsO, myself and two others were working up to go down there when we were advised that Miramar would not accept my security clearance. So I lost that one, which was a shame, because it was only a few years before the Tom Cruise movie came out, which would have given me good bragging rights in the bar.

Finally, my plot for extending my tour was to be based on a WESTPAC deployment. The squadron was due to mount a half-squadron deployment to Japan, about two weeks after I was due to leave

the squadron. They wanted me to go with them and I tried to get permission. There was a potential problem to do with security clearance, but I think we might have been able to get around that one. In the end it was the British Embassy that turned me down as, apparently, in that part of the world, our foreign policies were not sufficiently aligned.

The upshot was that, my failure to get to WESTPAC, meant that I no longer had an argument for extending my tour, so I had to go back to the UK.

Finally, in closing, a word about the overall experience from a personal point of view. It was a most enjoyable family tour. Not least because of the financial advantages. My pay was more or less twice what it would have been in the UK. You may recall that, in the mid-‘70s, a junior officer with a wife and two children was actually struggling a bit. But in the States, I was able to buy about half an acre of Pontiac, a nice boat and a motor bike. Later on, we borrowed a camper van from a Marine colleague and had wonderful trips all around the south of the States. On two of the expeditions when we took the camper van, I was able to combine a holiday with attendance at the annual Exchange Officer Conference at Maxwell AFB.

So – memories? Very fond. A wonderful tour. Huge amount of respect in both directions. I learned an awful lot about how things could be done in different ways and I came back with an everlasting deep respect for the United States Marine Corps.

[1] WESTPAC – literally Western Pacific, a regional command that controlled, at the time, USN/USMC units afloat and shore-based in Japan and the Philippines.

SLUF – SHORT LITTLE UGLY FELLOW OR 600 HOURS ON THE A-7D CORSAIR II

by Air Cdre John Lumsden

John Lumsden joined the RAF via Cranwell in 1959. His early flying career involved Hunters with No 20 Sqn and No 229 OCU and as a QFI on Jet Provosts. A USAF exchange on A-7s, 1971-73, was followed by trials work on the Jaguar at the A&AEE, a tour with No 6 Sqn and command of No 226 OCU. Having formed the Tornado OEU, he was then Station Commander at Lossiemouth 1986-88 before being appointed Commandant of CTTO and EWOSE which were eventually merged with several other units to create the Air Warfare Centre which he commanded until retirement in 1996. Post the RAF, he worked for GEC-Marconi and the Selex Division of Finmeccanica.

Introduction

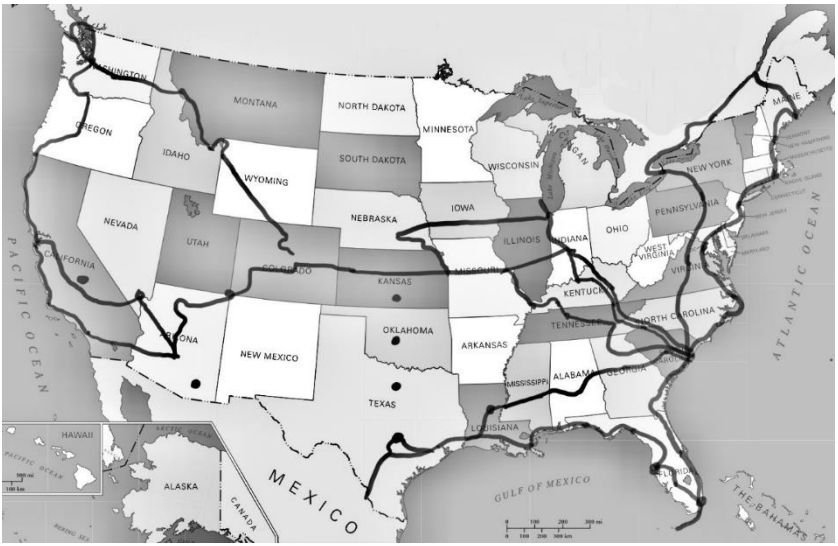
I had the privilege of flying the SLUF – Short Little Ugly Fellow (as opposed to the B-52 the BUFF Big Ugly Fat Fellow) or the Ling-Temco-Vought A-7D Corsair II to give it its proper name – at Myrtle Beach in South Carolina from January 1971 to June 1973. I was a founder member of only the second squadron get the SLUF, so we were all on the same course at Luke AFB.

The Lumsdens

I was a flight lieutenant, just 30, with three flying tours behind me – 20 Sqn Hunters at Tengah, a QFI tour on Jet Provosts at Acklington and Hunters again as a Flight Commander with No 229 OCU at Chivenor. I had just over 2,000 hours in my logbook.

Any posting causes huge disruption for the family, of course, but moving a family of five – from Devon to South Carolina over Christmas and the New Year, with heavy snow on both sides of the Atlantic, was a real challenge. We arrived in Washington, DC on New Year's Day, 1971. After a few days sightseeing and at the Embassy we flew down to Myrtle Beach with a wad of dollars.

We were met by Lt Col Jerry Crist (the Squadron's Operations Officer) and his family. He was my sponsor; I was the first RAF



The six expeditions undertaken by the Lumsden clan and - • - sundry AFBs visited via A-7D..

exchange officer at Myrtle Beach so there was no Brit to help settle us in. Jerry and his wife had organised a quarter in Base Housing and had borrowed furniture, linen and everything else we needed (Base Housing is let unfurnished). There was even food and beer in the fridge and a baby-sitter. Anne and I went off to meet the 355th Tactical Fighter Squadron pilots and their wives – the first time the unit had got together. A fantastic start!

The reason things were so well organised was the that the 354th TFW Commander, Col Rosencrans had been the first USAF exchange at Chivenor in 1953. He had been met at the guardroom with incredulity – nobody had heard of him, or the exchange programme, and nothing had been organised. But he loved the flying and hardly travelled outside Devon, something that he had regretted ever since. His 'advice' to me was to travel as much as possible. 'If you don't, I'll order you off the base. If you want to go somewhere and you've run out of leave, I'll give you orders to go.' I did not need telling twice! Apart from extensive family expeditions all over the USA, I was encouraged to take an A-7 away for weekends, so I, and we, saw as much of the States as possible.

Historical Perspective

At the time Edward Heath was Prime Minister, Lord Carrington was Secretary of State for Defence, Sir John Grandy was CAS and Sir Denis Spotswood was AOCinC Strike. The P1154 and TSR2 had been cancelled, as had the F-111s; Buccaneers had been ordered to fill the gap. Harriers had been declared operational the year before. Denis Healey had previously announced that British troops would be withdrawn from east of Suez in 1971. RAF Tengah had already closed and FEAF disbanded at the end of the year.

The situation in the States was very different. The Vietnam War, now entering its second decade, was the longest war the US had fought. Over 53,000 servicemen had died, another 2,500 were classified as either missing-in-action or prisoners of war. Nixon, with Kissinger as his National Security Advisor and Melvin Laird as Secretary of Defense, had been elected in 1968 on the promise of achieving 'peace with honor' and ending the war. On 1 January 1971, the day we arrived in the States, there were still over 300,000 US military personnel in South Vietnam and many more, mainly USAF, in Thailand.

Even though the talk was of peace, the task of the squadron I joined was to get ready to deploy 100 days after we received our last aircraft – and that drove everything.

Myrtle Beach

You could stay for two weeks in Myrtle Beach City and play on a different Championship level Golf Course each day and not travel more than 50 miles to get there. Sadly, wasted on me, as I don't play golf! At the time, the City consisted of three parallel roads on a thin strip of land between a sixty-mile beach and the inland swamps. There were smart homes and a few hotels on the shore, shops, businesses and flats in the middle and tin shacks by the swamp. Today, it's wall-to-wall hotels and condominiums; the airfield is now a civil airport with a huge shopping complex where the base was. Civil Rights were a very live issue at the time but, as we lived on-base in a USAF cocoon, surrounded by a high wire fence and armed guards, it did not affect us. Despite this, many wives kept a loaded handgun in their bedside cabinets and the gun cabinet was the best piece of furniture in some houses; the gun culture was alien to us and uncomfortable to live with.

Everything one needed could be found on base – a shopping centre

Some Lumsdens on the 60-mile long Grand Strand.

(BX) and a well-stocked commissary (supermarket), though we had to venture out to find Marmite. There was a well-equipped hospital and each squadron had its own Flight Surgeon.

Needless to say, with the 60-mile long Grand Stand of white sand a few hundred yards from our quarter and a hot and humid summer that lasted from early January to late December, the family spent a lot of time on the beach where there was always a breeze. Social life on the squadron was good; the Americans are very hospitable and, being in at the start of a new unit, made a big difference. We made good friends and still visit some in the States when we're over there.

The A-7D Corsair II

The A-7D was about the same size as the Hunter, just a foot longer and 5ft extra in span, with a 7% greater wing area. Empty, it was 2,000 lb heavier than the Hunter, but the maximum take-off weights were vastly different – over 40,000 lb for the A-7, about double that of the Hunter. The non-afterburning turbofan engine (a Rolls-Royce Spey built under licence by Allison as the TF-41) produced 14,250 lb of thrust which was about 50% more powerful than the Avon in the F6.

The Hunter had four 30mm Adens with 150 rounds each, its only other weapon being the WW II vintage 3-inch rocket, eventually replaced by the SNEB 2·7-inch air-to-ground rocket. By contrast, the A-7D had a Gatling gun with 1,000 rounds of 20mm and could deliver the full range of US weaponry – from smokescreen rockets, cluster bombs of many sorts and up to four 2,000 lb bombs. The most I flew with was ten 750 lb free fall bombs.

What made the A-7D different from earlier US Navy versions of the A-7 and, indeed, all previous ground attack aircraft, was its avionic fit. It had the first operational digital navigation and weapon aiming computer (similar to the one that had taken Apollo to the moon a year

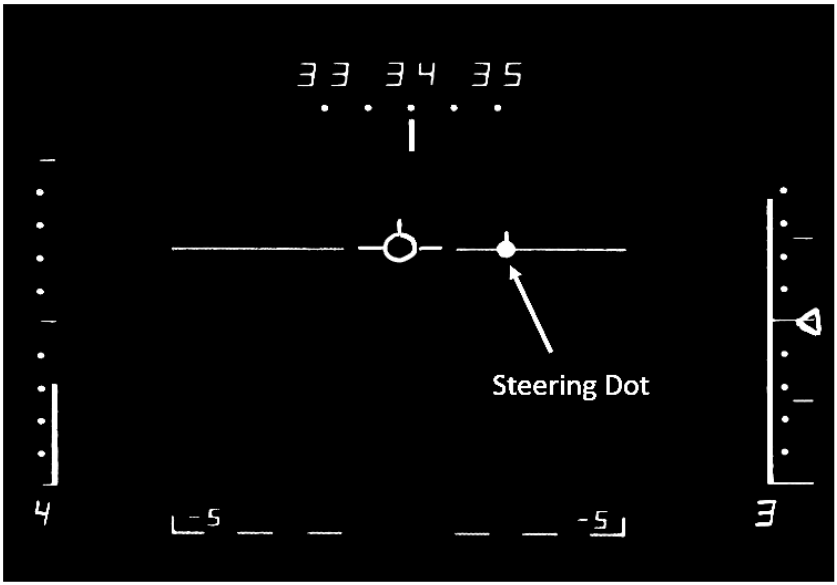
Conveniently serialled 71-0354, this shark-mouthed A-7D Corsair II was probably the flagship of the 354th TFW.

and a half earlier) and the first head-up-display – the HUD (made in the UK). Its avionics set the standard for the future.

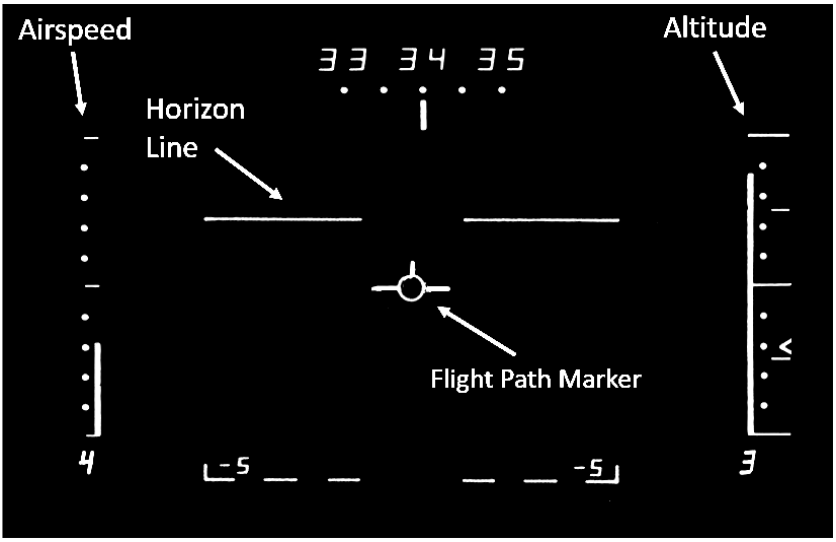
The computer was fully integrated with the Inertial Measurement System and the Doppler Radar (which also helped keep the Inertial System level and could re-align it in the air) and with the Forward-Looking Radar (which had five modes), the Projected Map Display, the Radar Altimeter, the Angle-of-Attack Indicator, TACAN, ILS and the Flight Director Computer. Finally, there was an autopilot – very useful if ATC re-routed you and you had to dig into the En-Route Doc and enter the co-ordinates into the computer.

As a Hunter pilot, *all* of these were new to me. Since the HUD was such an innovation, I think it worth spending a few moments considering the symbology and the way in which the pilot interfaced with the system.

For the first few sorties we were encouraged to use the 'head-down' instruments. But I, like most of the course, soon latched-on to the simplicity of the HUD. The aircraft symbol (displaying the aircraft's velocity vector) tells you where you are going and the horizontal lines are apparently fixed (1:1) on the outside world – so to fly exactly level, you just put the aircraft symbol on the horizon line – easy! Insert the co-ordinates of the next turning points, the target, the approach fix and the touchdown point into the computer and the steering dot tells you



The A-7D's HUD presentation – these electronic symbols were 'superimposed' on the real world.



The course at Luke included AAR.

where the next way point is. So turn, to put the aircraft symbol over the dot, and you are going in exactly the right direction – simple! Monitor the speed and height 'thermometers' on the left and right and the angle of attack, and you are not only fully orientated, but able to fly with great accuracy throughout the sortie, all the way to touch-down and within a knot or two of the correct speed, regardless of weather, wind or weight – all the information required was there, superimposed on the real world, on the cloud if IFR, or on the night sky. All, as it were, fixed on the real world. Weapon aiming was equally intuitive.

The Course at Luke AFB

As a member of the first course has written, 'The SLUF itself was quite easy to fly. We, being experienced 'old heads', all learned the basics in just a few hours; however, the rest of the three months were devoted to learning how to employ the bird and use all of its systems. Coming out of the F-100, it was like leaving a Model A Ford and stepping into a new Cadillac.'

For me it was a little more demanding, for I was not only dealing with a brand-new aeroplane with complex avionics, but also flying in a very different environment; I had to cope with full Instrument Flight Rules (IFR) and fly airways like an airline pilot – and I was a Hunter

pilot who would never admit to having been in an airway in my life! I also learnt very quickly to speak American, with an accent to match, otherwise I was not understood over the radio.

I should add here that there was no two-seater and no simulator! It was just, get in and fly it. As you can imagine, the first sortie was quite hard work.

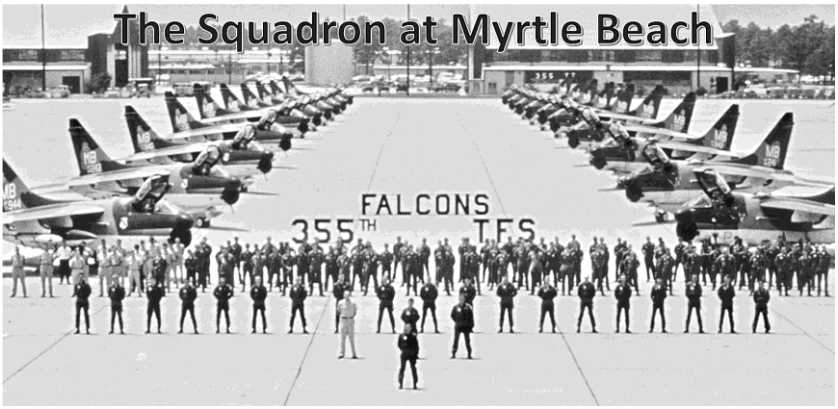
The course at Luke lasted eight weeks. I flew 26 sorties/42 hours of which 4 were at night – more night flying than I flew in some years on the Hunter – and included in-flight refuelling from a KC-135. After a few familiarisation sorties we were on the range. Weapon sorties, day and night, covered the full gamut: from 5-inch rockets; 200ft level laydown skip for napalm; 10°, 15°, 30° (which felt near vertical, we tried some 60° which was awesome!) dive, also toss and level radar bombing, all with practice bombs to start with and then 10 × 750lb HE on a tactical range, and strafe with the awesome (again) gun, and, to quote another student, 'The 20mm M61A1 Vulcan rotary six-barrel cannon, which had a rate of fire of 6,000 rounds a minute – that's 100 half-pound HE rounds per second! This was no machine gun that went rat-a-tat-tat. When you squeezed the trigger on this version of the old Western Gatling Gun, all you heard was a low-pitched whirl/growl/whirl as the hydraulically-powered cannon came up to rotation speed, fired and slowed back down. The bird carried 1,030 rounds – just over 10 seconds worth of firing!'

I kept a record of my weapon scores during the course – 1st sortie on the range – strafe 66%, skip 100%, 15° dive 115 ft, 30° dive (which felt near vertical) 187ft. By the 4th sortie my scores had come down to an average for four bombs of 55ft at 15° and 46 ft at 30°. Not bad for a QFI!

At the end of the course, Anne and the girls flew over from Myrtle Beach. After a quick tour of California, we drove home across the States.

Flying Operations at Myrtle Beach and in South East Asia

Back at Myrtle Beach, we all flew between 10 and 15 two hour-long sorties each month of skip bombing, dive bombing, rockets and strafe and a few radar bombs, mostly on scored ranges and tactical ranges along the eastern seaboard of the States, with a very few general handling or instrument sorties. All aimed at getting the squadron



The 354th TFW had three constituent squadrons, this one, the 355th TFS, and the 353rd and 356th TFSs.

combat ready while waiting for the order to deploy to Thailand. I did more flying than the average as I was the unit air test pilot and volunteered for lots of weekend cross-countries – seeing even more of the States.

On 10 October 1972 the 354th TFW's three squadrons moved to Korat in Thailand. This was the first combat deployment of the A-7D into South East Asia. Two days before the Wing flew out, and to my wife's immense relief, permission for me to go with them was denied by the American Embassy in Bangkok – I was a potential problem they could do without! I, and others who could not risk flying over the north, stayed behind and formed a training squadron. I've never had such motivated students – two weeks after the end of the course they were off to war.

The 354th TFW commenced combat operations on 16 October, taking over the Search and Rescue role from the legendary A-1 Skyraiders, supporting ground troops and trying to halt the flow of North Vietnamese supplies into the South.

On 18 December**,** the US launched Operation LINEBACKER II against targets in North Vietnam. By the end of that 11-day campaign, the A-7s had assisted in 22 rescues of downed airmen as well as flying many bombing sorties. They did not lose an aircraft – others were not so lucky. Fifteen B-52s were shot down, including six on 20 December, and twelve other aircraft were lost including two Navy A-7s. In total,

41,653 LINEBACKER II missions dropped 155,548 tons of bombs.

On 7 January Congress voted to prohibit further American military commitment to Vietnam, despite increased fighting, and on 15 January, with progress being made in the peace talks, President Nixon suspended all US air and naval attacks against North Vietnam. On the 27th, representatives of the US, South Vietnam, North Vietnam and the Viet Cong signed the Paris Peace Accords.

The A-7s stayed in Thailand for another year, but by then we had returned to the UK after a final holiday to the northwest corner of the States.

Summarised End of Tour Report

Comments on the Exchange Scheme. Being an exchange officer at Myrtle Beach had allowed me to, not only observe the USAF at work, but also to understand, operate and instruct on the A-7D Corsair II's new and complex weapons system. I had been involved in the formation of a tactical fighter squadron (the 355th TFS) and saw it deploy to South East Asia. I was the second IP to be upgraded on the formation of the 4554th Tactical Fighter Replacement Squadron (TFRS) and took part in the training of more than one hundred A-7D pilots. I had been given every opportunity to participate in exercises and tests, including two army co-operation exercises and the Category III weapons test at England AFB.

A major disappointment was, having gained British permission for me to deploy to Thailand with the 353rd TFS in April 1973, permission was not granted by the Americans. This would have been an excellent opportunity to take part in a squadron deployment and to observe, at first hand, the squadron in action.

Recommendations. No changes were required, either to the post or the required course. There was no need for the incumbent to be a QFI or PAI but it was essential that he had recent fighter ground attack experience.

The post should remain with a Tactical Fighter Squadron and *not* the training squadron; full use of the weapons system together with exposure to the organisation and operation of a fully mobile tactical fighter squadron cannot be achieved on the training squadron.

Perhaps the greatest value of this post has still to be realised as my next assignment is as a pilot on the Weapons System Accuracy Trial of

the Jaguar. The weapon systems of the A-7D and Jaguar are very similar in that both have inertial systems, digital computers, projected maps and head-up displays. I join that trial with just over 600 hours' personal experience of handling the A-7D's system, backed up by the USAF's 100,000 hours of operating it.

The Legacy

Like others returning from exchange tours, I was surprised that I was not 'debriefed' at all on what I had seen and learnt. My good fortune was that many of my subsequent tours allowed me to apply the lessons, skills and knowledge gained at Myrtle Beach and on the A-7D; I was never asked but I never missed an opportunity to tell, and to put them into practice.

I will close by briefly reviewing some of the ways in which my exchange tour paid dividends. When I became one of the two pilots on the Jaguar Trial at Boscombe Down. I expected the aircraft's avionics to match the A-7's; it did not. The Jaguar had a HUD that had to be interpreted and symbology that moved in relation to, and was scaled 5 to 1 to, the outside world. However, much good work was done to make the weapon system tactically useful, but the main outcome of the trial was evidence of its shortcomings – sufficient data was accumulated to justify a complete avionic refit. In my opinion, both the Harrier and the Buccaneer needed avionic updates even more than the Jaguar, but neither had undergone such a rigorous data-gathering exercise.

In 1977, A-7Ds were invited over from the States to take part in Strike Command's annual tactical bombing competition. The A-7s won *all* the individual *and* team trophies. As you might expect, this caused consternation at HQ Strike Command and, as the only person in the RAF who had flown both the A-7D and the Jaguar, I was 'invited' to Strike Command to explain the defeat! I outlined the differences between the two aircraft, their avionics, weapons and reliability and was subjected to some very aggressive questioning, by the engineers in particular.

For me, Staff College followed and then nine months in OR putting all my A-7D and Jaguar experience to work on FIN 1064, the avionic upgrade to the Jaguar.

Three years later, I formed and commanded the Tornado Operational Evaluation Unit at Boscombe Down and we spent 2½ months at Eglin

AFB in Florida on an EW trial. All the data from our sorties went through the USAF's analysis system and it came out automatically stamped 'Secret, NOFORN' meaning 'not releasable to foreign nationals', so we were not allowed to access our own data! The fact that I had done an exchange tour, and was known to the security system, eventually helped clear that blockage.

Later, as Commandant of the Air Warfare Centre, I visited the States many times and on each occasion the fact that I had flown the A-7 proved an advantage. I've only time to mention one example.

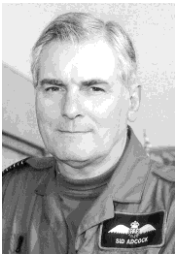
At the end of 1993, I was invited to attend a Blue Flag Exercise at Davis Monthan in Arizona. Blue Flag provides computer-based command and control training for the Joint Force Air Component Commander and his staff. As far as I know, I was the first foreign national to attend and, as I walked down the centre aisle for the initial training session with the General, I noticed that underneath the large banner 'Welcome to Blue Flag' was written 'Secret NOFORN'. I whispered to the General, 'Sir, I think I have a problem.' 'What's that, John?' 'The security classification is Secret NOFORN'. 'I'll fix that,' he said. So, after his introduction, he invited me on to the stage and introduced me, 'This guy taught me to fly the A-7, so he's one of us, and the security classification does not apply to him.' I took a 4-man team to the next Blue Flag and then a full team to the following one. The rest is history as, for many years, the RAF has had a permanent presence in the Headquarters there.

It is difficult to sum up my tour, the follow-on affect throughout my career and the benefit to the RAF in a few words. But I'll try. Besides the mind-stretching experience of total immersion in another way of doing everything, in a place where the sun always shone, I would not have had the opportunity to fly three brand-new aircraft, the A-7D, the Jaguar and the Tornado, nor to fly the operational evaluation of two of them; 1:1 HUDs would have taken longer to come into Service, and the Jaguar would not have got such a good upgrade with FIN 1064. I probably would not have formed the Air Warfare Centre and the RAF's participation in Blue Flag might not have been so rapid. All because of an exchange tour – a substantial legacy by any standard.

MEET ME IN ST LOUIS – AN EXCHANGE TOUR AT HQ MILITARY AIRLIFT COMMAND 1983-86

by Gp Capt C B 'Sid' Adcock

INTRODUCTION



Sid Adcock graduated from Cranwell in 1962. An initial stint on Hastings with No 70 Sqn was followed by CFS and a QFI tour; his subsequent flying career was on the VC10, culminating in command of No 241 OCU, plus three years in the USA with HQ MAC. Ground appointments included tours with the MOD and at SHAPE and as Station Commander at RAF Newton. Following retirement, he continued to fly with No 2 AEF.

When my family and I arrived at Lambert St Louis Airport in August 1983, we found ourselves in the throes of a brutal heatwave, with daily temperatures well in excess of 100°F (38°C). As we progressed on foot from the aircraft to the passenger terminal it was like walking through a furnace. The extreme heat was just one introduction to the many unusual climatological, cultural and social factors that we were to experience in the course of a tour of duty lasting almost three years.

LOCALITY

St Louis.

Given the remoteness of some Air Force Bases in the USA, we were fortunate to find ourselves residing in the vicinity of a large city. Located at the confluence of the Missouri and Mississippi Rivers, and offering many attractions, St Louis was dominated by a vast steel arch, rising to 630 feet, erected as a memorial to all those hardy Americans who opened-up the West. With a population at the time of some 300,000, the city was a focal point for the people of Illinois and Missouri who occupied the lands east and west of the Mississippi. Having its own Symphony Orchestra, a well-endowed Art Gallery and several theatres, it was also home to an American football team as well as a major-league baseball team – the St Louis Cardinals. All of these amenities we were to enjoy in the course of our tour.

Scott Air Force Base.

Located about a 30-minute drive east of St Louis, Scott was one of

the oldest Air Force Bases in the USA. It was home not only to the Headquarters of the Military Airlift Command (MAC) but also to that of Communications Command. All told, there were some 12,000 American personnel living and working on the base, and just three British officers and their wives. Covering a vast area, the base was served by its own airfield, which could handle MAC's largest aeroplanes. Apart from the usual domestic and recreational facilities, including a championship golf course, it was also the site of a large hospital. Patients came from all over the USA, transported in a fleet of C-9 aeromedical aircraft based at Scott. On-base housing was in great demand and, as there were more than twenty generals working in the two Headquarters, we of lesser rank were accommodated in duplex houses. Although of modest size, the houses were, nevertheless, well-heated in winter and air-conditioned in the summer. After a week of 'in-processing', and a hand-over from my predecessor in the post, we settled down to our new life in the USA.

THE ASSIGNMENT

MAC STANEVAL

As an RAF wing commander on exchange in the Headquarters, I was assigned to a post which came under the Deputy Chief of Staff for Operations – 'the DO' – in a branch known as Standardisation and Evaluation. Known universally as MAC STANEVAL, we were designated within the Headquarters as 'DOV'. Of the various external sub-formations under command – the two Numbered Air Forces, together with the wings and squadrons under their operational control – each had its own section of DOV responsible for carrying out supervisory checks and ensuring that the various MAC directives and regulations were being put into effect.

Pre-employment Training

In order to undertake my duties, I had first to qualify on a MAC aircraft. In view of my extensive operational experience on the VC10, it was decided that I should qualify on MAC's C-141 Starlifter. Accordingly, in the autumn of 1983, I attended a short conversion course at Altus AFB in Oklahoma. Subsequently, to gain experience on type, I flew under supervision on two successive MAC missions; one across the Atlantic and the other across the Pacific. Not long afterwards, during a visit to Charleston AFB, I was checked out as a Flight

The Lockheed C-141B Starlifter.

Examiner by Col John Vilensons, the Chief of MAC STANEVAL. Subsequently, there was a monthly currency requirement that I usually completed at one of the wings located either on the eastern or western seaboard of the continent. Later in my tour I returned to Altus to carry out a course on air refuelling. Later still, at Little Rock AFB, Arkansas, I also undertook a short conversion course on the C-130.

Aircrew Standardisation and Evaluation Tests

The role of HQ MAC DOV was to ensure that the DOVs in subordinate formations were carrying out their supervisory functions appropriately, a mission that was accomplished through a series of Aircrew Standardisation and Evaluation Tests (ASET). An ASET involved a visit by elements of MAC DOV to a wing in the Continental USA or to a MAC detachment overseas. Typically, the visiting team comprised some twenty examiners covering all crew positions. The unit was then tested in its various roles and functions and, when all the results had been assessed, awarded a grade: Outstanding, Excellent, Good or Satisfactory. On returning to Scott, the results were reported to

C-141B in pursuit of a KC-135.

CINC MAC at the next available morning briefing. Where deficiencies were noted, strenuous efforts were made by the MAC Staff to address the problems. After participating in several ASETs as a member of the team, I was in due course promoted to Team Chief. In this capacity, I carried out a number of further visits in the course of my tour.

Staff Issues

On taking up my appointment in MAC DOV, I was initially assigned as Assistant Chief of DOVA, a sub-branch of DOV responsible for the oversight of MAC's largest aeroplanes: the C-5 Galaxy, the C-141, and the C-130. In due course, when a vacancy occurred, I was invited to become Chief of DOVA. My section comprised some twenty officers and senior NCOs, all highly experienced in their respective aircrew roles. While I knew little about the various aircraft types, and even less about MAC Operations, I was, nevertheless, an experienced staff officer. Consequently, by combining our respective talents, we in DOVA were able to make a highly effective contribution to the resolution of the many issues that came our way.

Crew Resource Management

One staff issue with which I became particularly concerned was that of human factors in MAC accidents. In the course of addressing the problem, I eventually discovered that, in a parallel development, United Airlines, one of the major carriers in the USA, had recently developed a training course known as 'Crew Resource Management' or 'CRM'. This type of training concentrated not on aircraft handling skills but on the 'soft' skills of small group dynamics: leadership, communication, assertiveness, cognitive development and self-awareness. In conjunction with other departments, I arranged for about 40 senior MAC aircrew, myself included, to attend one of these courses, and thereafter we began to introduce this kind of training to all MAC aircrew.

AFTERMATH

My exchange tour in the USA endowed me with many benefits. Apart from the personal development that inevitably results from such a challenging and demanding appointment, and the acquisition of a life-long circle of American friends, it also brought two practical advantages. Sometime later I was assigned to SHAPE, where my knowledge of, and facility with, the American staffing system and organisational culture served me in good stead. So much so, that at a time of unprecedented political and military change, I was able to make an effective and substantial contribution to the work of my Division. Secondly, in my final tour of duty, I was tasked with introducing CRM training into the RAF. This initiative saw the development of a foundation course that was undertaken by some 6,000 aircrew, thereby laying the groundwork for on-going improvements in operational efficiency and flight safety. Finally, after retirement, the details of my American exchange tour provided an unusual and interesting chapter in a published book about my 50 years of flying in the RAF entitled *Looking up at the Sky*.[1]

[1] *Looking Up at the Sky: My 50 years flying with the RAF, 1960-2010* by C B 'Sid' Adcock (Woodfield Publishing; 2017).

FIRST DISCUSSION PERIOD

Air Mshl Sir Rob Wright. A fascinating morning – six different perspectives.

I'll offer just one anecdote, which relates to Sid's comment on language. I recall stopping to fill my car up with gas at a filling station near Oceana. The lady who was filling the car noticed my US Navy khakis, with its squadron leader's slides, and she said, 'How come you speak such good English for a foreigner?' So I said, 'Well, it's because I *am* English.' She pondered that for a moment and then concluded, 'Ah, so English is the first foreign language they teach you guys?' (*Laughter*) It was a classic case of, 'Two nations separated by a common language'

Wg Cdr Jeff Jefford. Back in about 1970, I was talking to a guy who had done an exchange tour on F-100s and flown one across the Pacific when his wing deployed to Vietnam. But the Air Attaché soon found out that he was there and had him promptly shipped back Stateside, although he stayed in touch and received constant feedback. When he eventually returned to the UK he was well-informed and fully up to date with recent developments in tactics and techniques and keen to spread the word. But he found that the RAF didn't really want to know – there was a 'Not invented here' attitude. Jock, you indicated that you had some reservations about your reception, although, by contrast, the Service did seem to glean some benefit from John Lumsden's experience. What was the general feeling from the panel – about the RAF's reaction to your coming him full of Americanism?

Gp Capt Jock Heron. Well, as I said in my presentation, it was fairly negative. At that stage the MOD was focused on 'Did you fly Phantoms?' 'No.' 'Did you fly the F-111?' 'No – but I saw one.' And that was about the extent of the conversation. In terms of tactics, remember that, in the late-1960s/early-'70s, RAF dogma dictated that everything would be done at 200 feet, ·9 Mach in the dark. And that was what I had to contend with in the early days of MRCA. I believed that the aeroplane might well have to do other things, but that was not very well received by the hierarchy at the time, so I don't suppose that it did me much good personally – but I thoroughly enjoyed the tour.

Air Cdre Linc Taylor. My experience was really good. I flew Harriers

before my stint on the F-117 and when I came back, I was put onto the Typhoon. Initially, my USAF experience wasn't particularly useful because the Typhoon had a radar – which neither the Harrier nor the F-117 did – so I had to find out how to use one of those, which I did via a Phantom radar instructor's course. The Typhoon, of course, had been designed primarily for air defence, but it was going to have to do a lot more – multi-role stuff – and my experience of conducting very precise attacks on both Harrier and, especially, the F-117, paid dividends. To cite just one example, the Typhoon system originally worked in degrees, minutes and seconds. But that's not the right answer in the air-to-ground business; it's simply not accurate enough. It needed to be degrees and minutes – to three decimal places. That was the sort of practical feedback, based on my USAF exchange, that I was able to introduce into the Typhoon programme and my experience was always respected and well received.

Air Cdre John Lumsden. My experience was also very good. I came back to the Jaguar – to Boscombe Down as a test pilot. Most of my colleagues on the Jaguar were actually ex-Lightning men so there was, what I would describe as, some 'creative tension' between the test pilots. Because of my experience with the A-7, I knew how the Jaguar's system *should* work, but it simply didn't. I was constantly saying, 'But it doesn't do this,' to which the response would be, 'Well, it wasn't designed to do that.' To which I would respond with, 'Well can we tweak it so it that can do it?' And, it was often possible to arrange a fix, so that was the benefit that I was able to bring. It was actually quite a long-lasting effect, because I had seen, and experienced, another, and often better, way of doing things. Later on people would still sometimes look at me a bit sideways, and ask, 'Why are you saying that?' To which I would explain that, 'There's a big air force over there and they really do know what they are doing – it may not always be exactly the right way for us, but we can tweak it to make it fit.' But, overall, I think it fair to say that I was, perhaps a little reluctantly, generally accepted at Boscombe Down.

Air Cdre Mike Gibson. Is there a best time for pilots to do an exchange tour? I'm thinking of two things in particular. First, one was perhaps filed under 'out of sight, out of mind' by Barnwood, or Innsworth. And secondly, that everyone serving in the USA came back

with F1369s that were straight 9s and Spec Recs – and therefore ignored.[1]

Gp Capt Bob Iveson. That certainly was the case, and it still was when I was the Assistant Air Attaché 20 years after I did my own exchange. I was stationed in Germany, and had already been selected to go to the Marine Corps when my predecessor, 'Hoof' Proudfoot, managed to get himself extended for a year. I was given the options of not doing the exchange or spending an extra year in Germany until the slot became available. In effect, Barnwood's line was, 'You can still do the exchange, but it will cost you a year before you make squadron leader, because you're not quite there yet and the next, at least, two F1369s will be ignored and when you come back you will need at least one good one before you will even be considered for promotion. So there is certainly a time *not* to do it, but I wouldn't have let that stop me from going. In short, I believe that the best time to do it is – today.

Wright. I would add that, if someone had told me that I was going to spend 10% of my air force flying career in America I would certainly do it again. But the point about reports is very valid. In answer to your question, if, for example, you are posted to the States on exchange, as I was, as a newly promoted 29-year-old squadron leader, you've got the time to give, to bring back and then to use that experience as you develop your career. But the perceived attitude when I came back to the RAF was one of, 'you have had a good time for three years, now we need to look at you again.' So you do lose some time, but there is no doubt in my experience that spending time with the Americans as young as one can, and in that rank, is very worthwhile.

Heron. When I was on the AFDS at Binbrook we had a very talented American major, a qualified test pilot, on exchange with us. My Boss at the time, Wg Cdr, later Sir, John Nicholls, initially wrote the major's annual report using the standard RAF yardstick – which, had it been despatched, would have completely demolished his career! This cut both ways, of course, as I discovered while I was on exchange at Nellis. I had to completely revise my attitude to writing reports on my USAF people because, had I applied the RAF system, it would have destroyed

[1] The RAF Form 1369 is an officer's Annual Confidential Report.

their careers too. It simply *had to be* 'straight 9s' leaving you to try to flag-up somewhere in the narrative why this particular chap was special. I have no idea whether it is still the case today, or whether it has since been sorted out but, at the time Mike, you are quite right – the RAF and the USAF differed in their means of defining just how good 'Good' is.

Lumsden. While I was on my exchange a certain C J Thompson, was also on an exchange tour – so it clearly doesn't affect some people's careers! I got a bit nervous half-way through my tour when I noticed that contemporaries, like C J Thomson[2] – and Sandy Wilson[3] – were being promoted and I wasn't! So I asked for a career interview. I flew back to the UK, to Adastral House as it was at the time, knocked on the door and they handed me my 'blue letter'.[4] So it was a wasted journey really. An exchange posting can have an adverse effect – but if you're a C J Thompson, it certainly didn't.

Taylor. When is the best time to send someone on an exchange – for the RAF to benefit, as distinct from the individual? I think that a common theme that has emerged this morning is that we have all been afforded a remarkable privilege and we need to repay that via our leadership of units and our development and refinement of tactics.

So, the important question is *who* do we send? It has to be individuals of proven ability who have the potential to do good things for the Service when they return. But, of equal importance, while they are in America, they are also *de facto* ambassadors for the RAF, so they do need to be competent professional operators. If you study the way that the USAF operates, it is clear that they really are professionals – there are very few generals in the UK who can discuss tactics in the same way that I have seen it done in America. We always need to send our best people.

Wg Cdr John Stubbington. I did an exchange tour in the mid-1970s

[2] Later Air Chf Mshl Sir John Thomson, AOCinC Strike Command 1992-94. In July 1994 he took up the new NATO appointment of CinC Allied Forces North West Europe but sadly died within days of taking office.

[3] Later Air Chf Mshl Sir Andrew Wilson, whose final appointment was as the first AOCinC Personnel and Training Command, 1994-95.

[4] Significant personal correspondence raised by the Air Secretary's Department, such as notification of a promotion – or early compulsory retirement – were (still are?) traditionally written on blue notepaper.

with the USAF intelligence organisation. Incidentally, an exchange of Intelligence staff actually started in WW II between the RAF and the US 8th AAF. When I began my exchange appointment, I had spent the previous four years in our own Tech Int organisation and, from staff liaison visits, was already well acquainted with the individuals with whom I would be working.

If I may comment from my personal experience with respect to 'straight 9s' on a F1369, and the way to get around them. When I came back, my Desk Officer observed on my 'straight 9s' but he picked out a comment made by one of my American Reporting Officers who had written that, 'This officer could successfully play golf in a minefield.' (*Laughter*)

Wright. I recall my skipper giving me straight 9s in my first F1369 Annual report and when I informed him that it might be seen as excessive back home, and perhaps to amend it (slightly!) to reflect RAF reporting standards, he pointed out that this would be seen, in the UK, as being negative. To come back from America with 7s and 8s instead of the customary 9s would not reflect at all well, and he went on to say that if there were 10s available, he would give me 10s! I hasten to add that that was not a specific reflection on me – so much as the US Navy system. Everyone on my squadron received the equivalent of 9s but in the top corner of the form there was another little box. If there were 32 pilots on the squadron, each one was given a number between 1 and 32. So you could ignore the bulk of the report – just go to the top box to see an individual's place in the pecking order.

Before we adjourn for lunch, I would like to offer the floor to the US Air Attaché here in London.

Col Emmett Wingfield. Thank you, Sir. I did an exchange myself – with 101 Sqn at Brize Norton – on the Queen of the Skies, the mighty VC10. I have been very gratified to hear today's presentations, which mirrored my own experience of being welcomed and socially integrated into the squadron. It was perhaps a little different coming in this direction. I left the US qualified to conduct, and to teach, every KC-135 mission in all refuelling modes. When I got here, I was told, 'This is the VC10 – you sit there – in the right hand seat.'

It was about a six-month OCU, followed by about three months as a co-pilot before I eventually got re-roled into the left hand seat as a

captain, when it was finally understood that I really was competent to do that – which took rather longer than it had really needed to. That said, I was soon rated and I left the VC10 fully qualified in all techniques – receiving and dispensing fuel, conducting trails and so on – after a very successful tour which, in some respects, shaped my subsequent career.

Following my exchange, I have continued to have fairly frequent dealings with the RAF. After Staff College I worked 'UK Programs' in the USAF HQ's International Affairs Office and I had the great pleasure of introducing the RC-135. On the second day of my staff appointment I attended a meeting where I learned that the RAF wanted to lease some RC-135s because, following the Haddon-Cave Report, the Nimrod was going to be withdrawn from service earlier than planned.[5] For legal reasons, we weren't able to 'rent' US Defense Department material, but we could sell you some! So that's what we did and the three RC-135s were delivered on time and under budget and you are operating them today. I don't believe that that would have happened so smoothly if I had not had so many contacts within the RAF.

So, here I am today, back in the UK and once again having regular contacts with the RAF. But the links, the ties, the relationships that were built up in the past still serve the USAF – and the RAF – because they constitute a 'circle of trust.' General Tod Wolters, CINCUSAFE, who is shortly to take over as SACEUR, put it very well when he was here last summer when he said that the relationship we have is not friendship – it's family. And that has certainly been my experience, both in my time 'in the RAF' between 2003 and 2006 and in my current appointment.

Thank you for giving me the opportunity to say all of that.

[5] The Haddon-Cave Report into the issues surrounding the loss of a Nimrod MR2 in Afghanistan in 2006 is accessible on-line.

A NAVY YANK IN THE RAF

by Capt Don Fennessey

Don Fennessey joined the US Navy in 1972 and flew the A-7E Corsair II from the USS Enterprise *in the Pacific prior to coming to the RAF in 1977 to spend two years with No 3(F) Sqn at Gütersloh. He returned to the USN and A-7E in 1980, with further Pacific deployments aboard the USSs* Kitty Hawk, Midway *and* Independence, *including shore-based time in Japan. He subsequently commanded an F/A-18 Hornet squadron before serving on the Sixth Fleet staff in Italy. He spent four years as Naval Attaché in Paris prior to a final tour at the Naval War College and retirement from the Navy in 2002.*

I know what you're thinking, 'Bloody Americans'. You're just jealous of my flashy Navy flight jacket (which doesn't zip like it used to in 1977) – but I was invited to speak.

Many thanks to Jeff Jefford for his patience with my numerous emails, and special thanks to Jock Heron who 'shanghaied' me into this event a year ago. Of course, I was delighted to accept. I've had a year to try to decide how to compress three of the most wonderful years of my life into a 20-minute talk. Finished tweaking it this morning! I do recommend Bob Marston's excellent book *Harrier Boys, Vol 2*, especially Chapter 4, which includes contributions from other exchange pilots.[1]

I know you are all familiar with the Harrier and what it could do, so I'll try not to bore you with that, but rather try to articulate how RAF operations amazed me with how extraordinary they were, even compared to carrier operations, which are mighty impressive themselves.

Selection Process

So how did I get posted to the RAF? Apparently, no one else had thought of it, as it was not a typical career move and there weren't many exchange flying jobs anyway. I enjoyed unusual duty assignments, having spent a summer as a Midshipman on a Norwegian gunboat. I had known about other US Navy guys flying Buccaneers with the Royal

Navy, Etendards with the French, and F-104s with the West Germans. When I asked my detailer/desk officer, he was unaware of any of those billets but said he'd check into them. He called back a few days later and said all he had was a Harrier spot in Germany. I said, 'Great, I speak fluent German' and as you would say, 'Bob's your Uncle' I was going to be part of the RAF with its glorious traditions of the Battle of Britain, dashing pilots smoking pipes, drinking warm beer from pewter tankards, and charming the ladies. I was pretty sure I could do all that, except the pipe smoking.

What was the Navy thinking? In the late 1970s the Navy was sort of looking at using VSTOL aircraft dispersed on lots of small-ish carriers like the Marines were already doing, or even putting them on battleships, but the Navy remained committed to a dozen or so big-deck carriers with large air wings of conventional aircraft.

What instructions did I receive from Washington DC, Naval Aviation Systems Command or the Naval Attaché in London? None. Nothing to evaluate. No forms to fill out. No periodic reports to be submitted. Maybe my predecessor, Lt Cdr Byron Duff, a test pilot, had already done enough analysis. The US Navy was sending a 26-year-old bachelor to the RAF. What could possibly go wrong?

Objectives

In all military operations it is essential to have objectives. Although not very lofty, I figured these would suffice for my time with the RAF.

1. Return to US Navy in one piece.
2. Don't cause an international incident.
3. Don't break anything.
4. Learn to appreciate English beer.
5. Take photos of castles.
6. Bring back a princess.

Arrival in UK

I left the USS *Enterprise* which was operating near Masirah, Oman in March 1977 with orders to Pensacola, where I got 38 hours of helicopter training in TH-57 Sea Rangers to familiarize me with vertical flight. As you know, flying a helo is completely different from a Harrier, but it was great fun.

While with the RAF, I was administered by a Senior Chief Petty

Officer at Navy Europe Headquarters in London who never checked on me in almost three years, but I remember talking with him using those bizarre English pay phones that made that bwoop bwoop sound when you had to put in more money and then made the grinding noise when you inserted the coins. 'Hi, Senior Chief, Lt Fennessey here. Can you hear me?' Bwoop bwoop bwoop. Damn! Insert coin. Grind, grind. 'Hi, Senior Chief. Can you hear me?' Bwoop bwoop bwoop. Repeat. How quaint!

Exchange Concept

Let's focus for a moment on the word 'exchange'. As an exchange officer, what could I bring to the RAF? Rugged good looks, boyish American charm, and superb barbecue skills pretty much summed it up.

I came with 1,100 hours of flight time, including about 850 in the A-7E Corsair II, but much of that was at high altitude or over the ocean. I had more night and instrument time than anyone, including the Boss, but the Harrier didn't have a night or all-weather mission. I had 277 arrested landings, which is how you determine pecking order in Naval Aviation, but useless in the Harrier world.

I knew enough to generally be in the receive-only mode initially because the RAF way of operating was very different, as I soon discovered. I did at one point try to introduce hand signals for changing radio frequencies. RAF hand signals were only one, two or three fingers which meant Stud 1, Guard (243.0) or Stud Alpha (243.8) respectively. In the US system, fingers held vertically next to your ear meant numbers one through five, held horizontally meant six through nine, and a fist meant zero. You could easily direct a wingman to any specific frequency. RAF was not interested. Never mind. I would learn as much as I could from them.

RAF Brawdy

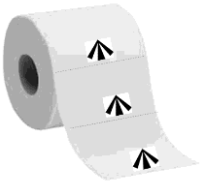
My first stop was a four-week UK Orientation Course with Standards Squadron at Brawdy flying the Jet Provost and two-seat Hunter – essentially learning to speak Brit while getting lost over Wales. Say 'circuit' rather than 'landing pattern', 'peri track' rather than 'taxiway', 'line up' rather than 'position and hold', etc. No real language barriers so far. My biggest disappointment was that I was scheduled to fly in the Meteor T7 with the legendary Flt Lt 'Puddy' Catt but my left leg was injured during mess games at my first RAF dining-

No 23 Harrier Course, No 233 OCU, September 1977. L to R: Lt Don Fennessey, Flt Lt Dave Morgan, Fg Off Adam Stoaling, Fg Off Pete Cockman and Flt Lt Simon Wood.

in night which sidelined me until I got to Wittering. This was clearly going to be a great tour of duty.

RAF Wittering

I joined No 23 Course with Flt Lt Dave Morgan of Falklands fame, Flt Lt Pete Cockman, Flt Lt Adam Stoaling and Flt Lt Simon Wood, who was my best mate in the RAF and highly instrumental in helping me accomplish Objective #4. If you look closely at the photo you will see that my left leg is fatter than my right one because of the heavy bandage on it from the dining-in incident at Brawdy, which caused me to miss a bit of Whirlwind helicopter training at Shawbury. However, after three weeks of ground school and limbering knee bends on the bar stools in the mess, I was fit to fly in time.



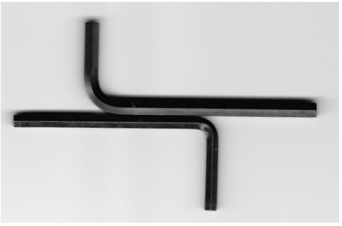
While at Wittering I was introduced to MOD loo paper. Each sheet had the MOD arrowhead on it – I couldn't imagine anyone wanting to steal the stuff because the paper was so waxy. I didn't think it was up to the job. How medieval were these Brits?

I did run into my first language problem while at Wittering. One of the first WRAF officers I met was sent to fetch me from dinner in the mess to go to the pub with the gang. Confidently assuming this was going to be a memorable evening, I asked her what she'd like to drink, and she responded 'Brtvkorngandlmnade.' 'Pardon?' 'Brtvkorngand-lmnade.' 'Pardon?' Britvik orange and lemonade – whatever that was. No alcohol. No memorable evening.

A-7E Compared to Harrier GR3

As special as the Harrier was, its cockpit and avionics systems were a far cry from those of the A-7E, which was of roughly the same era. I had incorrectly assumed the Harrier was of a similar technological sophistication. The A-7 had a very reliable digital inertial navigation system, a multi-mode air-to-ground radar, an excellent head-up display, and other state-of-the-art kit such as a useful radar warning system, chaff and flares, and a jammer that the Harrier didn't have. I was astounded that the Harrier didn't have a radar altimeter, especially given the amount of time spent at low altitude, and its low-angle dive weapons delivery with an eyeball-judged 200-foot release height, which would have been so much more accurate if coupled to a radar altimeter! The Harrier stick switches were very strange, especially the gun trigger which required some awkward finger acrobatics, but maybe that was just another quirk of British aircraft, based on the short time I spent in the Hunter cockpit and the other aircraft sticks on display in the RAF Museum. The A-7E had a well-designed cockpit; the Harrier didn't, but the Harrier had an unmatched versatility, as you know.

The key to the Harrier was a magic tool – two Allen keys welded back-to-back. Without them you were in big trouble. You needed them to open any access panels, including the one for fueling. We took extra care to have one with us whenever we expected to land anywhere other than a Harrier base. The fasteners that the magic tool opened were not captive fasteners, which meant they usually fell on the ground instead of staying with the panel. This was a particular delight when opening or closing the baggage



Two Allen keys welded back-to-back – do <u>not</u> leave home without one!

compartment panel on the belly of the Harrier behind the speed brake. This panel, always covered with oil and hydraulic fluid, was removed or replaced while lying on your back, usually in a puddle. Chasing the non-captive fasteners around the ramp made it even more fun.

Harrier Flying

We 'bona mates' flying the 'bona jet' were very cocky, and for good reason. The Harrier was tricky to fly, and the mission was very demanding. I believe other aircrew were envious of our status – and probably considered us prima donnas. We were always careful to announce that we had 'four green' in the landing pattern, especially at other RAF bases, rather than 'three green' for lesser mortals. 'FOUR green!' in case you hadn't heard it the first time.

Harrier flying was almost all at low level and RAF pilots were very good at it. Having been spoiled by the reliable A-7E's systems, I struggled with basic low-level navigation using just a map, compass and stopwatch. In the Navy we'd meticulously plan low levels, carefully making strip charts of a handful of Federal Aviation Authority-approved routes. On the OCU I was stunned one day when, after having spent hours the night before preparing for a flight to Wales, I was told the weather was duff there; re-plan for Scotland; brief in an hour. What!!! The Navy would have canceled the trip, but the RAF just quickly re-planned – something I eventually got the hang of.

Normal Navy training targets were either raked ranges or large structures such as dams or bridges. The RAF used road/rail crossings, antenna masts or small POL storage tanks. Target acquisition required extremely precise navigation on 1:50,000 maps and was very demanding.

The Harrier course was tough stuff and I realized that not all RAF pilots made it through the OCU, so I was very relieved to have passed the course and was sent out to become one of Wg Cdr Richie Profit's pilots on 3(F) Squadron in April 1978.

RAF Gütersloh

In the late 1970s RAF Germany was very much in a Cold War setting. It was all very real and serious, especially being only 60 miles from the East German border. I had never seen NBC kit before – tin pot helmet, gas mask, and charcoal-lined flight suit – and never heard the hooter blow. There were times when I wasn't sure if it was just a drill.

One of No 3 Sqn's Harrier GR3s, XW766, at Gütersloh.

When I got to the squadron, I was surprised that I was not given any substantive non-flying responsibilities, including Duty Officer, but I wasn't complaining. US Navy aircrew *all* have collateral duties, most of which require closely managing enlisted personnel, which requires a lot of time. Many of our American lads would get into legal trouble. Yours didn't seem to – or at least I was unaware of it. In the RAF, the aircrew only did aircrew stuff and all the ground crew fell under the auspices of the engineering officers. My job on 3(F) was Squadron Silver Officer, which required me to go to the mess once a month and inventory the WW II pewter tankards, silver statuettes and model aircraft we'd put on the tables for dining-in events. Hardly a challenging job, so I could focus on improving my flying skills and AFV recce. Spots and grilles = German Leopard tank. Dustbin man = Dutch YP-408. I haven't forgotten.

Flying in Germany was wonderful, especially when our targets were real Hawk and Nike SAM sites, real AFVs or real military installations. Flying over the Dambuster dams on the Möhnesee, Edersee and Sorpesee, even though we weren't supposed to, was really special.

Fitness reports were very different. In the Navy, everyone receives inflated grades on their evaluations, or your career is over. In the RAF I was elated to be considered average.

Field Deployments

I found the field deployments amazing, but the Harrier Force had

developed this into a fine art and did them routinely three times a year. Convoys of dozens of trucks were loaded, and the ground crews set off after the Regiment had secured the sites. Royal Engineers laid metal planking for a 700-foot runway, landing pad and any necessary taxiways, including skinny ones for the outriggers. How do you determine if a grass strip is suitable for Harrier operations? If you can survive driving a Land Rover on it at 40 mph without serious injury, it's OK. Sir Richard Johns' book *Bolts from the Blue*[2] says 30 mph without hitting your head on the roof, so both are good guidelines. The Royal Signal Corps set up communications between the hides, the Ops and GLO cabins, and whoever was up the chain of command – TOC, FWOC, TAOC, or whatever. Never understood all that stuff. Two squadrons each deployed six aircraft to three sites, all within a ten-mile square. Altogether 36 jet aircraft hidden in the woods. Wow! As soon as the morning mists cleared, twelve Harriers would roar airborne from six sites headed in all directions.

I remember launching from Gütersloh on a Friday afternoon. It had been below VFR minimums with haze all week and we had to get to the site that day. Weather was just getting to be barely good enough and I launched on the wing of my Flight Commander, then-Sqn Ldr Peter Squire. I soon didn't know where I was, and his radio quit, but he led us to the town of Delbrück which has a sharp-pointed church spire we used as a landmark. Head 052°, fly past the Army tank wash racks on the left, gear and flaps down, turn left to 232°, look ahead for the field with the bit of woods sticking into it from the right, select hover stop, stabilize over the pad, crack the nozzles slightly aft and settle down for a creeping vertical landing. Taxi to your camouflaged hide and you're home. Wow! Not many US Navy guys had ever done *that*!

In the morning at 0600, you heard the generator start, the light in your tent turned on, the Duty Officer got a bucket of hot water from the mess tent, and we all stood around the bucket in our long underwear while shaving. Greasy eggs and 'sausages' for breakfast, all washed down with a big mug of tea, and we were good to go. The GLO briefed us on the scenario showing the Commie bastards coming across the border. We were paired up with our wingman for the morning and briefed the admin parts of the flight which generally didn't change – rendezvous after takeoff, 420 knots en route, 480 knots from the Initial Point (IP) to the target, 108 mils on the gunsight, straight-in Cluster

One of No 3 Sqn's Harrier GR3s, XV792 in the field. (BAE)

Bomb Unit (CBU) attack, rendezvous off target, etc, return via Delbrück and land. After the brief it was time to jump into the jet in the hide. Wait for a mission.

OK, here we go! 'JOC and FEN, your mission number is 3M206. Close Air Support. Target is armored vehicles at grid coordinates blah blah blah. Contact Forward Air Controller Limey Jack on TAD 15 at Contact Point 118. Carry IPs 119, 121 and 122.' Corporal Yorston would then come running to the hide with the target marked on a 1:50,000 map. We'd brief the details of the flight over the intercom, pull out our booklets of all the IPs in northern Germany, then plot the route in chinagraph on an acetated 1:500,000 map using a protractor and a ruler with time ticks marked on it. Then we did origami-folding so the maps could be useable in the cockpit. Good to go. Taxi to the end of the strip, flaps down, engine slam checks, water injection on, full throttle, 120 knots, nozzles down, get airborne, nozzles slowly aft, undercarriage up, engine cuts back automatically to 93% – that was disconcerting the first few times. Rendezvous, proceed on mission, return to the site in 30 minutes, land, debrief the GLO. Weather report 0081X – no clouds, no ceiling, 8 km visibility, no obstructions to visibility, and suitable for flight operations. Wait for our next mission.

The ground crew practised weapons loading, fueled the jet, handed you a KitKat and a Coke. Maybe you'd unstrap, stand up and pee over the side, then strap back in. 'JOC and FEN, your mission is…' We'd do that five times before lunch! At the end of the flying day we'd hop in a

The groundcrew – the team that made it all happen.

Land Rover, find an Army or schoolteachers' mess, grab a bath and/or a beer, eat dinner somewhere, hop back in the Land Rover, find our way back to the site in the woods, time for sleepy bobos in your sleeping bag, and do it again the next day. Wow!

Every field deployment, one of the sites had to move in order to flee ahead of the Commie bastards about to overrun it. This was really hard work, especially if dressed in full NBC kit. On one deployment we were near the base of the Queen's Dragoon Guards, a very posh regiment, and visited the bar there. When one of our pilots ordered a beer, he was told by one of the officers, (use derisive snooty posh accent here), 'Oh, I suppose we could find you a beer.' Sure glad I was with the RAF. One drizzly Thursday morning during that same deployment I was in the midst of my morning 'necessaries', enjoying the view of the site while seated on a porta-can surrounded by Hessian screen and using the MOD waxy loo paper. Now I got it! The stuff is waterproof! From my vantage point I spied a guy who looked like a Pongo, wearing a moth-eaten woolly-pully striding through the woods with his dog. I introduced myself and showed him around the site. He found it 'rather interesting' and asked when we'd be leaving. I said Tuesday and he said (snooty posh accent again), 'Oh, no, that won't do. We're having a gymkhana here on Saturday.' Guess which site had to move.

The ground crew are the guys who deserve the credit for the success of the Harrier force. They were wonderful, loading and unloading the trucks, setting up the sites, beer tent first, of course, and servicing the

Some of the damage sustained by XV748 as a result of a bird strike.

aircraft in all sorts of weather. I even saw them change an engine in the field. You have to remove the wing first! Wow! Then they packed everything up after the pilots flew away. So, of course, we organized weekend barbecues and cabarets for those guys. My job was cooking the smoked pork chops and (posh accent) flambéed bananas with Grand Marnier. At the cabarets for some reason everyone seemed to enjoy my rendition of 'Alice's Restaurant', a rambling 18-minute anti-Vietnam War folk song. No doubt the *Warsteiner* beer helped.

Near Mishaps

Life on the Harrier Force wasn't without incident. While flying aircraft XV738 I plowed into a flock of birds about 20 miles south of Gütersloh, incurring at least six bird strikes. The inner windscreen was shattered, the outer one was cracked, and the engine made a loud buzzing sound. Easy-peasy with the Harrier – just set the throttle at 85% and regulate airspeed using the nozzles. After landing safely, SEngO said the engine had about five minutes left before failing. The aircraft was unserviceable for a year with engine and airframe damage. Almost earned my Martin-Baker tie that day.

Another day I was happily tootling around the circuit at Gütersloh enjoying doing VSTOL stuff when the main undercarriage indicated unsafe. Only three green. Easy-peasy with the Harrier – do a vertical landing on the pad. As I was in the hover getting lined up for my descent, a calm voice came over the radio (insert Scottish accent here), 'Now, Don, remember when you land to leave the nozzles down because if you move them aft, you won't have any brakes and you'll go off the pad.' I never would have thought of that. Thank you, OC Ops Wing, then-Wg Cdr Jock Heron! I received a Good Show award for

that. I was hoping for a knighthood, but the paperwork must have gotten lost somewhere at MOD HQ.

Weapons Employment or Lack Thereof

During A-7E student training, on our course weapons detachment, the graduation flight load was six live Mk 82 500-pound bombs and a pod of 5-inch rockets to be delivered on tactical targets – old AFVs, trucks, dummy SAM sites, etc. Real ordnance! Such a thrill! In doing so we also learned how much more careful you have to be when flying a heavily loaded aircraft. There really is a difference in handling, especially in a high-wing-loaded aircraft. We had similar strike training when the air wing was preparing to deploy. Lots more live bombs! In almost three years with the RAF, the only ordnance I dropped that weighed more than five pounds was one 1,000-pound inert bomb on a detachment to Decimomannu. Budget and live-ordnance range restrictions, I guess, but a training shortcoming in my opinion.

Being accustomed to the wide variety of ordnance that the A-7 could carry and the many different delivery patterns, I was surprised that the wartime ordnance selection for the Harrier was limited to BL755 cluster bombs, 1,000-pound iron bombs, SNEB rockets and 30 mm cannon. Peacetime bombing practice was all with inert 5-pound bombs only delivered in a 10-degree dive with a 200-foot release – with no radar altimeter. I think that would have been ugly against Soviet anti-aircraft artillery systems.

Things I Really Liked About the Harrier and the RAF

The Harrier used True North for heading instead of Magnetic North. This saved a lot of time and prevented math mistakes when dealing with magnetic variation.

The color-coded weather system – blue, white, green, etc, was so easy to interpret, especially on a wall map as you could watch weather patterns as they moved across Europe.

The use of QFE for the altimeter setting. When you were on the ground, the altimeter read 0 feet, as opposed to QNH which gives field elevation. This also reduced the mathematical workload in the cockpit.

Bar books in the mess. Friday curry in the mess. Sunday chicken and chips in the mess. English beer in the mess – or did I not mention that already?

Tourex 1980 – 'change of command ceremony'.

Things I Really Didn't Like About the Harrier and the RAF

Not a single thing, although I was disappointed to have to return my sexy RAF fighter pilot wristwatch when I left.

End of the Tour

All good things must come to an end, and in April 1980, probably to the relief of the Harrier Force, I had my 'change of command', where I was replaced by Lt Greg Lane. In the photo, you'll notice a smiling observer – Jock Heron again.

Achievement of Objectives

Let's review the list to see how well I did.

1. Return to US Navy in one piece. Accomplished, despite VSTOL flying, field deployments, pub crawls, winter survival school and driving on the 'wrong' side of the road.
2. Don't cause an international incident. This was a close-run thing during a late return to the West Side from East Berlin.
3. Don't break anything. Failed. Did serious damage to XV738 and its engine.
4. Learn to appreciate English beer. Accomplished heroically, but I still need refresher visits to UK to ensure my proficiency meets RAF standards.

'Take lots of photos of castles – and bring back a princess.'

5. Take photos of castles. One of my favourite missions. I wasn't very good at finding small armoured vehicles hidden under camouflage netting, but if the GLO needed a shot of an enemy castle, I was the guy for the job.

6. Bring back a princess. After leaving Gütersloh, I went back for the final exchange event of my RAF career, getting married at All Saints Church in Wittering, to Fg Off Susan Tudor, aka Miss Brtvkorngandlmnade. We are now at 39 years and four kids later. The fairy tale continues.

Afterword

So, what did the RAF give me to take back to America? A deep appreciation for doing the best you can with what you've got. Your average Harrier pilot had excellent airmanship skills and low-level tactical ability, despite the Harrier's avionics limitations. You didn't whinge about things, but just got on with it and did the job. This especially impressed me when reading Jerry Pook's excellent book, *RAF Harrier Ground Attack: Falklands*.[3]

By the time I got home, I had acquired a decent British accent and a new wife. I told my Navy colleagues the truth about my RAF adventures, but no one believed me. The things the Harrier Force took for granted were extraordinary to me.

I've been happy to maintain close ties with RAF friends through

emails, Christmas cards and reunions, coupled with visits to in-laws. I've read obituaries – Bill Green, Hoppy, Slats, Binns, Pete Collins, and of course, Sir Peter. These cut me to the heart because we were all so close. We were bulletproof back in those days, weren't we?

I was privileged to do some wonderful things in my Navy career – I commanded a Hornet squadron, met Ronald Reagan, and was Naval Attaché in Paris, but nothing causes me more sentimental emotion than my time with the RAF.

I keep an autographed Harrier print in my study as a lasting souvenir of a very special time in my life. Of course, Jock Heron's is among the many signatures.

I appreciate that I was part of an exclusive fraternity that welcomed me warmly, gave me a bit of culture, teased me a lot, but took good care of me, and still is a huge part of my life. Thank you for your kindness and patience with this very grateful 'Navy Yank in the RAF'.

Notes:

1 Marston, Bob; *Harrier Boys: Volume 2: New Threats, New Technology, New Tactics, 1990 - 2010* (Grub Street; 2016).

2 Johns, Sir Richard; *Bolts from the Blue* (Grub Street; 2018).

3 Pook, Jerry; *RAF Harrier Ground Attack: Falklands* (Pen & Sword; paperback reprint 2011).

THE RAF REGIMENT – USAF SECURITY POLICE FORCES EXCHANGE PROGRAMME

by Wg Cdr Martin Hooker, Lt Col Gregory DeGruchy and Wg Cdr Michael Fonfe

Martin Hooker was commissioned in 1969 and specialised on Tigercat and Rapier, commanding No.26 Sqn RAF Regt at Laarbruch and being Head of the RAF GBAD Branch in MOD during Gulf War 1, before moving on to wider Force Protection and CBRN Defence roles. He served in British Honduras, Germany, Hong Kong, Cambodia, the Falklands, the USA and twice in Afghanistan. Although not an exchange officer per se, *he served three tours with US Forces at Ramstein and in Norfolk VA. He retired from active RAF service in 2005 to become the RAF Regt's Regimental Secretary, a post he held until 2017.*

INTRODUCTION – Wg Cdr Martin Hooker

The RAF Regiment and USAF Security Forces Exchange Programme celebrated its 50th Anniversary in 2016. This joint paper will provide a brief summary of the recognition of the need to protect the integrity of air installations, the creation of appropriate dedicated forces, personal insights and, finally, an overview of our exchange programme itself.

The RAF was only three years old when Italian General Giulio Douhet identified a problem, when he wrote that, 'It is easier and more effective to destroy the enemy's aerial power by destroying its nests and its eggs on the ground than to hunt his flying birds in the air.'[1]

Twenty years later, Prime Minister Winston Churchill provided a solution when he observed that, 'Every airfield should be a stronghold of fighting air-groundmen, and not the abode of uniformed civilians in the prime of life protected by detachments of soldiers.'[2]

The Catalysts

Following Dunkirk, and with the need to reconstitute the decimated British Army, the RAF found itself devoid of dedicated airfield defence troops. Army airfield defence units were simply removed without any warning or debate. Following the calamitous loss of Crete in May 1941,

The inability to prevent the Germans from securing airheads on Crete in 1941 led to the creation of a dedicated force – the RAF Regiment.

Churchill directed that every airman had to be an airfield defender, which eventually led to the formation of the RAF Regiment on 1 February 1942.

Some 22 years later, General William Westmoreland, the US Commander in Vietnam, would come to the same conclusion, because the US Army was too busy fighting up-country to be able to provide troops to protect USAF air bases, leaving them vulnerable to ground attack. His concerns were well-founded. Between 1964 and 1973, the Vietcong (VC) and North Vietnamese Army (NVA) attacked South Vietnamese airfields 475 times, resulting in the destruction of 99 aircraft and operationally affective damage to a further 1,170.[3]

Ground Defence a Low Priority

For the USAF, air base defence had been a low priority. Few air bases had more than a handful of Security Police law enforcement personnel and little in the way of perimeter and sector defences. Furthermore, the Republic of Vietnam Air Force (RVNAF) was notoriously poor in its control over base access. As an example, in the autumn of 1964, Tan Son Nhut had only six Security Police vehicles to patrol a 16-mile perimeter – and the VC was becoming increasingly skilled at identifying where weaknesses lay.

Increasing Threats

Following the Gulf of Tonkin incident in August 1964, USAF

Bien Hoa, 1 November 1964 – a damaged B-57B, with the remains of another in the foreground.

commanders became increasingly concerned over the VC/NVA's potential to mount air base attacks.[4] The RVNAF was asked to provide additional base security forces and the commander of the USAF 2nd Air Division ordered a squadron of B-57s at an overcrowded Bien Hoa AFB, to recover to the Philippines. On 1 November 1964, infiltrating at night, the VC attacked Bien Hoa. From some 400 metres outside the perimeter, and armed with just six 81mm mortars, they launched 83 high explosive rounds into the airfield where the twenty remaining B-57s were parked. Five of these aircraft were destroyed; eight were heavily damaged with a further seven receiving light, but operationally significant, damage. In just 20 minutes, an entire B-57 squadron had been rendered non-operational by a small enemy force, which withdrew without loss.

Lessons Learned

Lessons were learned, of course, but the USAF lacked expertise in the fundamentals of air base defence and was incapable of providing the radical improvements in the active and passive defence capabilities that senior commanders were demanding. Finding a solution to the problem fell to Lt Col William 'Wild Bill' Wise, a USAF Security Policeman and former WW II Army Ranger. In late-1965, he participated in a security survey of facilities in Vietnam conducted by

the USAF Inspector General. The subsequent report recommended the creation of a dedicated Combat Security Police Unit with training to be provided by the US Army Ranger School at Fort Benning GA. This underpinned what became Operation SAFESIDE.

Birth of The Exchange

Bill Wise identified – reportedly from his wartime experiences in NW Europe – the RAF Regiment as a model organisation for the project. Within months, negotiations between the MOD and the Department of Defense had resulted in the establishment of the RAF Regiment – USAF Security Police Exchange Programme. The first course was held in May 1966 and the first RAF Regiment exchange officer, Flt Lt Trevor Wallis, was in post by July. His first task was to re-write the lesson plans for the course. The first USAF Security Police Squadron – the 1041st – deployed to Vietnam in early January 1967.

THE USAF SECURITY FORCES (SF) PERSPECTIVE – Lt Col Gregory DeGruchy

Lt Col Greg DeGruchy is a 2004 ROTC graduate from the University of Central Florida. He is a career Security Forces officer and has commanded at squadron level at Thule and Los Angeles. He deployed twice in support of Operation IRAQI FREEDOM and attended the Air Command & Staff College at Maxwell AFB. As a USAF exchange officer, he is currently SO2 of Strategic Plans with the RAF Force Protection HQ at Honington where he also provides coordination for the bilateral relationship to inform commanders of future developments across both services on Force Protection.

Of Mutual Benefit

As previously noted, our US/UK relationship is now over 50 years old and has greatly benefited both sides. Indeed, if you delve into how the USAF conducts air base defence, you will find much evidence of RAF Regiment standards of employment and concepts. This is due to the Exchange Programme.

One of the greatest changes in US air base defence came in the form of the 820th Base Defence Group (BDG) which has now become one of the premier force protection organizations in the world.

The Khobar Towers, Saudi Arabia, 25 June 1996.

The SAFESIDE Programme Revisited

Following the US withdrawal from Vietnam, the priority that had been afforded to the practices and procedures required by Operation SAFESIDE declined until 1996, when a terrorist attack at Khobar in Saudi Arabia refocused attention on security issues.[5] In 1997, Brig Gen Richard Colman (its Director at the time) merged law enforcement and ground defence specialities and renamed his pre-existing Security Police Force to create the dual-capable Security Forces.

It was also recognized that the USAF needed a 'break glass in case of emergency' style base defence force that could deploy rapidly. The result was the establishment of the 820th BDG, which clearly reflected RAF Regiment concepts, with former exchange officers, such as Col Don Derry, being involved closely in its formation.

Proven Worth and Potential

If it were not for the US/UK relationship, continued after the Vietnam conflict, the development of the Security Forces organization would have been very different. Since the Exchange Programme began in 1966, during the Vietnam conflict, the USAF's overall mission successes for the past 53 years have benefited from having the most secure airfields in any conflict they were involved in, and the role that the Security Forces have played in that success has been recognized by the Chief of Staff in 2019 by declaring this 'The Year of the Defender'.

The long-term exchange of USAF Security Forces and RAF

Regiment officers has seen two from each service cross the Atlantic to serve in each other's headquarters, field units and schools. Today, for example:

- The senior USAF SF officer (currently Lt Col Greg DeGruchy) serves on the RAF AIR FP staff and writes future plans for the RAF Force Protection Force.
- The junior USAF SF officer (currently Capt Robert Ippolito) undergoes the RAF Regiment's selection and training course – the JROC – and, upon graduation, leads the specialist training courses in the RAF Regiment Training Wing.
- The RAF Regiment senior officer (currently Wg Cdr Chris Berryman) works at the Pentagon under the Director of Security Forces writing future plans, just as the American does for the British
- The junior Regiment officer (currently Flt Lt Chris Bradshaw), for the first time, has been assigned to an operational unit within the 820th BDG and will serve as the 824th BDS's Operations Officer and Second-in-Command.

Taken together, these officers are in ideal positions to influence and change both Services for the better and ensure their continuing success. The future holds unlimited potential for the force protection exchange programme to grow. It is currently facilitating a multitude of annual exercises, such as GLOBAL EAGLE and MOBILITY GUARDIAN. The exchange officers are also investigating potential future opportunities, such as flight-line security interoperability at Exercise RED FLAG, and we maintain the long-established traditions of competing in the RAF Regiment's Operational Shooting Competition and the SF's DEFENDER CHALLENGE.

Information and Technology Transfer

Technology has created a mutually supportive area for information exchange in the context of, for example, Unmanned Aerial Systems (UAS), Counter-UAS, and C2 interoperability. In addition, there are opportunities for further relationship-building within USAFE via increased attendance by individuals on each other's training courses dealing with, for instance, law and order and agile basing concepts. All

of this is made possible due to the exchange program which underlines why these last 53 years have been so beneficial to both the RAF Regiment and the USAF Security Forces.

The Chief's Overview

In the words of Brig Gen Tullos, the current Director of Security Forces:

> 'The Air Force's Security Forces doctrine, tactics, techniques, and procedures are as strongly rooted in the lessons learned by our counterparts in the RAF Regiment as they are derived from our American ground forces. We've been coalition partners with them since we were born out of the Army Air Corps at the end of World War II and I daresay I don't foresee a future conflict where we don't share the battlespace with our wingmen in the Regiment.'

THE RAF REGIMENT PERSPECTIVE – Wg Cdr Michael Fonfe

Mike Fonfe graduated from Cranwell in 1967 with the Sword of Honour and served in Aden, Bahrain, Malta, Germany and South Africa. Qualifying as a Royal Artillery Instructor in Gunnery, he was involved in the Joint Service Rapier Arctic Trials in Canada and commanded No 15 Sqn RAF Regt. Following the Falklands Conflict, he staffed the captured Argentinian Skyguard-Oerlikon AAA into RAF service, and then commanded the first squadron. He had an exchange tour in HQ USAF's Air Base Defence Staff in Albuquerque NM, before joining the then NATO Reaction Force (Air) Staff in Germany. He ended his RAF service in South Africa, as an adjudicator to the South African Armed Forces, in 2000.

Move Across the Pond

I joined the Exchange Programme in 1989, two decades after it began. At that time the USAF had 40,000 security personnel worldwide and had created a concept which provided high-threat regions with individual reinforcements of more heavily-armed, specially trained personnel, as opposed to the British preference for deploying formed squadrons.

My posting was to the HQ Air Force Office of Security Police, a

USAF Security Forces and RAF Regiment on a joint exercise.

Pentagon staff out-stationed to Kirtland AFB at Albuquerque NM, where 20,000 scientists and servicemen worked on the cutting edges of science, weapon development and, of course, military security.

Entering the Whirlwind

During my tour, I experienced a whirlwind of exposure to five areas to which Lt Col DeGruchy made some reference: competition; policy manual drafting; expeditionary warfare, in Panama; Cold War air base defence outside NATO, in Korea; and a second expeditionary conflict – Gulf War I. In addition to specific direct contributions to the USAF, the UK-side of my job was to feedback details of areas of research and technology developments relevant to air base protection.

Defender Challenge

On arrival in post, I found myself immediately involved in the USAF's air base ground defence exercise equivalent to RED FLAG – DEFENDER CHALLENGE – an international live-firing, patrol skills competition using exclusively American weapons. The Security Police General and his entire staff took two weeks out of the office to run this

competition in which the Regiment still performs extraordinarily well. We, in return, run an equally fiercely-contested reciprocal competition using only British weapons in the UK.

New Air Base Defence Manual

My colonel boss, a former exchange officer himself, immersed me in the combat experiences of my US colleagues in Vietnam, the Philippines, Africa and the Middle East. With the 1983 suicide-bombed US Marine intervention in the Lebanon very much in mind, our task in 1989 was to write a new Global Manual of Multinational Air Base Defence, catering for under-resourced host nations in a hostile operational environment.

We brainstormed a capability review of donor and host nation's forces, including issues such as how to overcome language difficulties and create a single ground force chain of command with a common defence plan and rules of engagement. The problems we faced, as now, were legion. For example:

a. The impact of constantly rotating personnel on command and plans, highlighted the need for constant review, re-briefing and rehearsal.
b. Airfield perimeters, rarely sited for tactical significance, are often complicated by nearby civilian buildings and, of course, suicide attacks, last employed by the Japanese in 1945, were back.
c. When fire is exchanged and bullets start to fly, there is a high-level risk to exposed individuals and of collateral damage to aircraft and vital equipment. The enemy might wear friendly-force uniforms and commandeer vehicles. Such incidents would be fast, furious and dangerous, and often recorded live by the media – or, increasingly, individuals with smart phones . . .

The solution to all of these requires a speedily reactive, heavily-armed response force; it is not a job for a 'GI Joe' from an ordinary infantry battalion of the line or for an armed technician-guard. Remember, we were writing this a decade *before* 9/11, Iraq and Afghanistan. This was the leading edge of USAF doctrinal thinking that I took back from my exchange tour to my subsequent postings in the UK and NATO

The Invasion of Panama

My air expeditionary experience was through USAF HQ oversight

Panama 1989 – a C-5 disgorging an MH-53J Pave Low III.

of the American invasion of Panama to topple President Noriega and secure the Canal, in effect, a re-run of Suez without Anthony Eden's political chicken-out at the end, all conducted with the intensity of the Berlin Airlift. The Panama air base defence was straight out of our manual, protected by the US Army, US Marines and USAF. One night, however, the entire US Army sector battalion simply vanished, without so much as a word, on another mission; that may sound familiar to some. Luckily, it was spotted by the USAF commander on his graveyard-hour inspection and quickly made good.

Exercise REFORGER

I was also lucky enough to umpire a biannual US Cold War reinforcement exercise to Korea, where the North has a million-man army, including a very large Special Forces element equipped with an armada of An-2 Colt biplanes and miniature submarines. The combined South Korean/USAF base defence was formidable, far exceeding our preparations in NATO.

In my capacity as an umpire, while at Kunsan AFB, I had to intervene to stop USAF 81mm mortars, manned by armourers, live-firing illumination rounds while aircraft were flying around the airfield, because they were unaware of the danger of falling discarded nosecones

'We'll be OK here, guys. We're going to be working together with the RAF Regiment.'

and tails both to aircraft in flight and to personnel on the ground. That night, I helped the USAF draft proper Mortar Standard Operating Procedures, with a recommendation that USAF personnel attend professional US Army mortar courses. Just for the record, the illumination was a trial that I had initiated to demonstrate that we could engage Korean Special Forces An-2s with Stinger at night – a classic example of exchanging ideas.

Textbook Co-operation

Uniquely, our exchange programme has generated extensive personal contact. I can illustrate how this pays off in the field with just one personal anecdote from the Gulf War. When the first reinforcing American F-15s and their accompanying C-130 (with the USAF Base Defence officer from across my Kirtland desk aboard) arrived at a remote Saudi air base, the ramp went down and he was greeted by a heavily armed Land Rover manned by four 'Rock Apes'. He turned to his troops and said, 'We'll be OK here, guys. We're going to be working together with the RAF Regiment.' That pretty well sums up the value of our exchange.

The Commandant General's Overview

The words of Air Cdre Frank Clifford, currently Commandant General RAF Regiment, echo those very same sentiments thirty years after my tour:

> 'The exchange program is a key part of UK Defence Business. Knowing how to operate with Allies, sharing ideas and ways of delivering combat power, together with building trust and mutual respect are all essential long before any conflict may start. The Programme has paid dividends time and again in the cauldron of operations; lessons have been hard-learnt and shared procedures refined, based upon an understanding that our personnel – and those we defend – are better defended through the work of those who have been engaged in the Programme.'

All in all, my exchange tour was a great personal and professional experience, leading to lifelong friendships across the Atlantic.

SUMMARY – Wg Cdr Martin Hooker

The underlying value of our well-founded and enduring exchange is that every single airman, NCO and officer, on both sides, has seen, been trained by, or worked with, a member of the other Force Protection organisation. On operations, they are very likely to meet each other in the field and, capitalising on the bonds previously forged, they will work together better, with a greater understanding and appreciation of each other's capabilities.

Both nations' Force Protection forces are now more closely professionally aligned and connected than ever before, cemented together by the glue of effective liaison and cooperation in recent kinetic campaigns, a synergy that will be essential in future shared operations.

50th Anniversary Celebration

Finally, although our exchange reunions have been regular over the years on both sides of 'the Pond', the 50th Anniversary in 2016 was celebrated in particularly fine style with a week-long schedule of engagements, culminating in a Reception at the House of Lords hosted by the Baroness Harris of Richmond, with US Army General David Patraeus – then Commander CENTCOM – and other senior figures in attendance, followed by the Queen's Birthday Parade in London.

'Comrades in Arms' – some of its veterans celebrating the 50th Anniversary of the RAF Regiment – USAF Security Police Forces Exchange Programme in 2016.

The RAF Regiment – USAF Security Force Exchange Programme has produced true Comrades in Arms over the past 53 years; we look forward with pride to the continued friendship and cooperation.

Notes:

[1] Douhet, Gen Giulio: *The Command of the Air*; originally published in 1921, it is still in print, since 2015, via Amazon's Createspace on-demand publishing platform.

[2] Churchill, Winston S: *The Second World War, Vol III* (Cassells, 1950).

[3] Vick, Alan: *Snakes in the Eagle's Nest – A History of Ground Attacks on Air Bases* (Rand Corporation, 1995).

[4] On 2 August 1964, North Vietnamese torpedo boats attacked an American destroyer, the USS *Maddox*, in the Gulf of Tonkin. Following a further attack on 4 August, President Johnson authorised retaliatory air strikes against North Vietnam and the US's involvement in the war escalated from then on.

[5] The Khobar Towers incident was a terrorist truck-bomb attack on 25 June 1996. Nineteen USAF personnel and a Saudi local were killed and another 498, of many nationalities, were wounded.

COASTAL AND AMERICA

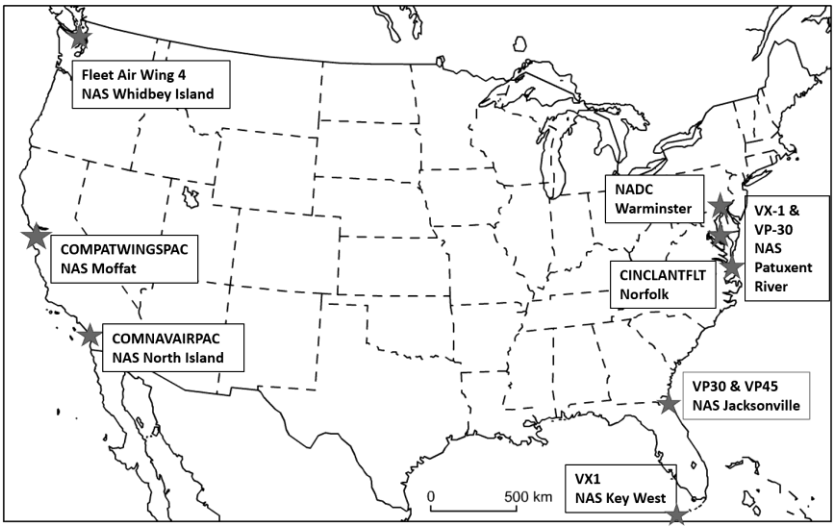
by Sqn Ldr Bob Hall

Bob Hall joined the RAF in 1965. A navigator, he flew Shackletons (No 203 Sqn), Nimrods (No 120 Sqn) and, during a 1975-78 USN exchange tour, Orions. Following a spell at Northwood and qualification on the ASW Sea King, he joined the staff of FOST, interrupted by an eight-month stint with No 814 NAS during the Falklands War. After another Nimrod tour, there were further ground appointments at Kinloss, Gibraltar and Northwood. A year after leaving the service in 2005, he joined the RAF Reserve as the Assistant Regional Commandant for London & South East Region of the Air Cadets. He finally retired in 2016.

I am indebted to my RAF and USN colleagues[1] for conversations, comments and information on their experiences, but the interpretation and words are entirely my own. This paper concentrates on the Maritime Patrol Aircraft (MPA) role of Coastal Command and its successor formations[2] and not the Maritime Strike/Attack (Buccaneer/Tornado) or Search and Rescue (helicopter) roles, although these also had exchange posts with the US Navy and Coast Guard respectively, and both do get a brief mention.

I have not been able to find the official start date of Coastal Command exchanges with the US Navy. However, there were certainly USN officers flying with Coastal Command in World War II. Indeed, it was one of these, Ensign Leonard B Smith, of 209 Squadron who relocated the *Bismarck* on 26 May 1941 (some six months before America entered the war) thereby enabling her sinking. Smith and two other USN officers (flying with Nos 210 and 240 Sqns) involved in the relocation and sinking that day had, after delivering Catalinas to the UK, remained to familiarise RAF crews with operating the aircraft. They were, therefore, flying operational sorties unofficially. Moreover, once America was in the war, both USN and USAAF squadrons flew from the UK under the Operational Command of Coastal Command.

Notwithstanding not knowing the formal start date of the overall programme, the pilot exchange post on VX-1, then based at Key West



The locations of MPA-associated exchange posts in the USA.

in Florida, is known to have started in 1948, which confirms the anecdotal start date of 'the late-1940s' given to me by my older maritime colleagues, some of whom were on the early exchanges.

Initially, the posts were all in HQs, Trials and Evaluation (T&E) and Tactical Development units, but since the 1970s have included front line and training squadrons as well. The accompanying map shows where these exchanges have been.

They include Naval Air Station (NAS) Whidbey Island (Commander Fleet Air Wing 4 [FAW4]), NAS Moffett (Commander Patrol Wings Pacific [COMPATWINGSPAC]) and NAS North Island, San Diego (Commander Naval Air Pacific [COMNAVAIRPAC]) which were all HQ appointments. But why on the West Coast, because the Pacific is a totally different ocean, from an ASW perspective, compared to the RAF's Atlantic 'home waters'? I have been unable to find the answer to that one.

The flight lieutenant pilot post on FAW4 started as part of the supervisory training team but was switched to an ops support role, checking operational crews about to deploy to Alaska. It included a small amount of flying on SP-2H Neptunes. One incumbent's duties also included liaison with an underwater surveillance station, which

later transpired to be a ‘No Foreigners’ (NOFORN) activity. However, as he had already been doing it for some time, he was allowed to continue on condition that he did not brief the RAF! In 1970, as part of a USN reorganisation, the post was transferred to NAS Moffett and, because of NOFORN issues, ended up in COMPATWINGSPAC. There it became part of the Tactical Development Team and, switched from pilot to navigator, it was eventually upgraded to squadron leader. NOFORN was still an issue, but, as incumbents became known, they were treated, if only informally, as one of the team and the problem reduced. As a squadron leader post it was filled by navigators and AEOs and continued as part of the tactical team; although, many years ago, somebody told me that all he did was ‘count sonobouys’. The post continued into the 1980s, but then stopped, presumably after failing a review of exchange appointments.

In the 1970s and ‘80s, NAS Whidbey Island also hosted a Buccaneer navigator exchange post flying A-6 Intruders, but that too later went elsewhere in the US before it finally ceased at about the time that the RAF stopped the Maritime Attack role. At the same time, Buccaneer pilots had an exchange post flying F-111s at Mountain Home AFB with the USAF. The SAR helicopter exchange was based in Southern Florida.

The wing commander post at COMNAVAIRPAC at NAS North Island has been described to me as, ‘routine administrative duties with some visits to shore bases, but no flying.’ Because of the mundane and undemanding tasks allocated to an incumbent in the early/mid-1970s, he recommended that this exchange post could be better used elsewhere, and it had been stopped by about 1978.

Although the MPA posts on the Pacific coast were socially pleasant, they were undemanding and of little relevance to the Atlantic. Therefore, if cuts had to be made or better opportunities became available, they were the obvious ones to go.

The squadron leader post at CINCLANTFLT in Norfolk, Virginia was, and remains, fully integrated into USN operations against the Russian submarine force.

The pilots on VX-1, first at NAS Key West and now at NAS Patuxtent River (‘Pax’), were employed on a variety of trials work, such as multi-statics and an advanced MAD programme. They have since been joined by navigators, WSOs and WSOps (both wet and dry) and

all are concentrating on the P-8 Poseidon. There were some issues with NOFORN on the base at Pax River but, on the squadron, the CO was briefed that there was to be no separation of USN and UK staff and that the latter were simply to be treated as US Nationals.[3]

The Aerosystems Course-qualified RAF navigators at the Naval Air Development Center (NADC), Warminster, Pennsylvania were involved in systems development before a system went to the Naval Air Test Center (NATC) for safety testing and then to VX-1 to be checked for operational effectiveness, sometimes by our exchange pilots. Typically, they looked after software development and support for the P-3C and they held the chair of the P-3C software operational advisory group. This post ceased many years ago, but those to whom I spoke did not know why.

At least one of the pilots at VX-1 had a proper debrief on his return and had to write an operational report, but I did not, and nor did any of the others to whom I spoke – and very few were immediately employed in a post which specifically took advantage of their recently acquired experience. Surely wasted opportunities to exploit knowledge and experience.

I was posted to the CTTO LRMP Cell at Northwood, alongside HQ 18 Gp, working in the soon-to-be-superseded Nimrod MR1 office, but I was rarely consulted by the team introducing the Nimrod MR2. With over 1,000 hours on the P-3C, many of which were operational using Link 11, FLIR and a more advanced acoustic system than the Nimrod MR1's, my useful, and recent, experience was quite extensive. The acoustic aspects were, perhaps, less relevant, but with Link 11 being planned for the MR2 the lack of consultation in that respect was surely a lost opportunity.[4] However, as a counterbalance, CTTO's LRMP Cell maintained a very close working relationship with VX-1 and the NADC, built up through the years of the Exchange Programme with annual visits to each location and this proved very useful. One hopes these links are still being maintained by today's Air Warfare Centre.

While few participants in the Exchange Programme were immediately employed in posts which took specific advantage of the experience that they had recently acquired, most people were able to make use of it during their remaining time in the service. I will offer three examples. First, one of the officers who had served at COMPATWINGSPAC later became Station Commander at RAF

The badge of VP-45.

Machrihanish where three USN units were based. He spoke their language, was tolerant of their relaxed methods and, most useful of all, renewed contacts he had made ten years earlier, including the admiral in Iceland who, as a commander, had been his Boss at Moffett. Secondly, my pilot colleague on exchange with VP-45 was the Nimrod Detachment Commander in Oman during Gulf War I when the USN carrier group made an informal request for UK maritime reconnaissance assistance. He knew exactly what they needed and how to ensure the approval of the USN's higher tasking authority. To quote him, 'It worked a dream.' Furthermore, he understood the capabilities of the US systems, which many of the UK's commanders, some senior, did not.

Finally, I would cite my own case. In 1986 I led a two-week operational Nimrod detachment to Sigonella where the CO of the deployed P-3Cs was a colleague from my time on exchange; the admiral in Naples had been my CO on VP-45 and his COS had been one of the Department Heads. Renewing these contacts made bedding-in at Sigonella and the subsequent operation very straightforward. Similarly, my previous experience of working with the Americans eased the task of establishing a small Nimrod detachment in Bahrain in July 2001. All of which finally leads me to my exchange on VP-45.

In early 1975, along with a pilot and two flight sergeant AEOps, I was selected to become the second, and as it turned out last, group of four Nimrod aircrew to serve on the USN front-line. We were all specifically chosen because we were bachelors. I was told that this was in response to the first group saying that the USN deployment schedule was too tough on the wives and families. Having since spoken to the pilot in that group, I now know that they never actually said that! It must presumably, therefore, have been a reaction on the part of the concerned staff at Barnwood[5] to an assessment, or comments, made by the military staff at the Embassy in Washington.

The experience of the first four-man team had been unfortunate in that their conversion onto the P-3C had been at Pax River and none of them had had any real help from their sponsors who had sourced, barely

adequate, trailer (caravan) accommodation for them, their wives and children, but nothing else. In one case, the trailer was totally unacceptable with respect to both standard and location and the individual concerned had to arrange alternative accommodation himself. Apart from booking a few days in a hotel on arrival at Pax, while the accommodation formalities were completed, they had received no help from the Embassy (only 70 miles away) in sorting out doctors, dentists, schools, etc for the families.

Although they were allocated squadron hosts on arrival on VP-45 at Jacksonville, Florida, these individuals again did nothing to assist in the search for housing, doctors or schools and, yet again, the Embassy offered no help. Moreover, having been advised by their COs, before leaving the UK, that there would be only one deployment, once they reached VP-45, they learned that there would actually be two. That meant that they had little time to adjust to their new environment before being detached for five months, at home for eight and then away for another five. In their first few months the wives did not really get to know many of the American wives and had not become embedded within the local social life before their husbands deployed. Their sense of isolation would not have been helped by the, then normal, practice of many of the Navy wives taking themselves and their children 'back to mum and dad' while their menfolk were away. It would be fair to say, therefore, that the British wives felt somewhat abandoned in a place they did not really know.

Although the four of us in the second contingent, were bachelors when selected, one of the AEOps had married not long afterwards and was only just in the process of telling the RAF. Despite his changed circumstances, he was still allowed to go – on the understanding that he and his wife did not complain and that his wife learned to drive! The pilot also had a steady girlfriend, soon to be wife, and I had met my future wife. Thus, by the time we had been in the States for ten months, the original four had become seven, a situation happily accepted by both the squadron and the Embassy staff.

In our case, conversion was at Jacksonville ('Jax') and we joined the squadron at the start of a twelve-month period at home. Also, unlike the first four, who had had little off-duty interaction with their squadron colleagues, we had regular social contact within the squadron, which meant our spouses were well-established by the time we spent our two

A Lockheed P-3C Orion of VP-45.

five-month deployments away from Jax.

Even though we were on the OCU, we were allocated individual squadron sponsors by VP-45 and, because the squadron was actually away at Sigonella at the time, they had each arranged local substitutes from the OCU. The pilot arrived in the USA a month before me and the AEOps. His hotel had been pre-booked by the Embassy. His *de facto* sponsor was another student pilot on the OCU who was also bound for VP-45. While not ignoring my colleague, his sponsor was less helpful than he could have been. In my case, however, my sponsor's stand-in met me at the local airport and took me direct to my accommodation – which was actually my 'real' sponsor's apartment on a temporary loan/sub-lease until he arrived back from deployment; he also leased me his car. Both of these facilities had been offered and accepted before I left the UK. This, therefore, gave me some four months to make my own arrangements. My temporary sponsor also looked after me very well with my arrival on base (obtaining passes, etc) and I felt well treated. The AEOps too, were very well served by their host from VP-30 and taken to their hotel (also pre-booked by the Embassy) and assisted to find a car.

Our operational conversion was on VP-30, known as the Replacement Air Group (often referred to as the RAG)[6] and lasted from August to December 1975. I found the conversion a bit frustrating, as the instructors tended to assume that, as a third tourist with some 3,000 maritime hours under my belt, I knew all about the P-3C and just needed a quick refresher, like the USN aviators on their second or third tours

who were passing through the RAG at the same time. I had to keep reminding them that I did not! Nevertheless, I got through and the four of us joined the squadron on its return from Sigonella in January 1976. Unfortunately, our predecessors had returned to the UK direct from Sigonella, their wives having been repatriated some six months earlier, before the squadron deployed, so we had no 'Brit-to-Brit' handover.

VP-45 was one of six front line P-3C Atlantic Fleet squadrons based at Jax. There were six more at Brunswick, Maine. This was mirrored in the Pacific Fleet with two bases, Moffett Field, California and Barber's Point, Hawaii, housing six squadrons each and another RAG at Moffett. In addition, there were six squadrons of P-3s in the US Naval Reserve based around the US. Well over 300 P-3s compared to the RAF's 46 Nimrods.

The squadron was established with nine aircraft and twelve crews and was entirely self-contained, with its own maintenance personnel for, what the RAF would call, first and second-line servicing and many other trades too. Many of these assigned enlisted personnel were sent on Temporary Active Duty (TAD) to various units on the base where the squadron was residing, either its Home Port (Jax in our case) or Deployment Base – cooks to the galley, medics to the Sick Bay, some to Supply or elsewhere as appropriate to their rate (trade).

Headed by the CO, ranked as a commander and in-post for a year, there was an Executive Officer (XO), also a commander and also in post for a year and destined to become the next CO. They presided over four Departments each headed by lieutenant commanders on two-year tours: Ops, Admin, Maintenance and Safety/NATOPS, ie Naval Aviation Training and Operating Procedures Standardisation. Every aircrew officer, chief petty officer (CPO) and most petty officers had a day desk job on the squadron, in addition to their flying or maintenance duties. Some, eg Public Affairs, would be considered secondary duties in the RAF, but all were treated as full-time tasks and performance in these posts played the major part in fitness reports and promotion – aviation was a largely secondary consideration. That said, people could, and did, fail annual checks and, although it did not happen in my time, that could lead to loss of 'flight status', with an obvious adverse impact on a career.

1976 was a year of intense training as I built up my experience as, first, a Tactical Coordinator (TACCO), then TACCO Instructor and

Like all, Mission Commanders, on qualifying as such I was presented with model of a P-3C, in my case, specially painted in the markings of the aircraft I took to South America on Exercise UNITAS. These models were provided by Lockheeds, but, not long after this, the practice ceased as a result of the Lockheed Bribery Scandal.

finally Mission Commander. At the same time, I had to learn how to be a Navigator/Communicator (NavComm) as instructing that position was part of the TACCO Instructor role. As a multi-tourist, it had been assumed by the RAG staff, quite rightly, that I would go straight to TACCO, which meant, as with my USN counterparts, other than a brief outline of the systems, I was given no instruction in how to perform the role – particularly the Comms element. That was fine for them, as they had all been NavComms in an earlier tour, but not for me. I asked for, but there was no extra capacity to give me, a dedicated NavComm sortie. Obviously, I learned a little during the training sorties and simulator sessions, but I did not actually sit in the seat as a NavComm until I became a trainee TACCO Instructor!

What of the crews and their experience? The officer instructors on

VP-30 tended to be less experienced than those on the Nimrod OCU, most with only one flying tour behind them, compared to two or many more in the RAF. It was similar on the squadron, with, generally, only the Department Heads, XO and CO having done more than one tour. On both the RAG and squadron the CPOs were experienced, most with three or four tours under their belts. However, the junior sensor operators were very inexperienced and tended to be put on the radar/ESM/MAD station (Sensor 3) and needed to be watched closely by their seniors to prevent them 'doing their own thing' rather than what they had been directed to do by the TACCO or lead sensor operator. I experienced that at first hand on my crew and saw it again 20+ years later when I accompanied a P-3 crew flying out of Bahrain into the Northern Gulf in 2001. Three times in about 90 minutes I had to tell the TACCO that his Sensor 3 was ignoring his direction and doing things with his equipment that were not tactically useful!

On the ground I was the NFO (Naval Flight Officer [Navigator]) Training Officer responsible for organising all NFO air and ground training. The other three RAF personnel also had day jobs, the pilot as Scheduling Officer, planning all the next day's flying, and the two flight sergeants as instructors in the Acoustic and Non-Acoustic Sensor Operators Section – The AWs (Aviation Warfare). Our predecessors had been the Pilot NATOPS Officer, the Training Officer and the AEOps instructors in the AW Section. The pilot was not a QFI but he was, nevertheless, responsible for the flying training and checking of all the pilots from the CO down. It was a post that he could never had held in the RAF but one which he thoroughly enjoyed.

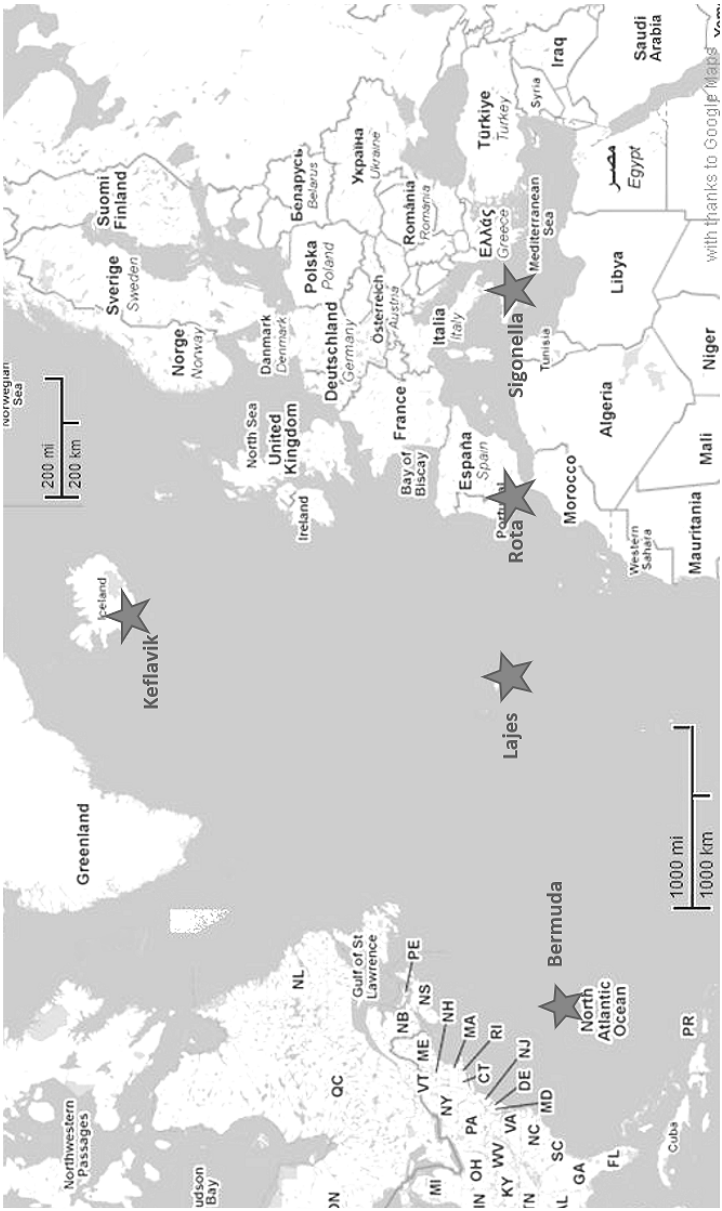
Apart from training flights in my new roles, there were a number of flights to gain 'Quals', the USN system of certifying crews capable of conducting a mission. Many of these were relatively 'canned', but a few were more interesting: aerial mining sorties at Lake George south of Orlando; tracking and attacking a drone submarine 'sled' on the AUTEC Range in the Bahamas (a real submarine if you were very lucky); and tracking and detecting an acoustic target (usually not a submarine, but an unsuspecting transiting merchant ship) in cooperation with an undersea surveillance station. Pilot training sorties had a minimum crew and never took a navigator, it was all pilot nav. Therefore, I did very little flying over the States. There were a few surface surveillance sorties some of which ended in Bermuda.

For the four of us, the last half of the year was also busy as ground instructors, preparing the squadron for deployment to Iceland, including teaching the procedures used in NATO – as our predecessors had done before us and we were to do again before deploying to Sigonella. A diversion from routine and pre-deployment training for me and my crew was a period in Colombia and Venezuela on UNITAS 17 – the annual USN exercise with the navies of South America.

A surprising element of the deployment preparation was the packing up of the squadron. Everything was packed: stocks of paper, pens, typewriters, sonobouys, tools, aircraft spares and even spare engines. These were all loaded into USAF C-141s and conveyed to the deployment site. At the same time, the squadron being relieved was packing and sending all of its stocks of paper, pens, typewriters, sonobouys, tools, aircraft spares and even engines by C-141 to Jax! Hardly the most efficient approach. Both squadrons were going to occupy the space the other had vacated, meaning that much could simply have been left on the shelves with a change of ownership being effected by a transaction on paper.

During our deployments, a major part of the 'hearts and minds' effort by the squadron hierarchy was the establishment of a small duty office on the base at Jax. It was manned by personnel who were due to leave the squadron in the near future or who were just coming out of the RAG before they moved forward after a few weeks or who were to await the squadron's return. All the families were given the contact names and numbers 'just in case'. It was used only occasionally but responded well when needed. I was the recipient of this service when my mother, visiting friends in California, had a heart attack. The message reached me, in Norway, in a matter of hours. The squadron also compiled a monthly magazine, *The Pelican* (our squadron symbol) *Family Gram*, for despatch to the spouses. However, our predecessors had, reportedly, been less well served.

Deploying to Iceland on 26 December 1976, I had the honour to fly the squadron's first operational sortie of the deployment on the 28th with a firm brief from the CO to 'get it done.' All nine[7] aircraft were tried before we finally got airborne in the first one allocated after its propeller seals had been changed. The cold shock of sub-zero temperatures after the warmth of Jax meant that all the aircraft were rather leaky! Why was this a surprise and no pre-emptive action taken?



Deployment bases.

Self in 'my airborne office', taken by an Icelandic reporter who accompanied our flight for a mail drop to the radio and Met staff based on Jan Mayen island.

The next five months were a standard Keflavik ('Kef') deployment of that time: daytime surface search patrols, covertly tracking transiting Soviet submarines into and out of the Atlantic, detachments to NATO bases (Bodø and Kinloss in my case) and training sorties.

Throughout, the daytime desk jobs continued, in my case still as the NFO Training Officer, but also in the Tactics Team. The working week was Monday to Saturday morning. Saturday afternoon and Sunday were time off unless you were flying operations – except for me! As a senior member of the Tactics Team I was responsible for drafting the weekly squadron report to our higher headquarters – Patrol Wing 11 at Jax, and Patrol Wings Atlantic and CINCLANTFLT which were both at Norfolk. I started on Saturday afternoon and having cleared it through, successively, the Tactics Officer, Operations Officer, XO and finally the CO, could release it sometime on Sunday for it to be on the

designated desks in the CONUS by Monday morning. Normally, that process was completed by mid-afternoon on Sunday, but it was not unknown for it to be late on Sunday evening before the CO finally agreed the report. It was *never* cleared by Saturday evening, which meant I worked *every* Sunday while I was at Kef and, except by air, never left the base once throughout the five months.

At Kef we remained part of the Atlantic Fleet so we still had to maintain PATWINGSLANT's routine training schedule, which meant dynamic simulators for the pilots and flight engineers and crew trainers for everybody. This entailed twice having to return to Jax for ten days for a week of 'sims' and a few days leave.

One aspect of USN fiscal management worth mentioning here is the quarterly allocation of a budget for flight hours and fuel and the dollars to go with them. The initial calculations were based on the price of fuel in the US. However, at Kef the price was different, as it was at each of the deployment bases to which crews would be sent. The Maintenance Officer developed a complicated formula that allowed the budget to be managed, depending on the number of times individual bases were visited and the consequent uptake from each. This worked fine until we were tasked to 'turn over' the fuel in the NATO fuel farm at Machrihanish, which was free. The formula couldn't cope with that complication but, more seriously, it meant that the money/fuel/hours were out of balance and explanations were required by higher authority 'back in the USA'. Our sonobuoys and other stores were also issued quarterly, but Soviet submarine activity did not always match these allocations! Therefore, quite often, the home-based units had their allocations reduced, at no notice, with an obvious impact on exercises and training. When home-based at Jax, I recall our being impacted like that a couple of times – but we had also benefited when deployed.

Having returned to Jacksonville at the end of June 1977, training for the January 1978 deployment to Sigonella started immediately and daily life on the squadron was as it had been before the Kef deployment. By this time, I had stepped up a rung and was now the Training Officer, responsible for supervising the teams organising all aircrew and naval training on the squadron. There was another team looking after maintenance training. The pilot continued as Scheduling Officer and, although not a QFI, as one of the Instructor Pilots. While at Kef, the flight sergeant on my crew had stepped up to become the CPO in charge

of the AW Division in addition to his instructional duties. In that role he also became responsible (as a Brit) for the custody and security of all the division's NOFORN documents!

Even though the Nimrod was equipped with the same nuclear depth bomb (NDB) on which both the pilot and I were UK-qualified, the weapon was very much NOFORN. Nevertheless, as Training Officer, I had to arrange the appropriate lessons before the annual squadron check, which was make or break for the CO and others. Come the day of a ground lecture to the squadron junior officers (JOs) I lost track of the time and went to get a cup of coffee from the wardroom, behind which was the classroom. While I was making a fresh pot, the words of the instructor drifted into my consciousness and I soon realised that he was giving incorrect information. What to do, break NOFORN or risk the squadron failing? There could be only one answer – I entered the classroom, told the instructor to sit down, informed the assembled JOs that the RAF was also armed with the US NDB and explained how it *actually* worked! Having finished the lecture, I reported myself to the CO and XO and received a minor wigging and a brief reminder about NOFORN. This was followed a few minutes later by a pat on the back from the XO conveying the CO's thanks! A week later, with no sign of the Brits around, the squadron passed.

Deployments to Sigonella ('Sig') were normally routed via the air base at Rota in Spain, but the US-Spanish third-party agreement was thought to prevent non-US nationals from transiting through Rota, which meant the two crews which had an RAF component deployed via Lajes in the Azores. Only later did we learn that there was a clause which permitted such movements provided application had been made beforehand – I believe that a minimum of six weeks' notice was required. Whether the US would have asked, whether the UK would have allowed the US to ask and, given their sensitivity over Gibraltar, whether the Spanish would have approved, are open questions . . .

The five months in Sig went much as the previous Kef deployment had done, although this time there were diesel submarines to hunt, as well as nuclear ones, and the weather was rather better. Nimrod low level radar tactics worked rather well against the diesels, so the two RAF-run crews were quite successful. The American crews, using standard P-3C tactics, tended to fly too high. In three of the five months, the 'RAF crews' were the MVPs – Most Valuable Pelicans – for our

Self at 'Gib'.

operational performance; two for the pilot's team and one for mine.

For the four of us, NOFORN in Sig was not a problem in early 1978 but, back in late 1975 it had been a major problem for our predecessors. For example, the pilot, despite being the MC and PPC (Pilot Plane Commander), was allowed to fly on only ten of the eighteen operational sorties flown by his crew.

I flew more sorties from Sig than from Kef and, having moved up the 'day job' hierarchy, I no longer had to draft the weekly report, meaning that I had a little time to look around the immediate area of Sicily. I also took the final ISS exam under the invigilation of an RAF squadron leader. I missed out on an operational sortie as TACCO in an S-3 Viking when an RA-5 Vigilante crashed on the runway just as we were taxying for take-off, but I did manage two short detachments to Gibraltar.

A notable series of sorties during the deployment was a Trial called OUTLAW SHARK on which both Brit crews flew some sorties. It was a Link 11 trial to see if tactical data could be linked back to Naples and the US for final attack clearance to be given by higher levels of the Chain of Command (CoC) and for ships or submarines firing anti-ship cruise missiles to plan attack routes to their targets. The aircraft's Link 11 surface and sub-surface tactical picture was transmitted to Sixth Fleet HQ in Naples where it was re-broadcast to ships and

submarines and relayed to the Pentagon and from there to the White House. By return, the appropriate CoC level would send the attack clearance to the 'shooter' – on the two sorties I did, it was a submarine. On my second sortie, I was briefed that the President (Jimmy Carter) would be watching the sortie in the White House Situation Room.

I returned to Jax in July and it was with much regret that I left the squadron in August and returned to the UK after a professionally very satisfying tour. Socially it was rather good too! My wife and I consider it one of my career highlights and I have maintained contact with my USN squadron colleagues and join them every two years at the Squadron Association reunion.

What did the USN learn from me? I can give one example. Heading to the Iceland-Faroe gap, to covertly track a Soviet SSBN, my aircraft's main, and only, computer failed, which meant that I had lost my tactical display. Fortunately, the acoustics system worked independently of the central computer, which meant that we still had a sensor. Nevertheless, the USN SOP would have been to return to Kef, leaving a gap in tracking that should have been continuous. That would have complicated the problem for the crew coming after me, of course, as they would have had to relocate the submarine from scratch. As Mission Commander, I elected to stay on station. I pulled out a skeleton Lambert's chart of the area that I just happened to have in my nav bag and, assisted by a relatively new NavComm, reverted to Nimrod procedures, led ably at the acoustics station by my RAF lead sensor operator. We tracked the target for our 6 hours and passed to our replacement a better handover than we had received – a closest point of approach (CPA) of 500 yards. It was only later that the follow-on crew learned that we had done it without the computer, much to their surprise. Others on the squadron were equally impressed. The Tactical Support Center (TSC) analysis team at Kef were astounded and, on analysis, recalculated my handover to 300 yards. A few days later, with the same aircraft, the same thing happened. This time there was no hesitation; my crew did the same thing again. The lesson? Man *can* operate *without* a computer. For a while squadron crews were talking about reversionary procedures and how they would do them. Although, to be honest, I doubt that lasted long after we left the squadron.

A close USN friend then and now, a TACCO, who flew with the RAF exchange pilot and an AEOp from both groups, told me that he

had learned how to use the radar as an effective ASW search sensor even though it was intended to function as a *surface* search device. He had also adopted the RAF practice of getting out of his seat to look at the sensors himself and to talk to the operators, which USN TACCOs did not do. This last paid off in his later career particularly when, as a Squadron Commander, his crew detected and tracked a particularly difficult Soviet target. He believes that the USN had little to teach the RAF, but that we had a lot to teach the USN, even if only because of our greater experience.

NOFORN was a minor irritant at times, particularly when, early on, I was told that I was not permitted to look at the squadron's copy of the Nimrod tactics manual, because somebody had stamped NOFORN on the cover, instead of UK/US Eyes Only. The petty officer running the library soon had a very positive directive from the XO to allow the Brits access! As with the RAF pilot on VX-1, the squadron was as flexible as possible. I do not recall ever being excluded from a flight until the very end, though there was one type of ASW flight that was limited to only two or three crews (all US) because it required 'very experienced' crews and 'special' training, and nobody discussed 'the special techniques' used. On the other hand, on the Nimrod MR2 all crews were trained for this mission without difficulty, which enhanced operational efficiency. One wonders if the US approach reflected their recognition of the lower experience levels of their crews. Towards the end of my tour my lead sensor operator and I were excluded from a training sortie against an *Ohio* class SSBN as a result of Admiral Rickover's new policy (see next paragraph), but earlier on we had completed a sortie, the briefing for which had been on the lines of 'there is a high hull number SSN (ie *Los Angeles* class) taking part, but, don't worry, they are so silent and good you won't detect it' – but my RAF lead operator did! This caused a few red faces, not because a Brit had seen it, but because everybody thought it couldn't be done!

The big negative point following my exchange tour was the cancellation of all the posts on front-line MPA squadrons in 1978. I should add that this change in policy was universal – it applied equally to Canadian, Dutch, Norwegian, Australian and New Zealand personnel. Furthermore, it was not attributable to those who had participated in the Exchange Programme; it was actually a consequence of the entry into service of the latest US submarines of the *Los Angeles*

and *Ohio* classes. But why? Admiral Rickover, the father of the US nuclear navy and still, at the age of 78, a serving admiral, had decided that there was a risk that we could learn the sound signature of his 'new babies' which, he thought, would jeopardise the force. What he did not seem to take into account was that the US was actually providing details of these acoustic signatures to the analysis centres of allied countries and that their sensor operators were being taught those signatures in order to avoid the new US submarines being misidentified as 'enemy'!

Despite that hiccup, the exchange posts at CINCLANTFLT, NADC (for a short time) and VX-1 continued and, after a short break, a single navigator exchange post started on the P-3 conversion unit, VP-30, where the incumbents, as well as being air and ground instructors, ended up on a training team established to teach NATO procedures to squadrons deploying to Iceland and the Med – at least one lesson, that we had taught them, which seemed to have been absorbed.

There is another potentially negative consideration. When first told of my exchange posting, the Navigation Leader on No 120 Sqn suggested that it might 'slow down my promotion', because I only had three Annual Confidential Reports (ACR). The pilot on exchange with me was advised by his Flight Commander, 'If you feel life is for living, go for it. If you are 'in' for a career, forget about it.' Both comments reflect poorly on the views held by some senior RAF officers at the time. The pilot went over with four ACRs and was promoted about 18 months into the tour and his subsequent career was not affected. I was promoted after one further UK-based ACR; a delay of about two and a half years, meaning that my career was definitely adversely impacted. Even knowing that, however, I would not have changed anything. The flight sergeant on my crew received two Commendations, from the admirals in Keflavik and at PATWINGSLANT, which must have helped when he applied for, and was granted, a commission.

I have been in touch with the current RAF cadre, but they have been reluctant to comment and have not contributed to this article.

Which brings me to the here and now. The P-8A Poseidon, which I have now been aboard three times with the VP-45 Squadron Association, in 2010, 2016 and 2018. It is a good aircraft and I only wish I was 30 or 40 years younger so I could crew it!

The accompanying photograph of No 120 Sqn appeared on the RAF Facebook site on 15 January 2019 as the first crews were about to start

The first 38-strong contingent of No 120 Sqn personnel began conversion to the P-8A at NAS Jacksonville FL in January 2019.

their conversion at Jax along with their UK instructors embedded in VP-30 as part of the Seedcorn programme. Seedcorn involves nine personnel on VX-1 and twelve on VP-30, made up of officers and SNCOs of all four trades – pilots, WSOs and WSOps (wet and dry). It is a project that remains vital to the maintenance of our ASW skills while we await our new aircraft. By the time this paper appears in print No 120 Sqn should have returned from Jax, or be about to do so, with the first four aircraft.

It is not too far-fetched to say that Seedcorn could only have been created at its size if the USN had not been impressed by those who had been on exchange over the previous 50 years. Moreover, many of the Seedcorn personnel had first-hand experience of the Boeing systems installed in the Nimrod MRA4, which were remarkably similar to those that equip the P-8 and, of course, we had the jet-engine operating experience from the Nimrod. Thus, there was much that the USN could leverage from the RAF too – it was a win, win arrangement.

AVM Andrew Roberts, working mainly through his local MP (and Chairman of the House of Commons Defence Committee), played a large part in re-establishing the maritime role and the initial establishment of Seedcorn. He suggested to me that it might not be an exaggeration to claim that, in some respects, it had been the RAF that brought the USN's P-8s into service. A suggestion backed up in a letter to AVM Roberts from the then CAS, Air Chf Mshl Sir Andrew Pulford, after a visit to Pax River in December 2015 – 'What was made clear to me by their US Navy command chain was the very high quality of our

personnel's input and contribution to the US Navy programme.' To reinforce that further, Vice-Admiral Massenburg, a colleague from my days on VP-45, whose last appointment was as the head of US Naval Aviation, told me in October 2018 that the RAF's involvement had made a 3-year saving in the Trials and Evaluation programme and thus the development of the P-8 project. Moreover, at the same time, the rear admiral commanding the Maritime Patrol and Reconnaissance Force paid fulsome tribute to the work done by RAF exchange personnel.

Another pointer to the regard in which the RAF is held, is that the USN was brave enough to let an all-RAF crew fly a P-8 (with no US minder) in its 2014 ASW competition – it won!

Notes:

[1] Twenty, ranging in rank from MAEOps and flight lieutenants (and their USN equivalents) to 3-stars, who were either in the exchange posts or who interacted directly with them.

[2] No 18 (Maritime) Gp, No 11/18 Gp, No 3 Gp and now No 2 Gp.

[3] In one incumbent's second year on the squadron he was issued with a new ID badge that was black and yellow and had FORNAT printed very conspicuously on the top. This was mentioned to the Air Attaché who said that it was not allowed. He made a few calls and later that day the incumbent was called in to see the Squadron Commander who returned the old badge and apologised. Apparently, he had been called by the DCNO himself who explained that the post had been established in 1948 and that the MOU had not been changed, despite several reviews, and it was seen to be historically significant for the USN. Moreover, the MOU specifically said that there would be no separation of USN and UK staff and the latter were to be treated as US nationals to the maximum degree.

[4] In brief, Link 11 (*aka* TDL – Tactical Data Link) distributes digital information between airborne, land-based, and shipboard tactical data systems. It is the primary means of exchanging data, eg beyond line of sight radar tracking information. **Ed**

[5] The, then, RAF Personnel Management Centre, Barnwod. **Ed**

[6] It is now known as the Fleet Replacement Squadron (FRS), the West Coast RAG having closed as part of the MPA force contraction from 24 to 12 front line squadrons and from 6 to 2 reserve squadrons.

[7] We pre-flighted five and walked towards two more before the 2nd Flight Engineer who had been sent ahead turned us round and the ground maintenance team turned us back from the other two.

SUPER JOLLY GREEN GIANT TRAINING SCHOOL

by Wg Cdr Bob Turner

Bob Turner joined the RAF in 1960. After Valiant tours with Nos 18 and 49 Sqns, he switched to helicopters in 1965 to fly Whirlwinds with Nos 103 and 225 Sqns in Borneo and as a QHI at Tern Hill. Following tours on the Wessex with Nos 18, 72 and 28 Sqns, the latter at Kai Tak, he had a USAF exchange in 1977-80 on the HH-53. Staff College and time as a PSO preceded a final tour as OC 230 Sqn on the Puma. After leaving the Service in 1986, he was Owner/Managing Director of West Country Property Services Ltd until 2009.

INTRODUCTION

During the Vietnam war the USAF created a combat rescue force, the prime purpose of which was to retrieve downed airmen, who often needed recovery from heavily defended enemy areas. The force consisted of helicopters, air refuelling/mission control aircraft, and were frequently accompanied by light attack aircraft in defence of the rescue force.

This paper will: describe the role in more detail, including the capabilities of the helicopters used; outline the deployment of the force worldwide; briefly describe the facilities provided for training the crews and note any significant lessons learned from the exchange tour. Finally, a few comments are included on the exchange officer and his family's experiences living as pseudo US citizens for three years!

ROLE & FORCE DEPLOYMENT

The Combat Search and Rescue Role (CSAR) had evolved within the USAF since its formation in the 1940s as the Air Rescue Service (ARS). In 1966 it was renamed the Aerospace Rescue and Recovery Service (ARRS), to reflect inclusion of the additional task of astronaut recovery for NASA. The ARRS motto, 'That Others May Live', was convincingly proven by the rescue of 996

The ARRS badge

airmen during the Korean War and 2,780 aircrew 'saves' during the Vietnam conflict. From the 1970s, as well as in Vietnam and Thailand, the force was deployed worldwide in numerous squadrons with elements on both US coasts, in Alaska, Hawaii, the Philippines, South Korea, Japan, and Europe – with a UK-based unit at RAF Woodbridge.

All training for the ARRS was carried out at the 1550th Aircrew Training and Test Wing at Kirtland Air Force Base (AFB), situated at Albuquerque, New Mexico. The base was very large by RAF standards. Other USAF units based at Kirtland included: the Air Force Weapons Laboratory (AFWL) which, at that time, was investigating laser air-to-air weapons; the Air Force Test and Evaluation Center (AFTEC) – the equivalent of the RAF's CTTO but with its own aircraft; the Naval Weapons Evaluation Facility; the Defence Nuclear Agency; the USAF Security Police HQ; and an Air National Guard A-7 Corsair Squadron. Also located at Kirtland was the US Government's Sandia Laboratories – a large engineering and nuclear science research organisation employing over 10,000 personnel, with its origins in WW II and the Manhattan Project at nearby Los Alamos. The base also shared the airfield with Albuquerque airport.

Kirtland was an ideal location for the training task with an excellent weather factor and vast uninhabited areas of desert and mountains in all directions. The airfield is 5,400 ft above sea level with mountain peaks up to 10,000 ft within 5 nm. The RAF exchange officer's role was as an Instructor Pilot (IP) on the HH-53 and for the latter 18 months of the tour I was appointed as the HH-53 Flight Commander.

In its early days the ARS used H-19 Whirlwind and H-43 Huskie helicopters, but the Sikorsky HH-3E Sea King was introduced in 1966. Later the HH-53B/C was specially developed for the CSAR role, being faster, bigger, better armoured and armed, and with a longer range.

THE SIKORSKY HH-53B/C

Compared with rotary wing types in RAF use in the 1970s, the HH-53 was a large helicopter. It had been in competition with the Chinook for purchase by the UK to provide a heavy lift capability. The maximum gross weight of 42,000lb (war rated to 50,000) was well over twice that of the Puma and the cabin capacity was similar to the Chinook. If required, 37 troop seats could be fitted. The aircraft could

An HH-53B 'Super Jolly'.

lift up to 13,000lb with 2 hours' fuel on board and with a lesser load and full fuel the aircraft could fly for 5 hours. However, the range was virtually unlimited as it was equipped for air refuelling (AR). This capability was provided by HC-130P/N Hercules also operated by the ARRS units.

The aircraft's performance was impressive, especially taking into account the relatively high altitude of Kirtland AFB above sea level where ambient temperatures were often up to 35°C. The helicopter was regularly operated up to 12,000 ft with no shortage of power. It had defensive armour around most of the vulnerable areas of the airframe and engines and was armed with 7·62 mm Gatling-type rapid-fire 6-barrel mini-guns on the rear cargo ramp and at each side hatch of the forward cabin. The comprehensive avionics fit included VOR, ILS, DME, TACAN, ADF, transponder and a simple Doppler navigator. A chaff dispenser and an excellent Radar Warning Receiver (RWR) was fitted (this was classified NOFORN but teaching its operation was part of the syllabus so the exchange officer was told to ignore the rule!). I found the HH-53 to be an impressive aircraft, which was as manoeuvrable and agile as most medium-size helicopters I had previously flown.

TRAINING FACILITIES

The Wing provided conversion to type and role training for all aircrew categories on the HC-130, HH-3E, HH-53B/C and H variants

and the UH-1 (Huey) which had replaced the Huskie at some AFBs for local and crash rescue use. A total of 36 helicopters and four HC-130s equipped the wing. In general, facilities were extensive by RAF standards, although there were some shortages of maintenance personnel at times during the tour. The 1550th ATTW had six squadrons – the HQ, two flying squadrons, the ground/simulator training squadron, and two maintenance squadrons.

After qualifying as an Aircraft Commander (AC) and Instructor Pilot (IP), I joined the 1551st Flying Training Squadron (FTS) as a pilot instructor – both in the air and in the simulator – for pilots converting to type and for their role training. The 1551st FTS had about eight 'full-time' IPs, including an RAAF flight lieutenant also on exchange. About eighteen other officers with primary appointments elsewhere in the wing (ground school instructors, standards examiners, wing staff roles, etc) also instructed – mostly only in the air – on a 'part-time' basis. Many of these 'attached' IPs included majors, lieutenant colonels and even a full colonel. I thought it might be rather awkward when I was appointed the HH-53 Flight Commander, but no problems occurred, and it became clear that in the USAF it was the appointment that counted and not the rank.

We also trained Flight Mechanics (FMs) – the equivalent of RAF helicopter crewmen – and their training ran concurrently with that of the pilots. Combat rescue crews also included Pararescuemen (PJs) who were trained as parachutists, divers, gunners and medical attendants. Part of their training was also carried out at the 1550th ATTW.

It was noted that the HH-53 Flight's task was very similar in student numbers and flying hours to that of the Puma OCU at RAF Odiham, but it had approximately five times the personnel resources and twice the number of aircraft provided at No 240 OCU.

TRAINING PATTERN

Each student course consisted of four pilots who were split into two pairs and several FMs. Each pair of pilots remained together throughout and with the same instructor for at least the first half of the course, both in the simulator and in the air.

Starting with 15 days of ground academic instruction, the course lasted 16 weeks with 48 hours flying and 60 hours simulator training. Ground training used the 'Systems Approach to Training' concept with

For refuelling and incident control, the ARRS had its own HC-130P/Ns.

extensive use of the slide/tape presentation method of learning and little traditional classroom instruction. This worked quite well but, for the more complex technical subjects, classroom methods were required. A cockpit procedures trainer was used in the early stages of the course, but flight simulator instruction was a major element of the first few weeks of the course and was integrated with the groundschool instruction.

The simulator sessions were mainly directed at checklists, emergencies and instrument flying training. The simulators provided six-axis motion but no visual system. However, they were very effective, and most students completed over 30 hours in the simulator, including their instrument check, before their first HH-53 flight.

Once I had finished my conversion to type, I completed a further 26 flying hours and 4 hours simulator time to qualify as an IP.

The simulators were also extensively used by crews from all of the deployed operational units worldwide. Each pilot and FM was required to visit Kirtland annually for a week of academic classroom training and simulator flying including renewal of a pilot's instrument flying qualification.

AIR REFUELLING

One of the most interesting and challenging phases of the course was air refuelling, even for an experienced pilot. The refuelling probe was

An HH-53B prodding with its 18-foot telescopic lance.

extended by compressed air to a point 18 feet in front of the nose and about 2-3 feet below the rotor tips. It normally required several dual sorties before a safe standard was achieved and this was carried out by day and at night. The danger of the refuelling hose and/or drogue contacting the rotor blades concentrated the mind of the student, who at first became extremely tense on the controls. This resulted in white knuckles, much over-controlling, floods of sweat and frustration. At first, only about one-in-ten attempts made contact with the drogue, so an early lesson was how to miss safely! Of course, the instructor paid very close attention to these efforts and in the early stages frequently had to take control. Eventually, with practice, most pilots learned to relax more and this made a good contact more likely. The satisfaction of 'plugging in' at the first attempt and taking on 8,000lb of fuel, especially in poor conditions, or at night, and when the mission depended upon the refuel, was very rewarding.

In such a vast country as the USA this capability was of great value. In December 1978, a search for an aircraft lost in the Rockies was ordered at short notice and the 1550th sent six HH-3s/HH-53s to the search area which was mostly above 8,000 ft. All the aircraft were to remain on station from 0800 hrs until dusk without landing. I flew one of the HH-53s for 11 hours from take-off to touchdown on that day –

with two air refuellings. Possibly a record for an RAF helicopter pilot! Unfortunately, the search only found four previously undiscovered crash wrecks.

The AR capability enabled the force to deploy at short notice over long distances very rapidly. This was a vastly quicker and simpler way to reach an operational area than the RAF method of dismantling helicopters for transport by fixed-wing aircraft and then re-assembling them in theatre. Long deployment flights had become routine by the mid-1970s, and this was demonstrated by air-refuelled HH-53 flights across the Atlantic to/from the 67th ARRS at RAF Woodbridge.

COMBAT SAR ROLE TRAINING

The concept of operations for the ARRS in the late-1970s was still largely based upon the experiences of the Vietnam War. This usually involved a force of several large helicopters (primary and back-up), an HC-130 as the Mission Controller and AR tanker, a forward air controller (FAC) in an OV-10 (Bronco), and light strike aircraft to provide suppressive ground attack in the event of enemy activity. In SE Asia the latter was usually several heavily armed A-1 Skyraiders.

PAVE LOW III[1]

However, it was appreciated that this largely overt method of operating might not be suitable for other areas of the world, and in particular in the European theatre, or in any area where the rescue mission needed to be covert. This had resulted in the development of the HH-53H Pave Low III-equipped version of the aircraft. The new equipment and role were under test and evaluation at the 1550th ATTW in the late-1970s, and I flew as co-pilot on several test flights.

The aircraft was fitted with a central avionics computer which received inputs from an inertial navigation system (INS), a doppler navigator, a forward-looking terrain following radar (TFR), a forward-looking infra-red sensor (FLIR), and a projected map display. In addition, more powerful engines were fitted.

By 1980, the Pave Low III system was well under development and was soon deployed to CSAR units. Later the system was incorporated in the UH-60 Pave Hawk which replaced some of the HH-53s. Most of the CSAR forces are now part of the US Special Operations

[1] PAVE – Precision Avionics Vectoring Equipment.

An HH-53H, with its normally snub-nosed profile disturbed by the lumps and bumps associated with the Pave Low III installation, sits on the pan at Kirtland.

organisation but retain the combat rescue role. More recently the tilt-rotor V-22 Osprey was added to the force and in 2020 a new version of the Blackhawk, the HH-60W, which is designed specifically for CSAR, is due to enter service.

FLIGHT COMMANDER DUTIES

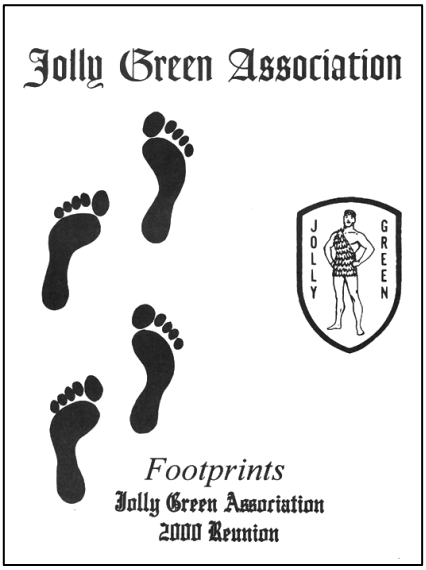
As mentioned above, after 11 months of the tour, I was appointed as the HH-53 Flight Commander. I considered this a little unusual, but also a significant privilege and I remained in the post for the rest of my tour.

The administrative aspects involved in running the HH-53 Flight were not arduous. Much of the student instruction scheduling was carried out by HQ Squadron staff although the Flight Commander was regularly involved. As well as regular flying and simulator instruction with students, and latterly as a flight examiner, responsibilities included the co-ordination and scheduling of duties for the approximately twenty-four assigned and attached pilots, the supervision of the sixteen members of HH-53 FM Section and the completion of annual reports for Flight personnel.

In my second year, I was a member of the team for the Annual Course Syllabus Evaluation and, during the last nine months of the tour, I was asked to update the IP Training Syllabus. In 1980 I compiled a

paper on RAF covert night SH operations as a contribution to the wing's review of night combat rescue operations. Liaison between Odiham and Woodbridge was arranged in connection with the review.

During the tour, I also made on-duty visits to Wright Patterson, Scott and Maxwell AFBs, to the Air Force Academy at Colorado Springs, and took part in Field Evaluation Visits to the Rescue Squadrons at McClellan and Eglin AFBs.



The passing of the Jolly Green Giant was frequently marked by his footprints appearing on other people's property.

JOLLY GREENS

In 1964 many CSAR helicopters were painted green in preparation for their deployment to SE Asia, and rescue missions acquired the R/T callsign prefix 'Jolly Green' plus a mission number. Many rescue missions made dramatic news and in the US these, and their astronaut recovery operations, attracted much public attention. As a result, the US manufacturers of canned corn with their mascot – the Jolly Green Giant – offered support to the rescue organisation and their logo became the force symbol. The HH-3E Sea King became the Jolly Green Giant and the HH-53 the Super Jolly. The 'giant' footprints now have a long-established record of appearing in many unusual places – including, not infrequently, on other units' aircraft!

The Jolly Green Association is very well supported by former and current members of the rescue service. I still receive an invitation to the three-day Jolly Green Association Annual Reunion in Florida every year and, in 1994, my wife and I were made very welcome at the 25th Reunion by the many friends made during the tour, despite 14 years having passed since it ended.

FAMILY ASPECTS

The domestic arrangements for the exchange officer and his family were very adequate. A spacious three-bedroom married quarter was provided in a pleasant quiet area of the base, near the Officers' Club (with its pool) and not far from the base commissary (supermarket). Medical facilities included a large USAF hospital at the base.

Our two sons had quite a few adventures travelling between New Mexico and their boarding school in Bath, and their younger sister, who attended a local private school in Albuquerque, soon learnt to salute the US Flag each morning during assembly!

New Mexico was a fascinating area in which to live and was fully explored during the tour. Leave periods allowed longer visits to the west coast, to Mexico, to Florida and into Colorado in the north. With road journeys of at least 250 miles to any other sizeable city, travel distances were a limiting factor, although the 55 mph speed limit was also an irritation! Overall, this was a highly memorable tour with a most rewarding job and life-style, as well as the acquisition of very many new friends.

LESSON AND COMMENTS – with the benefit of almost 40 years hindsight!

1. How fortunate the USAF and ARRS was to have such excellent equipment and other resources. Also, the quality of the people in the unit in which I served was most impressive.

2. It seems short-sighted that the RAF does not maintain a combat rescue capability. In WW II, and for the next 60 years, we had an air/sea rescue service for the recovery of aircrew and civilians, in the early days with amphibious aircraft and later helicopters, as well as a marine branch. Surely there is a requirement now to recover personnel from enemy held areas, whether aircrew, special forces or other civilians and officials. Although the RAF mounts casevac missions in conflict areas, there is no dedicated combat search and rescue force. Should it be needed, at present the UK would have to call for help from the USAF or French CSAR force!

3. An Air Refuelling capability for our SH force would be a valuable enhancement. Speed and ease of deployment to distant operational areas and a long-range rescue facility would be added to the service's

repertoire. The equipment required is already available and in service with military units in other countries.

4. A surprising lack of co-operation between the US military services was noted during the tour. This was clearly demonstrated by the disastrous Tehran rescue mission mounted by the USN and USMC in April 1980. This failed attempt to rescue the 52 US diplomats and citizens, who had been held hostage for over a year by the Iranians, occurred just before my tour ended.

At the time of the mission, the annual Jolly Green Association Reunion was in progress at Fort Walton Beach in Florida when news of the event broke. The two-star Commander of the ARRS was present at the gathering and had heard nothing of the mission before the news of the fiasco emerged. Had ARRS HH-53 helicopters and Hercules tankers been used there would have been no need for the desert landing and refuelling site where so much went wrong This would have meant a much greater chance of success.

Following the Tehran debacle, major command and control changes were made by President Reagan. through the 1986 Goldwater Nichols Act in Congress, which was primarily enacted to improve inter-service co-operation and joint operations. This meant that the ARRS force was transferred to the Special Operations Division of the new Central Command.

President Carter had been ‘in charge’ when the failed USN/USMC operation was mounted, but the inter-service rivalry which existed at that time reminds me of the unintended truth of an comment made by President George Bush:

> *‘Our enemies never stop thinking about new ways to harm our country and our people – and neither do we!’*

‘REMEMBER THE ALAMO!’ – USAF T-38A TALON PILOT INSTRUCTOR TRAINING, RANDOLPH AFB, 1990-92

by Sqn Ldr Stu Reid

Stu Reid joined the RAF via Birmingham UAS in 1975. After initial tours on the Jaguar and Tornado, by 1987 he was a QFI at Valley. Following his exchange tour on the T-38, 1990-92, he went back to the Tornado, for a third tour at Brüggen, before a posting to Waddington and a long (1996-2009) association with the Sentry. Before he left the Service in 2011, his final tour was on the Dominie at Cranwell but, since 1999, in addition to his primary duties, he had also been regularly flying the Lancaster and Dakota with the Battle of Britain Memorial Flight.

Introduction

My appointment under the terms of the UK/US Military Exchange Programme was as an Instructor Pilot (IP) flying the T-38A Talon at the USAF Pilot Instructor Training Center (PIT – pronounced ‘Pit’), at Randolph Air Force Base (AFB) in Texas. The assignment was comparable to that of an RAF Central Flying School Staff Qualified Flying Instructor (CFS QFI), in that it was the training of USAF T-38A Talon Instructor Pilots (IP) as a prelude to their role in training *ab initio* USAF undergraduate pilots for service as qualified pilots with the USAF.

My eligibility for the appointment at Randolph AFB was based on my qualification as a CFS A2 Advanced Flying Instructor at No 4 Flying Training School (FTS) at RAF Valley, flying the BAe Hawk T1, together with my personal aspiration to live and work in the USA on an exchange assignment. That said, I was well aware that selection for any such exchange appointment was highly competitive, being based on flying qualifications and experience and, crucially, to being in the right place at the right time. Fortunately, in my case, while serving as a Standards QFI at No 4 FTS in 1989, the stars fell into alignment on all accounts and I was fortunate enough to be selected for the two-and-a-half year Randolph AFB PIT exchange assignment, commencing in early 1990.

This narrative will cover, broadly, the location, the aircraft and the

assignment. The discussion will include the organisation of my host unit, the mission, the conduct of operations and, finally, my conclusions and observations. I should stress at the outset that the views expressed in this piece are mine alone and do not, necessarily, reflect those of any body, party or individual with which or whom I am or have been associated at any time. Also, since my retirement from the RAF in 2011, I have come to regret disposing of much of the documentation, course information and related material that I had accumulated during my 35 years of service as an RAF pilot in one form or another. Consequently, my narrative is an account of events of some 30 years ago as I recall them to the best of my knowledge and belief.

The Location – 'Deep in the Heart of Texas'

Randolph AFB is located on the outskirts of San Antonio, in south, central Texas and was one of several large military installations around what was the 10th largest of US cities at the time of our posting. The city has grown around the fabled Alamo, which lies at its heart and provides an historic backdrop to what has become a modern, cosmopolitan city of commerce and culture. It was an excellent location for a family to reside offering many attractions, including the San Antonio River Walk in the city centre, numerous shopping malls, a world-class zoo and such theme parks as Six Flags Over Texas and Sea World San Antonio on the city periphery. The beautiful white sandy beaches of Corpus Christi, on the Gulf of Mexico, were only a few hours' drive away and which, with the extremely warm, semi sub-tropical climate, were another enjoyable family attraction.

Randolph AFB, or 'Field' as it was initially, came into being during the 1920s when, having embarked on a major expansion programme, the US Army Air Corps (USAAC) identified a location to the northeast of San Antonio on which to construct a purpose-built airfield for pilot training. Whilst under construction, a committee was formed to select a suitable name for the new airfield, one member of which was USAAC Instructor Pilot Captain William Randolph. Tragically, following his appointment to the committee, Captain Randolph was killed in a flying accident on 17 February 1928. The remaining members of the naming committee decided, appropriately, that the new airfield would, therefore, be named in his honour.

Randolph Field has always been associated with pilot training,

Randolph AFB, 'the showplace of the Air Force.'

initially for the USAAC, and latterly as a centre of excellence in pilot training and education for the entire USAF. It was a beautiful facility on which to serve, with much of the base architecture combining a Spanish Colonial Revival style with the Art Deco movement that was prevalent at the time of its construction and has resulted in its achieving the exhalated status of 'Showplace of the Air Force'.

The base facilities were, as with most larger USAF installations, unsurpassed in comparison to those of RAF stations, in terms of both variety and quality, and the well-appointed Officers Club, located in the centre of the base, with its own swimming pool and pool-side bar, was particularly impressive. As well as the PIT Center, the base was home to Headquarters Air Training Command (now Air Education and Training Command) and the USAF Military Personnel Center.

The Aircraft – the 'timeless elegance' that is the T-38A Talon

The aircraft I flew as an Instructor Pilot at the Randolph PIT was the T-38A Talon. Its origins lay in the early 1950s when Northrop, like other military aircraft companies of the day, was designing and developing its own jet fighter. However, Northrop reversed the trend towards large, heavy and costly combat types, utilising large, heavy turbojet engines, using instead two extremely small, compact General Electric J-85s to create a much smaller, lighter-weight aircraft.

The Northrop T-38A Talon.

With the issue of a USAF General Operating Requirement for a supersonic trainer to replace its ageing Lockheed T-33 Shooting Stars, Northrop adapted their proposed combat aircraft design to meet the requirement and won the contract. The prototype YT-38 first flew on 10 April 1959, with the first production T-38s being delivered to the USAF in 1961. Over 1,100 of these nimble, elegant aircraft have been produced and are/were in service with a variety of nations, although the largest contingent, by far, is in service with the USAF. With on-going modifications and upgrades, the venerable T-38 Talon is likely to serve until 2029, some 70 years after its first flight.

In dimensional terms, the T-38A compares very favourably with the BAe Hawk T1, the aircraft with which I would draw immediate comparisons owing to my experience in the similar roles for which both types were procured by their respective nations. That said, they are quite different in terms of design philosophy and technical sophistication due, largely, to generational factors, resulting from the rapid evolution of jet aircraft technology in the intervening years between the respective design and development eras of the two types.

The stubby, angular wings and all-moving slab tailplane of the T-38A are in marked contrast to its elongated, curvaceous fuselage, which embraced the Area Rule concept in its design and resulted in the sleek lines that define the overall profile of the aircraft. With a moderate wing sweep angle of only 24·5 degrees at 25% Mean Aerodynamic Chord (MAC), the symmetrical-sectioned wing is of minimal thickness profile to achieve the high True Airspeed (TAS) required commensurate with the design objectives. Also worthy of note are the

The front cockpit of a T-38A in the 1990s; the original analogue instrumentation has since been replaced in the re-fitted T-38C by digital displays incorporating a HUD, GPS and INS.

inset ailerons to mitigate a possible degradation in roll-control authority whilst manoeuvring at high angles of attack. The T-38A wing was not equipped with any leading edge high-lift devices but was fitted with part-span trailing edge flaps which resulted in relatively high take-off and landing speeds. Unlike the Hawk T1, spinning was not permitted in the T-38A and there was no self-start capability on the ground which meant that an external air supply was always required to start the engines.

The conventional tandem cockpit configuration featured the main flight instrumentation positioned left and centre of the main instrument panel, whilst the avionics, environmental and systems controls and indications were all located within easy reach on the lower-left, lower-forward, centre-pedestal and lower-right consoles. One thing worthy of note was the large cluster of engine instrumentation on the right of centre on the main instrument panel to cater for the two turbojet engines, each equipped with afterburners necessitating the provision of twin nozzle position indicators.

Look-out from the front seat was excellent, although it seemed as though one was very much sitting ‘in’ the cockpit, akin to a bath-tub. By contrast, the Hawk, with its prominent nose-down slant to the

forward fuselage, cockpit side-rails and bulbous cockpit canopy, created the illusion of sitting 'on' the aircraft.

The rear seat instrument configuration of the T-38A was similar to that of the front, although the rear cockpit was not equipped with some of the systems, avionics and environmental controls. Look-out from the rear seat of the T-38 was very good, but the instrument panel and front ejection seat obscured more of the lower-centre field of view compared to that of the Hawk, in which the prominent vertical displacement between the front and rear seats, resulting in the forward slant to the cockpit, was designed specifically to provide an unprecedented field of view forward from the rear seat.

Badge of the 560th FTS.

The Assignment – The Organisation

In terms of organisation, I was assigned to the 560th Flying Training Squadron (FTS), which formed part of the Pilot Instructor Training Center (PIT) element of the 12th Flying Training Wing (FTW), under the authority of USAF Air Training Command (ATC). I was one of three foreign nationals on the IP staff of the 560th FTS, the others being pilots from the Canadian Armed Forces (Canadair CT-114 Tutor, CFB Moosejaw) and the French Air Force (Alpha Jet, Base Aérienne 120, Cazaux). The 560th FTS was of representative standard in terms of USAF command and control, with an Officer Commanding, Vice-Commander, Operations Officer, Executive Officer, Chief of Staff, Section Commanders, seven PIT Flights (A to G) plus some IPs individually assigned to Upgrade, Scheduling, Check Section and Flight Operations – to mention but a few. Each of the six flights was manned by up to eight Staff IPs in addition to the respective Flight Commander who usually held the rank of captain. Very much a 'pilot orientated' unit, all of the senior officers on the squadron were qualified to perform PIT IP duties alongside the main cadre of Staff IPs.

Moreover, in order to maintain flying proficiency and currency, numerous pilots filling staff appointments in HQ ATC also flew the T-38A with the 560th FTS. Of particular note among this group were the Flight Surgeons assigned to the Randolph Medical Clinic. There was always something reassuring about a visit to the Medical Clinic, for a consultation with a Flight Surgeon wearing a flight suit.

The T-38A PIT Course structure was arranged over a nominal 4-month period, consisting of academics, Dynamic Simulator training and practical training sorties in the aircraft. PIT Course participants usually numbered eight and were referred to as trainees, not students, owing to their post-graduate status as qualified USAF pilots. All USAF fixed-wing pilots, subject to *suitability*, were eligible to attend PIT training and were not, necessarily, from a fast-jet background; indeed trainee IPs were drawn from all the various fighter, bomber, transport, ELINT and tanker aircraft types, across the USAF – Strategic (SAC), Tactical (TAC) and Military Airlift (MAC) Commands. In addition, a relatively large contingent of IP trainees were First Assignment Instructor Pilots (FAIPs). FAIPs were *ab initio* pilots who, having graduated from their T-38A course and obtained their 'wings', were re-assigned to an Undergraduate Pilot Training Wing (UPT) as an IP. A similar system operates in the RAF for QFIs, so-called 'creamies', though the number is much smaller. A sizeable number of PIT IPs on the 560th FTS were former FAIPs who had been assigned to PIT at Randolph AFB on completion of their FAIP appointment.

The Assignment – The Mission

As mentioned in the introduction, the role to which I was assigned with the USAF was the training of *ab initio* Instructor Pilots for service at any of the five Undergraduate Pilot Training (UPT) Wings that existed at the time. They were located at Columbus AFB Mississippi, Laughlin AFB Texas, Reese AFB Texas, Vance AFB Oklahoma and Williams AFB Arizona. Randolph did not train IPs for the Euro-NATO Joint Jet Pilot Training (ENJJPT) Programme at Sheppard AFB in North Texas, which had its own in-house IP training program.

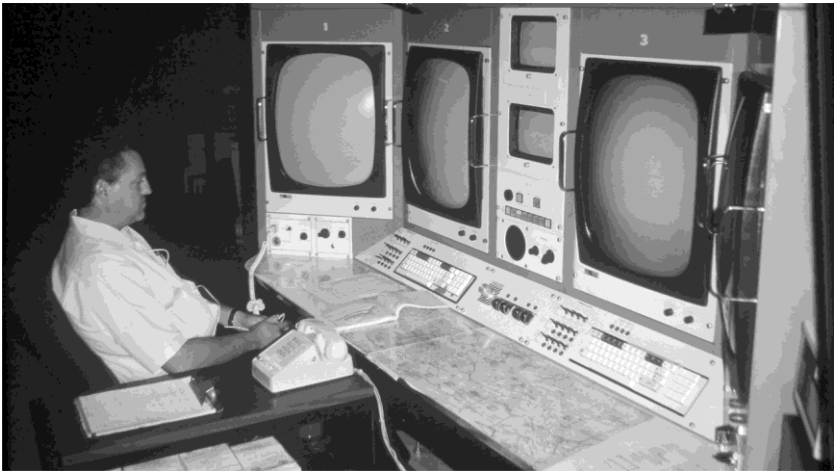
The role of the PIT IP is to introduce trainee IPs to the concept of training student pilots in all aspects of flying and operating the T-38A to the standard required to graduate successfully from their UPT course. In so doing, not only is it necessary to ensure that the trainee IPs

Some idea of the scale of the USAF flying training programme is conveyed by this picture of a flight line of T-38s that seems to go on for ever. This was at Vance AFB; there were four other schools like this. (US DoD)

maintain high standards of proficiency in all ground-based and flying disciplines, but that they are able, also, to train, impart knowledge and assess *ab initio* student pilots in relation to the same high standards in all aspects of service called for by the USAF. Consequently, in addition to instructing trainee IPs, PIT IPs assume the role of the student pilot in the front seat with the trainee IP in the rear seat during the PIT course. Although all IP trainees were already familiar with the T-38A, operating the aircraft from the unfamiliar rear-seat, combined with attempting to teach a student pilot the various elements of the syllabus for the first time with both accuracy and credibility, could be quite a daunting prospect for some. Another particularly interesting aspect of PIT IP duties was the provision of emergency procedures currency training for NASA astronauts in the Dynamic Simulator, which resulted in occasional visits to the NASA facilities at the Johnson Space Center in Houston, Texas.

The Assignment – Conduct of Operations

USAF advanced training on the T-38 was not the same as RAF advanced training on the Hawk. As stated previously, *all* USAF fixed-wing student pilots completed their training on the T-38A prior to graduation. This was not the case in the RAF where advanced training on the Hawk was specifically designed to prepare pilots to fly fast-jets, so students who failed to achieve the required graduation standard were re-streamed to gain their ‘wings’ on multi-engine or rotary types. Consequently, compared to the RAF’s Hawk course, T-38A student



Conversion to the T-38 and upgrading to IP made extensive use of the Dynamic Simulator – this is the controllers console.

training was more 'rounded' in order to prepare USAF student pilots for any aircraft type and role for which they might, ultimately, be destined. Indeed, while I was in the USA, T-38As were also utilised on some SAC units to enhance pilot proficiency and to enable relatively recent graduates to maintain operational readiness through the so-called Accelerated Co-pilot Enrichment (ACE) Program.

Following a brief session of T-38A technical academics (ground school), I completed my T-38A Upgrade (conversion) Training as a prelude to the full T-38A PIT Course. My upgrade training consisted of fifteen Dynamic Simulator sorties, covering normal check-list actions, bold-face procedures (immediate actions), other emergency check-list actions and instrument procedures.

Practical training in the aircraft consisted of ten contact (general handling) sorties – including a rear-seat conversion, five instrument sorties and six formation sorties.

On completion of T-38A Upgrade Training, I joined the full PIT Course as 'The Foreign Trainee'. The full academics phase of the course covered, among other things, T-38A Technical, Instructor Development, Grading Procedures and T-38A TOLD (Take-off and Landing Data). The academic phase included Dynamic Simulator sessions to cover systems normal operation and emergency procedures.

Further Dynamic Simulator exercises ran concurrently with phases or blocks of aircraft training to cover both proficiency and instructional training in contact (general handling), instrument, formation and navigation disciplines. On graduation, I took up my position as one of the line PIT IPs with A Flight on the 560th FTS, a post I held for 9 months before being appointed as the D Flight Commander, the appointment I held for the remainder of my exchange posting before returning to the RAF in Germany on the Tornado GR1.

Observations and Conclusions

With the benefit of many weeks to prepare for our relocation as a family from life in North Wales to South Texas, via in-processing at the British Embassy in Washington DC, our move was uneventful. The first thing that hit us on arrival was the heat and humidity, which was quite overpowering, even for January. There was no provision for an on-base married quarter so, following a short stay in a hotel, we moved into private rented accommodation in Universal City, one of the sub-divisions on the outskirts of San Antonio, a couple of miles from Randolph AFB. We were made to feel very welcome from the outset.

One of the first things I had to get my head around was the language. Flying in the USA, as one of many RAF participants in a major exercise for a couple of weeks, is a very different proposition to being one of very few 'foreigners' serving on a squadron in another nation's air force. Nevertheless, by rapidly adopting many Americanisms in terms of accent and phraseology, I soon became better understood and felt more at ease. Even Houston Center was impressed with my rapid assimilation of their being called 'Hewston Centah' as opposed to 'Hooston Center', which had prompted much amusement for the controller following one of my first radio calls and resulted in my first one-to-one tutorial with the friendly controller in cultivating my Texan drawl.

Another major factor was to gain an appreciation of the vast size of the country, which is actually a continent, and which brought many significant aspects to flying training and life in the USA as never encountered in the UK. Notwithstanding the close relationship that US citizens 'enjoy' with guns, the risk of death as a result of inadequate preparation for lengthy road trips through some of the more inhospitable parts of the USA was very real and was emphasised in

regular seasonal safety briefings. There were the different time zones, the climactic extremes, the topography and the weather which, in addition to having the potential to kill and to decimate anything on the surface, could easily result in the destruction of aircraft either in the air or on the ground. The provision of hail mats and shelters for parked aircraft was initially alarming, as was the standing requirement to implement aircraft evacuation procedures in case of an extreme weather event. In addition, flying over the USA revealed just how much of the country was a wilderness with vast swathes of open, unoccupied and beautiful yet, from a survival perspective, potentially very hostile landscape. Nevertheless, with adequate foresight and planning, it was not difficult to take account of the unfamiliar environmental extremes.

As I settled into my upgrade training, what became apparent very quickly was the very diverse way that our two 'Great Nations' set about doing the same job. In fact, with one or two exceptions, it was my simplistic belief that there were only a handful of ways in the world that military pilots were trained – the RAF and Commonwealth way, the American way and the former Soviet/Communist way. I concluded that such training protocols were a function of either geopolitical influence or, more recently, where the hardware, together with the training package that supported it, was sourced. Consequently, I found the conduct of pilot training in the USAF to be in stark contrast to that with which I was familiar and, while it highlighted the fact that the influence of the RAF and 'the British way' in the world is not infinite, it led to my greater appreciation of the quality of RAF pilot training as it was at the time.

I will admit that in the early weeks of my assignment, I found the ATC operating environment more challenging than I had anticipated, especially when set against the apparent informality of pre-flight briefings conducted in the form of a discussion across one of several desks in a large, busy office, with The Zombies' *Time of the Season* playing quietly in the background – it was all very 'different'. However, as with the language, my assimilation of the new environment enlightened me as to the benefits and diversity of USAF T-38A IP and pilot training. That said, I considered a USAF IP not to be the same as an RAF QFI, the latter having a greater understanding of the theoretical background to aircraft operation, technical systems and related academic subjects. On the other hand, the emphasis on grades and

Self with a Talon.

grading together, with the discussion surrounding the relevant taxonomies, was afforded greater prominence in USAF IP training.

The structure and delivery of practical IP training was quite different also. T-38A IP 'blocks' of training consisted of proficiency and instructional sorties under four main categories, which were contact, instrument, formation and navigation. RAF Hawk QFI training was built around teaching 'sequence' sorties to introduce student pilots progressively to the various aspects of aircraft operation and activity to enhance student understanding and development. As sorties progress, the emphasis shifts from QFI demonstrations to supervising student practice with increasing workload intensity. On the other hand, T-38A IP contact training sorties were more intense with less emphasis on the use of individual elements to cover separate syllabus items. IP contact sorties were invariably busy and covered many items in one sortie which were repeated in subsequent sorties to enhance IP proficiency.

The local airspace around San Antonio was administered by San Antonio International Airport Air Traffic Control, whilst upper airspace in the region came under the auspices of Houston Center. Military pilot training activity was accomplished in Military Operating Areas (MOAs) to the east and west of Randolph, but which necessitated transition through San Antonio and Houston Center airspace to gain access. All USAF pilot instrument training and qualification was in

compliance with FAA requirements of the procedural airspace environment within the Continental USA, there being no differentiation and separate qualifications for either Procedural or Non-procedural Instrument Ratings as were issued to UK military pilots.

Although formerly the Wing IRE at No 4 FTS and an experienced RAF 'Master Green' rated pilot, my instrument flying experience thus far had been confined, primarily, to the non-procedural operating environment of the UK and Germany. Consequently, PIT IP instrument and navigation training, with predominantly Jet Route (airways) flying and pilot-interpreted Terminal Procedures, was something with which I was less familiar, but from which I benefitted greatly later when I completed my training on the E-3D Sentry and the global role for which that aircraft was intended. In addition to training IPs to teach rudimentary instrument flying training, IPs were also trained to instruct student pilots in the completion of all pre-flight administration and compliance with all aspects of published en-route and airport procedures. I had never flown, let alone taught, a trainee IP, a 'localiser back-course' airfield approach or a 'TACAN to Circle' procedure as was required, routinely, on the T-38A IP course.

Training IPs to teach VFR and low-level navigation was carried out on Military Flight Training Routes, which enabled flight to be conducted at higher indicated airspeeds than the 250 KIAS limit that otherwise applied to all aircraft flying below 10,000 feet in the Continental USA. Most of the techniques for VFR navigation were similar to those of the RAF, but teaching in the context of the low-level environment, with which I was very familiar, was subtly different. My emphasis on the tactical relevance of flying at low-level was well-received, especially as the RAF was considered to be foremost in the employment of low-level tactics among those USAF pilots familiar with the RAF in Europe.

Considering the wide-ranging backgrounds from which PIT IP trainees were sourced, formation training was quite adventurous. Trainee IPs were trained to teach 'wing-work' in both fingertip and trail formation, practice breakaways followed by a re-join from 'the perch' and teaching the rudiments of route, extended trail and tactical formation was also covered. Since many trainee IPs were drawn from backgrounds where formation flying was not necessarily routine, I was always impressed by the competence of USAF PIT IPs in formation

flying.

And finally . . .

At the outset of my tour within the USA, I did question whether I had made the right choice, as I found many aspects of the flying environment to be very different from that with which I was familiar and, initially, I did not find it especially enjoyable. That said, within a few weeks, as I became acclimated to the differences and gained a greater understanding and appreciation of the USAF ATC regime, the assignment became, without doubt, one of the most enjoyable of my career. The USAF personnel could not have been more friendly or accommodating and the experience afforded an unprecedented insight into one of the most comprehensive and sophisticated military pilot training regimes in the world. Moreover, my appointment as a Flight Commander, on one of the foremost squadrons in USAF ATC, was a measure of their confidence in my ability to uphold the professional standards to which they always aspired, and I am especially grateful for the opportunity to have held such a prestigious position. I am aware, also, that much of the alternative perspective that I brought to USAF IP training was very welcome and I was especially touched by the critical acclaim I received from course participants about the positive impact of the 'British (RAF) way' on USAF IP training. The latter point was more significant during the final months of my exchange tour when, following Operation DESERT STORM, PIT received a greater influx of ex-TAC pilots who had participated in the operation and held the RAF in the highest esteem.

From a family perspective, we continue to share what will be life-long memories of our time in Texas and, such was the impact of the tour on my children, some weeks after returning to Europe and RAF Brüggen, my 9-year old daughter, having advised her little brother to 'Get his butt out of her closet', turned to me and, in her native Texan accent declared 'Dad, I hate this goddam place – I wanna go home!' I couldn't have put it better myself.

TANKING WITH THE 904th AREFS AT MATHER AFB

by Sqn Ldr Bob Tuxford

Bob Tuxford graduated from Cranwell in 1970. Apart from a brief interlude instructing on Jet Provosts, his career focused on air-to-air refuelling with the Victor K1s and K2s of Nos 214, 55 and 57 Sqns and a USAF exchange posting on the KC-135 Stratotanker. Having been awarded an AFC in 1982 'for gallantry for the part played during BLACK BUCK 1,' he attended the ETPS course in 1983 and subsequently undertook trials work on the Victor, VC10 and TriStar. He left the service in 1987 to fly with Monarch Airlines, retiring in 2010 with close to 19,000 hours and 70 types in his log book.

Good afternoon Ladies and Gentlemen. My exchange tour was as a tanker pilot, flying the Boeing Stratotanker at Mather AFB, Northern California in 1976 – the year of the Bicentennial. I was asked to stand in today for Air Cdre Jim Uprichard who, sadly, was unable to attend. I first met Jim on No 214 Sqn, and our careers moved in similar circles which included the common role of Air-to-Air Refuelling (AAR). It was no lack of coincidence that I should have followed him into the US Exchange Programme in the mid-'70s.

I assume that many of you who know Jim would be only too well aware of his passion for cars. His 'Doctor Who' car was a testament to his mechanical skills and was a popular sight at Marham. On arrival at the temporary living quarters in Mather AFB, I was in no doubt who owned the bright yellow Mustang Mach 1 in the car park – 'Updick'. It was an inevitable choice of wheels in sunny California: the archetypal muscle car and the last of the gas guzzlers. As impressive as this motor was, Jim admitted to me that it was a totally impractical car for his family, and even more so, for his parents who suffered in the rear bucket-seats all the way to Las Vegas and back. He suggested I not make the same mistake, as enticing as it was. The next day, as I was dazzled by the plethora of car dealerships in downtown Sacramento, I immediately was attracted to an electric-blue Pontiac Firebird – to Jim's huge amusement. Coming back down to earth, I eventually put on my

The Tuxfords and a KC-135 of the 904th AREFS at Mather AFB. (Bob Tuxford).

sensible hat and purchased a classic American station wagon. Not perhaps the sexiest vehicle, it was absolutely the ideal car that would serve us well over the next three years. Not only was it a spacious and comfortable Grand Tourer, but it also allowed us to carry cool boxes, camping gear, BBQ kit and so on. With the rear seats folded down, there was approximately 9 feet of room, more than adequate to allow us to rest overnight in sleeping bags at the popular KOAs (Kampgrounds Of America). Our son Richard who was just 3 years of age at the time christened it the 'CARBUS'.

After a very hectic one-week handover, we said our farewells to the Uprichard family, and I reported to the 904th AREFS (Air Refuelling Squadron). Outside the Ops Block stood a prominent billboard displaying the impressive shield of Strategic Air Command. A boldly emblazoned strap-line read:

'PRIDE COUNTRY' POPULATION 1,650 SAC PROFESSIONALS

and in much smaller typeface: + **1 BRIT**

After seeing the Uprichards off at Sacramento Airport, we drove to our quarter, on base housing, appropriately name 135 McCall Drive. The next day, I headed down the valley to Castle AFB: home of the KC-135 Combat Crew Training School (CCTS). A short ground school was followed by my first instructional sortie on the impressive Boeing Stratotanker. No time was wasted as I was introduced to my first boom refuelling of a B-52.

On my second flight shortly afterwards, I was placed No 2 in sequence in the impressive stream departure identified by the mnemonic 'MITO' – or Minimum Interval Take Off. The smoke belching out from the J-57 engines caused by the water-methanol

A B-52 approaching astern. (Bob Tuxford)

injection from the lead tanker ahead reduced the visibility to almost zero at the start of my take off roll – not so much Minimal Interval as Minimum Visibility!

The KC-135 flight deck was very different from that of the Victor. And much more akin to an airliner operation coming from the B-707 stable. Communication across the cockpit was made easy with the relatively low cockpit noise levels, and a lightweight headset could be worn. The centrepiece of the instrument cluster was the superb FD-109, a colourful and user-friendly flight director system unlike anything I had witnessed in the RAF. A number of airframe losses had occurred in its early years because of inaccurate rotation pitch information from the original attitude indicator. The 'fix', at enormous expense, was the revolutionary new FD-109 flight director and attitude indicating system. I was told that this upgrade had cost as much as the original airframe! Navigation on departure and arrival was achieved by the flying pilot using the self-interpreted nav aids, as opposed to the luxury of being directed by the two navigators as was the case in the Victor. The course included a full tanker conversion with refuellings undertaken against the B-52s of the Castle CCTS. After a dozen training sorties, I felt well prepared to take on the role in my new squadron.

Outside the air-conditioned and windowless squadron buildings, a bevy of KC-135s was parked in straight lines for as far as the eye could see. I remember thinking that, as a single squadron, Mather's fleet of refuelling aircraft numbered about the same as the total sum of Mk 1 Victors in the whole of No 1 Group. The dry air at the northern end of the Sacramento valley made the otherwise high ambient temperature of around 90°F all the more bearable. Facing the 904th AREFS tankers at the other side of the spacious ramp stood the menacing bombers of the 441st Bomb Squadron. The gigantic B-52s of our sister squadron were 'G' and 'H' models, characterised by the flat-topped fins. In 1976, the

The KC-135A's telescopic flying boom.
(Bob Tuxford)

BUFF (Big Ugly Flying F*****) had already been in service for two decades. More than four decades on, the Stratofortress retains an active role in the Middle East, and with continual updates, it is expected to perform for a further 20 years. Not that far behind, the Stratotanker had performed with distinction in the war in South East Asia and had proven to be a durable and flexible airframe. Apart from the tanking role, a large door made it a very useful freighter, even capable of loading spare engines when needed. Palletised seating platforms also enabled the carriage of a useful number of passengers, and we occasionally flew new station personnel on so-called 'orientation rides' around San Francisco Bay and the Sierras.

At the business end of the fuselage was mounted the rigid refuelling boom. Two elevons enabled the boom operator to 'fly' it laterally and vertically about its lowered nominal position. Laying out at full stretch in the boom pod at the rear of the cabin, this colourful bunch of aviators often bragged that they were the only people in the world who were 'paid to lay on their bellies and pass gas.' Looking down through a wide transparency, they could observe the receiver aircraft and direct them by R/T to take up the stabilised position just astern and below the boom nozzle. When ready, the inner sleeve of the boom could be telescoped outwards to make contact within the refuelling receptacle – usually

located on the spine of the receiver. Once in contact, the boom would follow the relative movements of the receiver as the close refuelling formation position was maintained. Should the safe area of operation described as the 'Cone of Safety' be exceeded, then a disconnect would be triggered, either manually by the boomer or automatically through limit circuitry.

Other SAC bombers that the squadron refuelled included the swing-wing B-1 Lancer. In 1976, the future of this aircraft was far from assured, and the prospective B-52 replacement faced funding uncertainty. It was very exciting to get the opportunity to witness the early refuelling trials of this revolutionary bomber. Rather surprisingly, the refuelling receptacle was located centrally on the nose of the aircraft, just forward of the cockpit transparencies. On occasions, I would be able to join the boom operator in his pod at the rear of the aircraft. I remember thinking as I watched with interest while the boomer skilfully extended the flying boom's telescopic sleeve into the receiver's receptacle, there was little room for error. On the first occasion I refuelled the Lancer, the fuel-thirsty supersonic-bomber took 75,000 lbs of fuel. Fuel transfer rates were noticeably greater than those in the RAF's tankers.

Situated barely one hour's flying time from the Refuelling Areas over the deserts around Southern California, Mather's tankers were in great demand to refuel the fighter aircraft operating from the test establishment at Edwards Air Force Base. Additionally, the US Air Force air combat training facility at Nellis AFB in Nevada provided the 904th's tankers with frequent and exciting refuelling tasks. One of my first operational sorties involved refuelling development batch aircraft from McDonnell Douglas, the F-15 air superiority fighter, and General Dynamics, the F-16 first generation fly-by-wire agile fighter.

The F-15 Eagle had entered service only months before I got my first sight of this aesthetically beautiful fighter. Resplendent in its sky-blue livery, the twin-engine configuration gave it a near thrust-to-weight ratio of 1:1. Positioning with graceful ease, the Eagle settled quickly just to starboard of our aircraft's centre-line, to make the boomer's job easier to line up the flying boom with the fighter's offset refuelling receptacle located on top of the port engine intake nacelle. Refuelling took place with the minimum of fuss, and the jet cleared to port after breaking contact to make way for his playmate. During this flight on

A pair of F-111 Aardvarks, from a flight of eight, waiting for fuel.
(Bob Tuxford)

16 November 1976, the F-15 arrived with one of the earliest development batch YF-16 aircraft, again striking in its General Dynamics test livery. The agility of this lightweight fighter was plain to see as it nimbly positioned below and slightly astern awaiting his fuel onload. Interestingly, the receptacle was situated on the spine of the fuselage, behind the bubble canopy and just in front of the vertical fin. After filling to full, no doubt the impressive new fighters went off to the ranges over Nevada to pit their wits against one another.

With the Red Flag ranges nearby, it wasn't too long before I met up with another new type, and one which the RAF nearly added to its inventory, the swing-wing General Dynamics F-111 interdictor. Bristling with underslung bombs, a flight of eight aircraft arrived for refuelling, looking very purposeful.

Their mission, post-refuelling, was to depart as a combined strike force to deliver an attack of some magnitude! Having refuelled the lead ship and two others, my No 4 engine oil pressure started to fall. I asked my receivers to ease out while I shut down the offending engine. After a brief inspection by the lead ship, I suggested to my crew that we would continue with the important task of getting the whole flight away as one unit. My young by-the-book navigator announced that he would call SAC HQ on the HF radio, as per the SAC Regulation 60-4. I stopped him in his tracks, and explained we had merely shut down one of our *four* engines, and with the fuel already consumed and dispensed, we

had bags of performance to spare, even if we were to lose another engine. I could see that this did not sit well with his instincts and formal training. It was probably not made easier by the fact that he was undertaking his first flight with me as an RAF pilot in command. Nevertheless, he cooperated without question as he sat on the edge of his comfort zone. By contrast, I could see a glint in the eye of my junior co-pilot next to me, who seemed eager to get on with the task in hand despite witnessing his first engine failure. The teenager in the boom pod at the rear was calmly just waiting for me to give him the go-ahead and call the next jet astern.

After topping up the remaining five aircraft without a hitch, I duly cleared the Aardvarks to depart and wished them good hunting. The tone in the formation leader's voice conveyed to me his appreciation for completing the refuelling mission, and we exchanged pleasantries as they raced off in burner. Needless to say, I then authorised the nav to make an 'advisory' call to SAC informing them that we had *just* lost an engine and were proceeding back to base. I believe my role as an RAF exchange officer enabled me to offer my USAF crew an insight into perhaps a more flexible way of operating than that which they had been taught.

Of all the fighter bombers that caught my imagination as a budding pilot was, without doubt, the Republic F-105 Thunderchief. When I was approached to stand-in at today's seminar by Gp Capt Jock Heron, he sent me a superb photograph of a 'Thud' refuelling from a KC-135 during one of his Pacific trails (see page 30). I have often been asked which of the two refuelling systems, probe and drogue or flying boom, was the better. Each has its advantages and disadvantages. As I reflect on the ruggedness and durability of the flying boom refuelling system however, I am reminded of a remarkable story that was related to me by our instructor boom operator whilst under training at Castle. The 'KCs' were used extensively throughout the war in South East Asia and in particular, in support of fighter/bomber sweeps. Chief Master Sergeant Sandy McLendon's crew had been part of an operation providing refuelling for F-105s striking at the heart of the enemy.

As their tanker was about to go off-task during one mission, they intercepted a MAYDAY call from a stricken jet returning from a strike. The Thud in question had been caught in the mêlée; it had suffered massive *FlaK* damage and had fuel leaking from just about every orifice

in the airframe. Furthermore, the damaged engine was losing power, and the pilot was having difficulty staying aloft. If Sandy's tanker had waited at the safe recovery towline until the stricken jet cleared the hot zone, it would have been more than likely that both aircraft and pilot might have been lost. In a selfless act of bravery, the 'KC' crew commander steered his aircraft on a beeline towards the damaged fighter/bomber that would not have been able to keep flying for more than a few minutes longer.

Against all odds, and avoiding narrowly being shot down themselves, the tanker rendezvoused in the nick of time with the Thud. Barely able to make contact because of its deteriorating engine, the F-105's pilot just managed to manoeuvre his sluggish jet to a position under the back end of the KC-135's refuelling boom. He had neither spare power from his ailing engine nor controllability from damaged controls to hold position longer than a few seconds. Seizing the moment, and without waiting for the properly stabilised conditions, Sandy skilfully flew his boom and captured the fighter's receptacle. Fuel started to flood into the receiver's tanks. Sandy could see the jet was leaking fuel from the obvious battle damage, and soon, the Thud was helplessly slipping back and approaching the extension limit of the boom's safety cone. An automatic disconnect seemed inevitable, with obvious disastrous consequences. Thinking on his feet, or should I say belly, Sandy yelled at the Thud pilot to hang in there and expect to be towed. Totally contrary to normal operating procedures, he instinctively isolated the safety limit switches. At full extension, the mechanical stop prevented any further boom extension, and the boom's latching device became geometrically locked within the receiver's receptacle. As the boom effectively became a rigid tow bar, the tanker was now dragging the hapless fighter through the air. The Thud pilot was just able to keep his aircraft under control behind the tanker as he was towed away from the war zone to more friendly skies.

Arriving over his safe haven in Thailand, the linked aircraft were flown to the airfield's overhead, where Sandy reactivated the safety circuits. Immediately, the refuelling boom retracted and flew up to clear the receiver aircraft. The Thud dropped back and down with the lack of thrust from the useless engine. The relieved fighter jock completed a classic 'dead stick' landing using the emergency profile adopted after an engine failure. A very appreciative F-105 pilot was overjoyed to set his

jet down, not only in one piece, but in friendly territory. He regarded it a small price to pay as he bought the beers for his tanker crew for the rest of the night. Sandy and his crew were justifiably rewarded with medals for gallantry, and my boom operator and I knew we had been in good hands whilst on our conversion course at Castle AFB.

My first Pacific crossing followed in September 1976. After positioning to March AFB for a briefing, which was an education in itself. Outnumbered by a host of colonels and half-colonels in charge of their respective tankers, as a flight lieutenant, I was commanding the last of six tankers briefed to stream over the Pacific coast where we would rendezvous with our twenty-four (yes 24) A-7 Corsairs. As the briefing officer called out the skippers' names, he hesitated when he saw my rank and name, and said '. . . and bringing up the rear – the limey from the British Air Force – God help us!'

Each cell of four aircraft joined up in trail with about half a mile between tankers and stacked up at 500 feet intervals. As I slid into place and looked over the whole Balbo from my tail-end Charlie position, I called 'In position'. I was humbled and impressed at the smooth and totally professional way in which my American counterparts had executed the busy departure from Southern California, and the complicated rendezvous with our chicks. However, the response to my call from the formation leader was as unexpected as it was amusing. In the words of that Country and Western singer, C W McCall, he responded in typical American casual way with the words: 'OK boys – looks like we got us a convoy.'

The variety of refuelling tasks included the 'heavy' types too. Interestingly, the C-130 workhorses of Military Airlift Command presented few of the problems that our Hercules freighters gave us in the South Atlantic in 1982. Whereas the somewhat questionable lateral and directional stability of the turbo-props made receiving fuel from the trailing hose of a Victor K2 tanker difficult, a seasoned boom operator could make up for those limitations during boom refuelling. No such problems existed in the E-3 Sentrys, whose airframe is built from the same basic blueprints as the Boeing 707. In a class of its own however was the C-5A Galaxy – otherwise known to our American counterparts as 'Big MAC'. As the C-5 manoeuvred astern towards the stabilised pre-contact position, a bow-wave had the marked effect of trying to push up the tanker's tail. In response, the aircraft's autopilot would trim

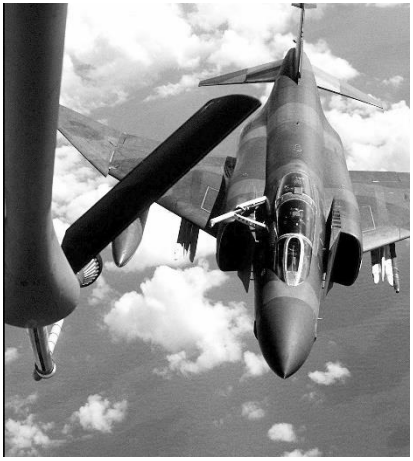
A C-5A Galaxy approaching from low astern accompanied by its invisible, but substntial, bow wave. (Bob Tuxford)

furiously nose-up, evidenced by the large pedestal-mounted trim wheels rotating noisily, as the aircraft tried to maintain its longitudinal trim.

We offloaded 70,000 lbs of fuel, after which he notified us that he would be back later to take the next two scheduled transfers! The reality was that he was planned to undertake a non-stop profile designed to keep him aloft for 56 hours. The operational reason and justification behind this task still mystifies me after 40 odd years!

In early 1978, I participated in another Pacific trail involving the F-4 Phantom. The background to this particular deployment revolved around the last batch of Phantoms sold to the Republic of Korea Air Force (ROKAF). The first leg from the west coast to Hawaii went without a hitch. The following day, our tankers launched in company with our three chicks bound for Andersen AFB, Guam. Unfortunately, one of the Phantoms developed a fuel system fault, which necessitated its return to Hickham AFB, accompanied by one of the KC-135s. This leg was significant as it involved crossing the International Date Line for the first time in my career. That same evening, I was introduced to the wonderful Kobe beef, a delicacy that has been one of my favourites ever since.

Running up against a tight schedule, it was important to ‘keep the show on the road’, so the next day I launched with the serviceable pair



A Lightning and a Phantom jousting with the KC-135's add-on hose and drogue. (Bob Tuxford)

of F-4s to continue to Kadena AFB, Okinawa. It had been envisaged that as the British exchange officer, I would not proceed further west than Guam. With the original plan now in tatters however, I quietly pressed on, seeking new horizons whilst deliberately keeping a low profile! Twenty-four hours later with the Phantom in Hawaii now serviceable once more, I departed Andersen on an easterly heading to rendezvous with the trailing jet over Wake Island. After joining up with him, I promptly turned west about and headed back towards Okinawa. Meeting up once more with my pair of chicks, the four of us then flew direct to our planned destination – Taegu Air Base in South Korea. The Royal Air Force 'wings' on my flying suit caused quite a stir amongst the diminutive ROKAF pilots, and I was thankful to avoid a potentially embarrassing diplomatic incident over the following days before our retreat to the United States.

I have saved the best for last – my encounter with the iconic F-100 Super Sabre. These classic Century-Series fighters were still very much in evidence in the late-'70s. Operated by the experienced pilots of the Air National Guard, the aircraft were fitted with probes. This required our tankers to fit the short hose and basket attachment to the flying boom to permit probe and drogue refuelling. I would remind this audience that while the majority of No 1 Group's tankers were deployed

on Ascension Island in 1982, the KC-135s of SAC filled in for the Victors and supplemented the diminished UK Air Defence cover. Far more rigid than the RAF's flexible basket, the American fit was not liked by the British fighters. I recall the Lightnings, in particular, suffered a number of broken probes whilst refuelling from the USAF tankers.

I was not alone in considering Mather to be one of the more desirable locations in the whole of the United States. The majority of my American counterparts also thought Mather one of the most geographically-desirable assignments on offer. Sacramento is the capital and government seat for the state of California. Its stunning Capitol building in the beautiful Capitol Park was modelled on the US Capitol building in Washington DC. It had the distinction of providing the Western Terminus for the iconic Pony Express. Situated at the confluence of the Sacramento and American Rivers, the squadron often took to rafts and enjoyed the superb climate whilst floating effortlessly down the American River. Cool boxes laden with chilled beer and snacks provided the necessary ballast to keep the rafts from capsizing and the troops' spirits high.

Geographically, my family was spoilt for choice for recreational activities at weekends. Although my Country Sedan offered easy touring around California's state highways, I was also fortunate in that I had a six-berth Recreational Vehicle at my disposal. Within a month of my arrival on the squadron, the Exec Officer had, in that very American way, generously offered me the keys to his motor home any time that he was not using it. He said that he used it during three or four weekends of the year, and the rest of the time, it sat idle on his driveway. He stressed that I would do him a huge favour if I would use it as much as I liked! The only stipulation was that I replenish the beer fridge contents and stocked cupboards! Needless to say, I put many more miles on that wagon during my stay than did its owner. This was not the only example during our exchange that my family witnessed the typically un-bridled American generosity.

Placer County to the north east of Sacramento was the home of the Gold Rush in the appropriately named El Dorado Hills. We toured the historic locations where gold was first discovered – exemplified by the rustic remains of Sutter's Mill at Coloma. Less than an hour away to the west was Napa Valley, and the lure of unlimited free wine tasting.

The slopes of both sides of the valley were littered with the most idyllic wineries. By 1976, the Napa Valley wineries were producing internationally-acclaimed wines.

Perhaps our favourite local venue was the captivating San Francisco. Barely 75 minutes away along Highway 80, we would enter the city via the Golden Gate, and gorge on fresh crab and lobster on the waterfront at Fisherman's Wharf. The many visitors who descended upon us in Northern California had, without exception, San Francisco at the top of their wish-list. We never tired of showing our guests the unlimited attractions: the iconic Trans-America Building downtown in the business district; the clanking cable cars; Alcatraz Island and the myriad of restaurants and bars.

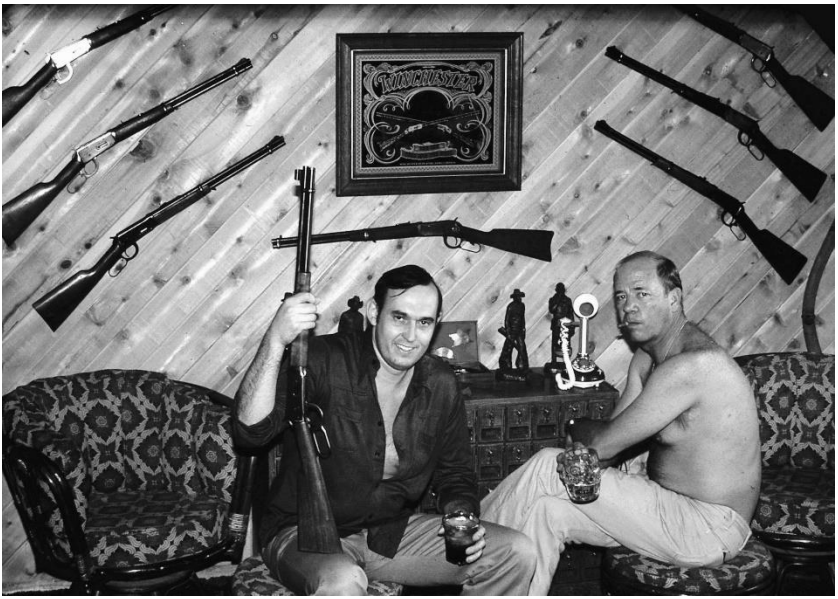
One of California's biggest draws were the giant redwoods and sequoias. We first came across the gigantic trees in Big Sur State Park. Crossing over the Coast Range to the east of the Sacramento Valley was the incomparable Yosemite National Park. In 1976, the falls in Yosemite were all but dried up – as California was in the grip of a seven-year drought. Further north, the state line of California and Nevada met at the scenic South Lake Tahoe. The casinos on the Nevada side of the state line offered wall-to-wall gambling, illegal in California of course. Amongst the many stars that we were privileged to witness in the hotels was the great Sammy Davies Jnr. His performance at a dinner show culminated in his fabulous rendition of Mr Bo Jangles. He brought the house down, needless to say. About seven hours drive from Sacramento were the bright lights of Las Vegas. In 1976, I was able to drive the motor home through the entrance of the Stardust Hotel and into the car park at the rear. Having connected the fresh water and electricity, we were able to enjoy the hotel facilities in our RV home for a long weekend – all for three bucks a night!

One of the highlights of the year from the exchange tour point of view was the annual migration of British officers to the Staff College at Maxwell Air Force Base in Alabama. Designed to coincide with international studies phase of the course, this gave a unique opportunity for the Brits to inject their Royal Air Force insight into the seminars. It provided a platform for the exchange officers to swap notes and compare each other's experiences and respective appointments. It also gave my wife, Eileen, the chance to chat with the other wives and families during what was a totally relaxed social setting. I planned the

visits in 1977 and ’78 around two not-inconsiderable ‘road trips’ as an opportunity to see as many of the United States as possible. The first southern route took us via Interstate I-10 through Arizona, New Mexico, Texas, Oklahoma, Mississippi and Alabama. Amongst other quick stops, we were able to take in The Petrified Forest just to the north of Phoenix, and The Alamo at San Antonio. The return route was accomplished by the most direct highway, I-40, in order to report back to the 904th in record time to appease my cohort in the Operations Office. After a brief excursion to Elvis’ childhood home in Tupelo Missouri, we motored along the historic Route 66 from Oklahoma City (which was ‘ah – so pretty’), through the towns made famous by Chuck Berry’s soundtrack – Amarillo, Flagstaff, Winona, San Bernadino, to name but a few. Having run the gauntlet of the miserable national speed limit of 65 mph by some margin, I drove relentlessly to catch a glimpse of Meteor Crater – only to be refused entry to the vast impact crater’s viewing area as we were 5 minutes beyond the last entry time. One viewpoint that did not evade us however was the spectacular South Rim of the Grand Canyon.

Returning the following year, we took the mid-west route outbound via Nevada and Colorado, where we had a brief excursion around the USAF Academy at Colorado Springs. Heading east across the great plains of Kansas, I approached Montgomery, Alabama from the north west and St Louis in particular. There we found time to ascend the dramatic Gateway Arch, before driving through Memphis, Tennessee and Birmingham, Alabama inbound to Maxwell AFB once more. After another spectacular week, our route home took us north west to Lincoln, Nebraska along I-80 towards the western frontier towns of Cheyenne and Laramie. The High Plains of Utah and Wyoming were truly awe inspiring, as the wild, open landscape could be enjoyed for as far as the eye could see. Scattered antelope littered the skyline, and my thoughts wandered back to the times when the great North American buffalo or bison would roam freely. We were able to take a personalised tour of the Mormon Tabernacle in Salt Lake City, before descending towards Reno, Nevada on the west side of the Rockies.

By October 1978, I was fast approaching the end of my exchange tour, having managed to secure a 6-month extension from the BDS (British Defence Staff) in Washington. On returning to the ramp during my last trip in the KC-135, I was duly doused by the Mather fire crews



The Winchester carbine given to me by Major Lance Bodine.. (Bob Tuxford)

– just as Jim Uprichard had been drenched three years earlier. Our final days were spent in the home of my Operations Officer counterpart with whom I had shared the office for the final year. Major Lance Bodine was the archetypal officer and was always immaculately turned out in his air force uniform. On returning to his ranch-style home in the El Dorado hills to the north east of Sacramento, he would waste no time in donning his blue jeans and checked shirt. Finished off with a pair of well-worn leather boots and a sweat-stained Stetson, the transformation into the Californian cowboy was nearly complete. For Lance was never seen without a beer in his hand, and a cigar drooping from his mouth! We had formed a genuine close relationship and had a mutual respect that we nurtured for many years after.

My interest in Lance's western lifestyle was underlined by one final act of generosity. The night before we were due to leave Sacramento airport for Washington DC, he reached up to one of the many short-barrelled rifles that adorned the wall of his study and thrust one into my hand as a departing gift. The Winchester Model 64 carbine was

identical to that made famous by John Wayne in several of his iconic movies. He had no idea of the grief and anxiety that firearm would cause me on my return to the UK!

As we boarded our American Airlines flight to Colorado, John Denver's 'Leaving on a Jet Plane' played over the public address. My wife and I sobbed uncontrollably at the realisation that we were leaving California and our many American friends. Some considerable time later as we were still recoiling from the shock of returning to a wet and wintery British climate, I came across a colleague who also had the good fortune of serving as an exchange officer in the USA. I asked him how long the desperately sad feeling lingered after returning to Blighty after such a wonderful and life-changing experience. He said in measured terms, that he regarded his life in one of two ways: BC and AC – Before California and After California.

SECOND DISCUSSION PERIOD

Wg Cdr Mike Dudgeon. First of all – thank you, all of you, for a fascinating series of talks. Picking up on this morning's question, about the extent to which people returning from the United States were listened to when they came home, can I turn that around? Although we actually have only one American speaker here, does the panel have any feeling for the influence that US exchange officers may have exerted when they got home – how much interest was shown in what they had been doing over here? Was the exchange programme of mutual benefit – or was the advantage largely ours?

Sqn Ldr Bob Tuxford. Perhaps I could expand on something that Col Wingfield said this morning, in the context of training. In contrast to his experience at Brize, when I went to Castle AFB (KC-135 OCU equivalent) I was put straight into the left-hand seat. I did my training sorties as a captain from the outset and I subsequently flew, not only as an aircraft commander, but after another year or so, as an IP.[1] By contrast, we got the first US exchange officer at Marham to fly Victors sometime later, by which time I had been through CFS and done a brief tour instructing before finding myself back at Marham. It has to be said that this chap found it very difficult. For me, converting to the '135 was rather like flying an airliner – it was a comfortable environment and the flight deck crew conversed naturally without the need for headsets. For him it was the other way around, of course, and he had a lot of trouble adapting to the RAF's rugged military hardware – ejection seats, LSJs, immersion suits, bone domes, talking on the intercom – and, although he had been a top-notch operator in the USAF, he struggled. It was a while before he graduated to the left-hand seat. So, there were some differences, and this may have affected the feedback.

Capt Don Fennessey. I was the second Navy exchange pilot on Harriers and there were a few more after me, one of whom was killed flying a solo recce exercise in Wales. It became apparent later, at reunions, that there weren't many Navy guys, but that could have been a function of the fact that, in contrast to the Marines, we lost interest in V/STOL and put all our eggs in longer-range, heavier, carrier-based aircraft. When I left No 3 Sqn, I went back to teaching on A-7s, so the

[1] IP – Instructor Pilot.

Navy, as an institution, may not have gained very much from the time I spent with the RAF. That said, people were very interested in my experiences over here, and in Germany – although I'm not sure that they believed all of it! But, from my personal point of view, they were three wonderful years – and my career didn't suffer too badly.

AVM Peter Dodworth. In the early-90s I was the Defence Attaché in Washington and at that time we had 162 exchange officers spread across all five services – including the Coast Guard. I had the task of visiting them all and talking both to them and to their commanding officers. The feedback was always very positive – the Americans were invariably pleased to have our people – and I'm sure that they believed that it was a genuine two-way exchange.

Perhaps I could offer a short vignette. On a visit to NORAD HQ at Cheyenne Mountain, where we had a wing commander on exchange, I was hosted by a brigadier general who showed me around. When we finished, I thanked him for the tour – and for the generous hospitality that he had extended to myself and my wife, who had accompanied me on this occasion. He explained that there was a reason for that. He had been on the U-2 programme when Gary Powers was shot down. Congress hadn't been aware of these overflights. They were very cross and ruled that no more American pilots were to fly over Russia so, for the next nine months the Brits did it.[2] At the time we had three RAF pilots flying the U-2 – and a doctor, because of the specialised high altitude environment. So my brigadier was, in his own way, acknowledging that contribution, underlining the point that the exchanges weren't a one-way street.

Tuxford. Just a thought – in the context of the British Defence Staff .

[2] Unsurprisingly, after 30+ years, the brigadier's recollection was not entirely accurate. At the time, the RAF actually had four pilots attached to the CIA programme, all of whom were with Det B at Incirlik, along with a navigator (mission planner) and a doctor. The RAF element made two overflights of Russia, Sqn Ldr Robert Robinson on 6 December 1959, and Flt Lt John McArthur on 5 February 1960 – both before Powers was shot down. These were the only flights over Russia by RAF-flown U-2s and, indeed the last operational U-2 missions by RAF pilots anywhere, although some earlier sorties had been flown over the Middle East. In all, between 1958 and 1974, fifteen British pilots were associated the U-2 programme. **Ed**, with thanks to Chris Pocock, author of the remarkable *50 Years of the U-2* (Schiffer, 2005) and other U-2 titles, who provided this information.

You will recall that, earlier on, I said that Mather was a delightful place to be stationed, even by American standards. Not surprisingly, therefore, they often took the opportunity to visit us in California, to such an extent that when one of their senior officers came over and stayed with us, in my married quarter, I got a $100 bonus on my entertainment allowance for having looked after him so well! (*Laughter*)

Air Mshl Sir Rob Wright. Then again, when *Ark Royal*'s air wing came ashore in 1977, Wg Cdr Graham Smart, who was the British Defence Staff officer concerned with my particular appointment, came to visit me for two days – and he stayed for eight! My point is, to echo what Pete Dodworth said, the relationship between Washington and the individual exchange officers was very good, as it was at Maxwell, in Alabama, which used to hold an annual event that was attended by all the exchange officers.

AVM Alan Johnson. I had the pleasure of spending two-and-a-half years at Strategic Air Command Headquarters at Omaha where I was Chief of Aerospace Medicine. In the course of taking over, my predecessor took me down to the School of Aerospace Medicine at San Antonio. While we were there, we took the opportunity to visit the Alamo, where we signed the Visitor's Book. There were two of those wonderful 'Daughters of the Republic of Texas' present and they were both deeply offended – 'How dare you desecrate this place in this fashion?!' The problem was that my predecessor was Wg Cdr Davey Crockatt! (*Laughter*)

Air Cdre Mike Gibson. Perhaps I could add to that. I think that our respective governments agencies had a sense of humour because, not long after we sent them Davey Crockatt, the Americans retaliated by sending us a US Coast Guard officer on exchange with the Royal Navy – Lt Cdr Winston Churchill. (*Laughter*)

Sqn Ldr Peter Crispin. I spent a long time in the maritime world, but I never got to South America. Bob Hall made a brief reference to Venezuela and, I think, Ecuador? – what was going on there?

Sqn Ldr Bob Hall. UNITAS has been running for many years; it takes

place off the coasts of all South American states.[3] Every year one of the USN P-3 squadron participates with one or two crews assigned to each country as the action moves around. As Brits, we were not allowed to go to Argentina or Chile – I'm talking of the late-1970s here. I went to Colombia, which was fine. We did some very simple, NATO-style PACEX[4] anti-submarine exercises and we were planned to do another from Venezuela. Unfortunately, prior to the evening debrief, while everybody was flying back to their bases, there was a very heavy thunderstorm and a Cessna 310 disappeared from the radar. My crew took part in the subsequent search but nothing was seen – not least because the heavy rain meant that the rivers were in full flood and washing tons of soil out to sea so the water inshore was brown and opaque. Having drawn a blank visually, I decide to try a magnetic anomaly search, which, for a target as small as a Cessna 310, was a bit of a long shot. But we actually found two things. Fist, my operator picked up a response which turned out to be an LST that the Navy had lost some 10 or 15 years before and never found. The second response was the Cessna, which still had the bodies of the crew, which provided some sort of closure for the families. It was assumed that the aircraft had probably encountered a severe downdraught during the storm and had hit the water. UNITAS was cancelled, of course, and the next day we flew home.

Wright. Thank you. We have Gp Capt Jim Beldon with us and, before I wind up, I would like to offer him the floor to say a few words about the exchange programme today.

Gp Capt Jim Beldon. Thank you Sir. I am currently the RAF's Director of Defence Studies. As such, while I am not directly involved with the exchange programme, I am part of the Air Staff and my colleague, Wg Cdr Helen Simpson, actually runs the programme. Helen was due to be with us today, but she is in an advanced stage of pregnancy and, you will understand, that that had to take priority.

[3] UNITAS (Latin for unity) is a multi-national maritime exercise that has been held annually since 1960. Focused on South American and Caribbean nations, it is heavily supported by the USA and sometimes involves participation by Canada and European nations, including the UK.

[4] PACEX – technically, Proving and Adjustment of Communications Exercise.

My comments will be generic, rather than specific. In essence, while it is smaller than it used to be, today's exchange programme is still regarded as being as valuable as it ever has been. And, just by looking at the example represented by today's speakers, I think that the quality of the people that we send to the USA is self-evident and this is underlined by the fact that many of those of who have participated have had very successful careers and held senior appointments in the aviation world. So the sort of factors that have cropped up repeatedly in today's presentations – trust – affinity – mutual respect – are still alive and well. And, from an RAF perspective, I think it is also evident that the quality of our training, especially of our aviators – their self-reliance – flexibility – independence – is held in high regard by our American colleagues and indeed, I would like to think, throughout the world.

So, to sum up, I believe that the exchange programme has done much to cement the ongoing close relationship and mutual respect between our air forces while, at the same time, validating the quality of our own organisation.

Wright. Time to start wrapping up. During the day, with the eventual printed record in mind, I have been jotting down key words and thoughts. I asked myself a couple of questions to begin with.

Why is the programme so successful? To which the answers must include: common attributes, then and still today; common language; mutual admiration; personal relationships; professionalism; shared history.

Is the special relationship as strong as it used to be? I think you will agree that, from a military standpoint at least, it is as strong as ever and it has been built upon, and reinforced by, the experiences reflected in today's presentations.

I jotted down – scale – responsibility – trust – security classification (the NOFORN issue and the pragmatic 'you are one of us' solution) – mutual respect. I didn't include Don Fennessy's personal list of objectives, although they seem to have worked very well for him. (*Laughter*) And then there's that very American 'can do' attitude. Perhaps I can squeeze in an anecdote about that before closing.

When I flew out to the *Saratoga* early in my tour to carry out my carrier qualification, I had never even seen an aircraft carrier, let alone landed on one, but I was forced to hold in the overhead for two hours

while a Vigilante pilot was being qualified, because you can't mix A-5s with F-4s. I eventually got very low on fuel – we were already below what the RAF would have required as minimums for landing – so I said to my RIO, 'We aren't going to make this; we are going to have to divert to Jacksonville right now.' He came back with, 'Not a problem. I've just spoken with the squadron and they are going to launch an A-6 who can top us up. So, we can still do the qualification.' That produced a large 'thinks bubble' in the front cockpit because – as I told him, I had never tanked! (*Laughter*) My back-seater, who then had an even bigger 'thinks bubble' came back with – and here's that 'can do' attitude – 'It's easy!' So I tanked (it was easy, especially off an A-6) and we went on to carry out the required ten landings and launches from the ship.

By contrast, when I came back to the UK, I was posted to Buccaneers. While doing the conversion course at Honington, we had to go up to Marham and stand behind a Victor with its hoses deployed and laid out on the ground so that we could see what a drogue looked like. Having previously tanked numerous times, I asked to be excused that particular expedition – but no – that wasn't allowed.

Going back to my jottings. Culinary factors? Nope, nothing really learned there. Language? Yes! I recall my next door neighbour, a very attractive Southern Belle, asking me to give her a lift to somewhere the following morning. I said, 'Yes – I'll give you a knock,' and she said, 'I'll look forward to that Rob; perhaps you'll give me the lift afterwards.' (*Laughter*) So the common language could be a problem at times . . .

Friendships? Terrific! For those of us who were fortunate enough to have this experience, it will have been an unforgettable time to develop long-lasting and close relationships – which were to prove extremely helpful in the future.

And so, to close the proceedings. Thank you, Jock Heron and Jeff Jefford, for your management behind the scenes. Thank you to the RAF Museum for hosting us. Thank you to all the speakers for their very interesting perspectives and thank you to the audience for your interest and participation – and for staying awake during what has been a long day. And, finally, thank you to the RAF Historical Society for mounting the Seminar. I hope we have gone some way to recording an important period in the history of the RAF/USA Exchange Programme between the 1960s and 1990s.

MEDICAL BRANCH EXCHANGES

by Air Cdre Mike Gibson

In addition to the exchange programme enjoyed by the Executive branches of the RAF, the RAF Medical Branch has benefitted from an exchange programme for many years. Initially it was a one-way process with officers going to the USAF but with no reciprocal programme. Later, it evolved into a true exchange. At its height, there were two exchange posts: one between the RAF Institute of Aviation Medicine (IAM) at Farnborough and the USAF School of Aerospace Medicine (SAM) in San Antonio, Texas; the other, between HQ Strike Command (STC) at High Wycombe and USAF Strategic Air Command (SAC) – either at SAC bases or at HQ SAC at Offutt Air Force Base (AFB). In addition, there was the post of SOAvMed in the Washington Embassy. As the exchange programme was so small, the officers engaged in research at Farnborough and San Antonio frequently knew each other well.

By the late 1980s, the programme had changed. The RAF was having difficulty in providing pilots for the RAF IAM research Hunter T7 (XL563) and later, when the IAM closed, for the Hawk for the RAF Centre for Aviation Medicine at Henlow. There followed a succession of what we would call Medical Officer Pilots (the USAF call them Pilot Physicians) instead of a research physiologist from the US, while the RAF continued to send specialist medical officers to SAM. In addition, the SAC post and the STC posts were given up and the SOAvMed post was disestablished. Instead, an exchange post was established at HQ Systems Command at Andrews AFB near Washington and the incumbent was allowed to travel to the Embassy two mornings a week to carry out some of the role of the disestablished post. In 1991, HQ Systems Command was moved to Ohio. Some inspired staff work by those involved (particularly by, the then Wg Cdr, Iain McCoubrey) had the post moved to the Surgeon General's Department at Bolling AFB, just over the river from the Pentagon. I was the first in that Department.

Initially, I was placed in the Department of Professional Affairs and Quality Assurance. I really did not know what that meant but I was working with a mixture of flight surgeons, physiologists and bio-environmental engineers. Soon after arriving, I met the Surgeon

General (SG), Lt Gen Rusty Sloan. He complained that he had been told to reduce the numbers of his HQ staff. I suggested Mrs Thatcher's approach of creating an agency and then claiming to have reduced numbers. The next morning, I discovered that we were now called the Air Force Medical Operations Agency (AFMOA); the SG later testified that he had reduced his HQ by 10%. I became used to working in a cubicle (à la Dilbert), starting with one shared with the photocopier and coffee machine and gradually, as I had been there longer, moving nearer the window.

My early work involved staffing 'waivers' for aircrew. The USAF operate the process of managing aircrew differently from the RAF. Whereas the default position for sick RAF aircrew is that they are fit to fly unless grounded, the Americans work the other way round. Any sick aircrew member is automatically grounded until they are 'waivered' back into the air. For simple conditions, this can be done on-base by the Chief Flight Surgeon. More complicated cases are referred to the relevant major command HQ. And even more complicated cases are sent up to SG's Department. Once a recommendation is made, often after detailed investigation by the specialists at SAM, the decision is sent up the line for ratification. Unfortunately, it was apparent that there was not always consistency in the process. For example, there were several pilots who had been permanently grounded after one migraine attack, on the ground, and with a known precipitant that could be avoided. Conversely, there were also some who had had an incapacitating migraine attack in the air who were still on flying duties.

I was given authority to start writing a waiver guide, disease by disease, giving: the aeromedical considerations for each condition; whether or not a waiver was required; the tests that had to be carried out before a waiver could be considered; acceptable treatments; and a discussion and the previous USAF experience with aircrew with this condition. This had all the makings of a dull book. I discovered, by scrutinising the regulations, that cartoons were permitted. The publishers of the Far Side cartoons by Gary Larsen kindly gave permission for the use of six of his cartoons free of charge. When the 200-page pamphlet was finished, I discovered that it had to be approved by no fewer than eighteen general officers (including the surgeons and commanders of each major command). I sent a copy to each and received the required signatures. I then discovered that instead of

The Top Knife flying suit patch.

sending the copies out in parallel, they were meant to proceed from one general to another so that they could all see what the others had thought. I ignored that. I was then told that there was a two-year wait for printing as the USAF Chief of Staff, General McPeak, had directed that all the regulations were to be brought up to date. As the Publishing Department was in the same building, I invited the head out to lunch – at that time we still had an entertainment allowance. He disclosed that the printing department was still waiting for the first batch of work and if I could give him the floppy disks, he would see what he could do. One week later I had 2,000 copies of AFPam 48-132 to distribute.

I then tried to persuade the US Army and US Navy that they should also adopt the guide. The Army declined but the Navy changed the style and adopted the substance. My successor at AFMOA, Gp Capt Duncan Mitchell, persuaded the staff at USAF SAM that the students on the 3-year residency in aerospace medicine should review one third of the pamphlet each year, and this still takes place. For one year the USAF and the USN had the same policy which, unfortunately, has since diverged.

There were three particular highlights of the tour. First, I was tasked to evaluate a course run by the Air National Guard at Klamath Falls in Oregon to train flight surgeons to be fighter surgeons. The course was called Top Knife and had three component parts. The squadron was a full-time squadron, but its flight surgeon was a weekend warrior, so the two students at a time had to provide medical cover for the flying operations. There was an academic component of computer-based learning run by the University of Oregon with a multiple choice examination. And there was the opportunity to fit in as much F-16 air combat training as you could. I logged 14 hours in the 8 days that flying

was possible – as I was an alien I could not take off or land, but I was allowed to do intercepts, formation aerobatics and control the aircraft while being refuelled by a KC-135 tanker. I had also been asked to evaluate the course to make dentists more air-minded as they were stuck in their surgeries. I reported that if the USAF could afford to let dentists do this, it would, of course, make them more air-minded. But the USAF baulked at my suggestion that for the dentists the course should be renamed 'Top Gum' – it still runs as 'Top Drill'.

Then Gp Capt, Mike Gibson with an F-16 of the ANG's 114th FS, 173rd FW at Kingsley Field, Oregon.

The second highlight was to go on a People to People delegation to China with several of my USAF colleagues. We gave talks in Beijing, Xian and Shanghai at military universities and toured their institute of Space Medico-Engineering as well as doing the tourist sights. The third highlight was two weeks spent in Mogadishu carrying out an investigation into the perceived poor treatment received by the US Marines after being mortared. In fact, they received excellent treatment, but by accident, as the nurse-led Aeromedical Staging Facility to which they had been taken just happened to have two board-certified accident and emergency physicians visiting.

One of the benefits was making contacts. For 10 years after I returned to the UK (25 years ago) I knew personally every Surgeon of every major command. The current USAF SG (Lt Gen Mark Ediger) was a student on the SAM residency course when I was on exchange and we met at several parties. One US Army Ranger medical officer I

met on several occasions was delighted to provide medical cover when I asked if he could cover a recce party we had sent from the PJHQ to Africa.

The two mornings a week in the Embassy were also useful – not only socially. It allowed the RAF Defence Attaché and the Air Attaché who were meant to have their aircrew medicals carried out in the clinic in the Pentagon – both over 50 years old and thus required to endure a flexible sigmoidoscopy – to have me carry out the medicals in the Embassy, using the aircraft-carrier sized desks as the examination couch. I think that probably contributed to my subsequent promotion.

When I left, the SG asked if I would by-pass the chain of command and place on his desk my views as to what was wrong with his department. It was short – I wrote that I had worked with the most highly-trained, intelligent and hard-working bunch of officers and they were not allowed any initiative. I think I used the phrase 'you trust them with diddleysquat'. From my position, as a group captain, I reported to a colonel, who reported to a colonel who reported to a one-star officer. If I wanted the SG to see anything, it had to cross sixteen desks before it reached him. Unfortunately, it proved impossible to change that culture.

Many of the officers involved in the medical exchange programme went on to high rank. For example, the pilot physicians Colonels Andy Anderson and Tom Travis went on to become SG. On the British side, at least four participants achieved the rank of AVM and John Baird became the British SG.[1] As the RAF reduces in size, there will be undoubted downward pressure on the exchange programme. In this, the benefits to the RAF of exchanges involving the non-executive branches should be protected.

[1] The post of Surgeon General – the SG – was latterly a tri-Service one, the three RAF officers who have filled it since 1990 being AM Sir Nigel Mills 1990-91, AM Sir John Baird 1997-2000 and AM Paul Evans 2012-15. A fourth, AVM Alastair Reid, was appointed as Acting SG in 2018 while the future of the post was under review. The outcome was that, in 2019, it was restyled as the Director General, Defence Medical Services, the first incumbent being a civilian executive, Peter Homa, recruited from the NHS, although this does not preclude the post being filled by military officers in the future. ***Ed***

FLYING THE McDONNELL DOUGLAS YAV-8B PROTOTYPE

by Gp Capt Bob Iveson

In 1979 McDonnell Douglas were developing the AV-8B (the big wing Harrier) as a replacement for the Marine Corp's AV-8As. The two main design criteria were, first, making the aircraft easier and safer to fly, as the Marines had struggled a bit with a high accident rate and, secondly, doubling either the range or the payload. Our MOD – OR 40 in the shape of Wg Cdr Terry Nash – was evaluating the project as a possible replacement for our own Harrier GR3s and was to lead a team to the USA to fly and asses the prototype YAV-8B. Usually, such flying of early prototypes would be the reserve of test pilots, but as well as the scientific advice of test pilots, Terry wanted the opinions of a 'bog standard' front line Harrier pilot. I think I was chosen as Terry knew my abilities, having been my Flight Commander for three years on No 3 Sqn in Germany, and also I had recently returned from an exchange tour flying AV-8As with the Marines in Cherry Point, so was familiar with flying in the USA.

The Boscombe Down team consisted of test pilot, Dave Scouller, and a flight test engineer. As they also wanted to extract the scientific data from my sorties, I was given a two-day 'test pilot course' consisting of a few lectures and two flights in a JP5 with Dave, learning the art of such things as wind-up turns. In November 1979, the four of us flew out to St Louis and went straight to McDonnell Douglas's factory on the side of the international airport.

This was an impressive place where they were producing the F-15 Eagle for the USAF and were in the latter stages of developing the F-18 Hornet for the US Navy alongside developing the AV-8B. We were shown all-round the prototype YAV-8B with its big wing, huge flaps, large strakes and dam under the fuselage. It also had huge engine intakes with two rows of auxiliary doors. The low cockpit and nose were still the same as the AV-8A, as the large raised cockpit and bubble canopy had yet to be added. The cockpit layout was a bit of a mishmash of AV-8A instruments and development/test equipment, but all the essential levers and switches were in the right place, so I was confident about flying it.

After a few more briefings the next day, we drove out to Whiteman

The McDonnell Douglas flight test hangar at St Louis with a YAV-8B prototype backed up by an early F-18, an F-15 and an F-4. (FFRC Photo Collection)

Air Force Base where we were due to conduct our evaluation sorties. Currently the home of the B-2, in 1979 Whiteman was a very quiet airfield with only the occasional transport aircraft to service the hundreds of Minuteman missile silos spread across Kansas. Our motel was just outside the base in the unusually named small village of Knob Noster. Every morning we would have an excellent breakfast in the village diner named The Office. Immediately above the counter was a large sign with an arrow pointing straight down. The sign read, 'You are now sat at Ground Zero'!

On base, at the flight line, we were shown the YAV-8B but were told we would not be flying this one, but the one we had seen back at the factory. Apparently, when they first flew the prototypes, they had discovered a severe drag problem with the airflow around the wing root and fuselage join area, leading to excessive drag as speed increased. They had found a cure and the aircraft back at the factory had been

The YAV-8B prototype, still with the original 'low' canopy.

modified accordingly and would be with us that afternoon. It didn't arrive and we were told they were having a bit of trouble setting up the engine accels (always a bit of a dark art on the Pegasus!). This lasted a couple of days, but finally we were told that it was airborne and en-route to us. Half an hour later we were told the pilot had ejected and the aircraft had crashed into open farmland! We later found out that the cause of the accident was a poorly set up engine accel leading to a locked-in engine surge.

Unusually, for a US programme, McDonnell Douglas had only planned on two prototypes, and now they were down to just one. After much discussion it was agreed that we could fly the remaining aircraft, but only to evaluate the VSTOL/STOVL aspects of flight. There was time for two flights that afternoon. Dave took the first one but, being a test pilot on a new aircraft, took nearly two hours to get airborne and then, following a 'navigational incident' flew a slightly longer sortie than planned. By the time the aircraft was turned round and ready for me it was almost twilight. I got airborne as quickly as I could and accelerated away. I soon saw what they meant about the excess drag. Above 300 kts acceleration became painfully slow and we couldn't make it much above 370 kts. Back in the circuit, however, the VSTOL performance was very impressive. The aircraft was much more stable in the transition to and from the hover and in the hover itself. The big

wing and huge barn door flaps were very effective such that the sudden drop off in wing lift that would happen at about 90 to 100 kts in a GR3, was more gradual and didn't really kick in until about 60 kts. The air dam behind the nose wheel, the natural dam formed by the main wheel door, and the large under fuselage strakes formed an air trap resulting in positive ground effect. The vertical landing was easy. From a very stable hover, a slight reduction of power started the descent and then, at about 10 ft, power was gradually reduced further to achieve a soft landing. By the time I had completed a few circuits, slow landings, hovers and vertical landings it was fully dark and I hadn't properly figured out the cockpit lighting so I taxied in. My first flight in the YAV-8B had lasted just 30 minutes of which the last 10 were logged as official night flying!

A few days later I got a full 50-minute sortie. I confirmed the lack of top speed and got a bit more comfortable with the general handling and manoeuvrability, which was good if not quite as snappy as a GR3.

Not surprisingly, with the big wing it seemed to turn a lot tighter than the GR3. I then returned to the circuit well above hover weight for some slow landings. The interaction between the hot nozzles and the huge flaps seemed to be creating some sort of blown flap effect such that touchdown speeds seemed to be approaching that of a rolling vertical landing (RVL) while still well above hover weight.

After some discussion with the McDonnell Douglas people it was obvious that they didn't want us to keep flying what was now their only prototype without being able to complete a full evaluation. It was agreed that we would return to the UK and McDonnell Douglas would modify the one remaining YAV-8B to reduce the drag and, hopefully set up the engine better than the last one!

By April 1980 I was a Flight Commander on No 1(F) Sqn. I was told that the company had completed the necessary modifications to their prototype and were now ready for us to complete our evaluation. The same team set off again for Whiteman AFB and I for one was really looking forward to getting my hands on the YAV-8B again (I was also really looking forward to the excellent breakfasts at The Office in Knob Noster!).

This time the evaluation went smoothly. I flew the aircraft on five full sorties between 26 and 30 April, trying to cover the full range of likely operational environments. The modifications to reduce drag had

Bob's YAV-8B Flight Certificate.

transformed the aircraft and, although still not as fast as a GR3, it now had a top speed of well over 500 kts. Although the aircraft was not equipped with any weapon aiming avionics (the cockpit and avionic suite were still at the design stage) I carried out the full range of the current Harrier Force's attack profiles against simulated targets on Whiteman AFB. With 8 × 500 lb dummy bombs I was able to maintain an attack speed of 480 kts through the various manoeuvres. I also flew a 1-v-1 air combat sortie against an AV-8C (GR3 equivalent) flown by British Aerospace's chief test pilot, John Farley. Although, given that the company wanted us to buy the aircraft, I was never quite sure how hard John was trying. It quickly became apparent that the YAV-8B outperformed the earlier model in the close-in dog fight scenario.

One thing I never got used to was flying a prototype with full telemetry, including a live mike. I had a habit of either singing or talking to myself whilst flying and the test engineer could hear this and also see a real time readout of all my instruments. I was supposed to be limited to 12° degrees angle of attack during my flights. On several occasions I had pulled considerably more than that and said to myself,

unfortunately out loud, ‘Oh s**t I hope they didn't see that’. The test engineer's voice came straight back, ‘Oh yes we did!’

By the end of the evaluation I was convinced that, once fully developed, the AV-8B would make an excellent replacement for our ageing Harrier GR3 fleet. It was certainly easier and safer to fly and could take the same bombload twice the distance or double the bombload the same distance. It also had much improved STOVL and turning performance. I believe that Terry Nash also shared my opinion, although I did spot him gazing lovingly at the F-18 Hornet in McDonnell Douglas's factory!

I never got to fly the Harrier GR5/7 as by the time they were in service I had moved on to the Tornado. However, I think our evaluation was vindicated as the aircraft served us well in numerous conflicts from the late ‘80s, until some halfwit in the Treasury disbanded the fleet in 2010!

At least my US Marine Corps friends from my exchange tour at Cherry Point were happy. They couldn't believe their luck in receiving a whole fleet of not very old Harriers at less than 5 cents on the dollar! My only remaining claim to fame was that I was the only RAF front line Harrier pilot to have flown the ‘Big Wing Harrier’ in the 1970s!

OBITUARY

Air Marshal Sir Freddie Sowrey KCB CBE AFC

The death of our much admired founder and president Air Marshal Sir Freddie Sowrey aged 96, brings to an end the service record of a remarkable family who had served in the RAF for an unbroken period of 65 years.

His father, Fred, and two uncles had transferred in 1915 to the Royal Flying Corps and each saw considerable active service in France. Freddie – as he was always liked to be known – was the only son of Fred senior, the second of the brothers. He had shot down a Zeppelin over Essex in September 1916 and went on to be a highly decorated fighter 'ace' on the Western Front.

Sir Freddie.

The next generation of Sowrey boys also joined the RAF. Freddie's eldest cousin, John, became a fighter 'ace' in World War Two and retired as an air commodore and his younger cousin, Jimmy, was shot down flying a Hurricane in the Western Desert and was killed.

Sir Freddie joined the RAF at the first opportunity after leaving school in 1940. He trained as a pilot in Canada and on his return to Britain he flew Lysanders and Tomahawks in the army co-operation role before joining 26 Squadron flying Mustangs on reconnaissance sorties over France.

In October 1942 he was a patient at the RAF Convalescent Hospital housed in the Palace Hotel at Torquay. On the morning of Sunday, 25

October, the hotel was attacked by two German fighter-bombers. Nineteen staff and patients were killed; many were injured including Sir Freddie who had to be dug out of the rubble. After further convalescence he returned to 26 Squadron in December. When he finished his tour in November 1943 he had completed 200 hours flying Mustangs and Tomahawks.

He became a flying instructor before reporting to a Heavy Glider Conversion School where he was a Flight Commander and instructor on heavy gliders and their Albermarle tug aircraft. He was mentioned in despatches.

Freddie, as a squadron leader, with 615 Squadron's Honorary Air Commodore.

After converting to jet fighters, he joined 615 (County of Surrey) Auxiliary Squadron as the training officer in May 1946. Based at Biggin Hill, the squadron's honorary air commodore was Winston Churchill who lived at nearby Chartwell. The squadron became known as 'Churchill's Own'.

Sir Freddie served as an instructor at the Central Gunnery School before returning to Biggin Hill to take command of 615 Squadron flying Meteors. During his period in command the squadron was awarded the Esher Trophy, an annual award to the most efficient of the twenty-one Royal Auxiliary Air Force fighter squadrons. He was awarded the AFC, making him the fifth member of the Sowrey family to receive this award.

After two years in the Air Ministry, he took command of 46 Squadron, flying the delta-wing Javelin all-weather fighter in the

defence of the UK. His dynamic leadership and his excellence as a pilot led to the award of the Ingpen Trophy as the best night fighter squadron. Later in the year he led a formation of 90 aircraft of Fighter Command on seven consecutive days at the 1959 Farnborough Air Show.

After serving as the Personal Staff Officer to the Chief of Air Staff (CAS) Air Chief Marshal Sir Thomas Pike, he assumed command of the large RAF Transport Command base at Abingdon in December 1963. This provided a very different type of flying and, with his usual boundless energy and enthusiasm; he participated in every aspect of the base's operations. He flew the huge Beverley transport aircraft and the Hastings on worldwide routes and he made parachute jumps with the resident Parachute Training Squadron. On an enforced delay in Aden he took the opportunity to fly a Beverley of 84 Squadron (his uncle's former squadron) on re-supply sorties to desert airstrips. At the end of his tour he was appointed CBE.

After attending the Imperial Defence College, he was sent to Aden as the Senior Air Staff Officer in February 1966, two weeks after the Labour Government had announced the UK's withdrawal from the protectorate by the end of 1967. Typically, he completed a conversion course to the Hunter so that he could fly with the resident squadrons and 'see for myself' what up-country operations involved.

The air base at Khormaksar was one of the largest in the RAF and housed fighter, transport, bomber and helicopter squadrons. Sir Freddie was tasked with planning the final withdrawal, a complex operation involving the evacuation of thousands of personnel, including families, heavy stores, equipment and a phased withdrawal of the squadrons whilst maintaining an essential operational capability. Working closely with his navy and army colleagues the final plan was executed satisfactorily and, with his army counterpart, he was the last RAF man to step off Aden soil when he boarded the final Hercules to leave on 30 November 1967. Shortly after, Sir Freddie was appointed CB.

In February 1968, he returned to the MoD, this time to head a tri-Service team in the defence policy staff. With his fellow directors he was charged with reviewing the future size and shape of the UK's armed forces.

In May 1970 he was given responsibility for all RAF training matters, which included implementing radical changes to the training of officers at the RAF College at Cranwell. He was also fully involved

in planning and implementing the pilot training programme for HRH the Prince of Wales. As a 'hands-on' commander he took every opportunity to visit the flying schools and fly all the aircraft under his command.

As the Commandant of the National Defence College he was determined to develop the course for senior officers and offer opportunities for them to meet military, political and industrial leaders. He introduced a series of demanding exercises, all designed to identify those who could make the most significant contribution to the British military in their later appointments. Throughout all these changes he recognised the value of inter-Service exchanges at work and socially and he and his wife Anne were immensely popular.

For his final appointment in October 1977, Sir Freddie was promoted to become the UK Permanent Military Deputy to CENTO with headquarters in Ankara. He retired from the RAF at the end of 1980 having been appointed KCB.

With a childhood and long career spent in the RAF, he had a deep interest in the history of the service. He became the 'founding father' of the RAF Historical Society, its Vice-President and finally its President. He rarely missed the twice-yearly seminars when his infectious enthusiasm, military insights and personal anecdotes were a highlight of his concluding remarks. Shortly before his death on 20 July 2019, one of the Chief of the Air Staff's Fellowships had been named in his honour and at the Society's 2019 AGM Sir Freddie was able to personally present the first awards of the 'Sowrey Fellowship' to two junior officers.

Sir Freddie's inspirational and charismatic leadership and support will long be remembered.

GRP

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.

Airmen Died in the Second World War 1939-45 by Chris Hobson. The Naval & Military Press; 2019.

Wow!

This *enormous* database contains details of 128,920 members of the RAF, FAA, AAC and the air forces of other nations that flew either under RAF control or with the RAF as Allies. Thus, airmen from Australia, Canada, India, New Zealand, Rhodesia, South Africa, Belgium, Burma, the Caribbean, Czechoslovakia, Denmark, France, Greece, Malaya, the Netherlands, Norway, Poland, West Africa and Yugoslavia are included plus American airmen who served in British or Commonwealth units. Some other related organisations, such as the ATA, the ATC and BOAC are also included.

Entries cover *all* airmen and airwomen, not just aircrew, so they run from 'the two-tour Bomber Command veteran to the WAAF telephonist'. Nor are entries confined to 'air'-related incidents, thus there are, for example, details of 793 people who died in road traffic accidents and 26 who were murdered! Apart from the individual records, there is an 'Introduction' expanding on the methodology and including some interesting analyses tabulating, for example, monthly losses by each air service, total casualties by Command or Theatre, and for each aircraft type.

Needless to say, the foundations of this work lie in the records held by the Commonwealth War Graves Commission and the Air Historical Branch, but these have been extensively supplemented and amplified with information drawn from many other sources – there is an extensive international bibliography. The result is that, while there are, inevitably, some gaps, each individual is recorded, where appropriate, by: surname; forename(s); Service Number; rank; function/trade; service; base; command; unit; aircraft type and serial number; date of death; cause of death; age at death; native of; place of burial/memorial; honours and awards; and additional notes. Furthermore, despite the '1945' in the title, coverage actually runs on to 31 December 1947 to conform to the convention observed by the CWGC.

The content may be searched by any one, or combination, of the

fields noted above. Thus, for instance, 'Gibson' alone will produce 137 hits, but if you add 'Guy', it reduces to just one. The data provided includes the serial number of the aircraft in which he died, KB267, so, if you search for that number, it will take you to Gibson's navigator, Sqn Ldr James Warwick.

It may have been noticed that, unusually, the header to this review does not include a price. That is because there are two options – and it's a bit complicated. The work is available as a 9,360-page printed edition, presented in ten softback volumes at a cost of £456, or as a fully searchable DVD for £222. But this publisher occasionally runs 'special offers' and this reviewer acquired his DVD at the 'early bird' price of £150.

There is one minor downside to the DVD. Presumably to prevent 'piracy', the content cannot be permanently downloaded onto a PC – or if it can, this reviewer lacks the IT smarts to do it (which is definitely a possibility!) That means that you have to go through the downloading procedure each time you wish to interrogate the database. Once 'in', you can ask as many questions as you like, of course, but, if you log out or shut down the PC, you will have to start all over again and the process takes a couple of minutes. But, that said, a frustrating inconvenience rather than a real 'issue'.

The author, or perhaps compiler, spent some 20 years gathering and marshalling all this information and is to be congratulated on the result, as is the publisher for making it available. Between them, they have created an invaluable research tool, well-deserving of my initial 'Wow!'

CGJ

The First Helicopter Boys by David Taylor. Frontline-Books; 2019. £25.00.

Despite the RAF having first shown some interest in rotary wing aircraft in the 1920s, the technology took a long time to mature into something truly practical and an initial burst of early post-war enthusiasm soon began to fade away due to a lack of official interest. It was the outbreak of an insurgency in Malaya that led to a revival of interest in the potential of helicopters, initially for the morale value represented by their ability to evacuate casualties from deep jungle. It would be churlish not to acknowledge that the Royal Navy had been

ahead of the RAF in this respect and No 706 NAS's use of the Dragonfly in 1953, during severe flooding along the east coast and in the Netherlands, demonstrated just how useful and flexible the helicopter could be.

Although Journals 25 and 70 contain information regarding the RAF's use of rotary wing aircraft, the current 'bible' for those seeking a detailed analysis of the development of helicopters remains John Dowling's: *RAF Helicopters – The First Twenty Years* (HMSO, 1992). In recent times, most books dealing with the operational use of RAF helicopters have been personal accounts. Unfortunately, the 1950s, when helicopters first began to be deployed at home and overseas, is poorly represented in published works. This book begins to fill that gap.

The author, David Taylor, spent three years in the Far East working on helicopters, as a technician and volunteer crewman, as they gained increasing acceptance for evacuating casualties (the task for which they were first deployed), supplying remote areas and patrols, and redeploying troops. Since leaving the RAF, Taylor has been active in keeping the memory of those early days alive and *The First Helicopter Boys*, seeks to do this, its title resonating with Grub Street's lengthening series of type-related 'Boys' books.

As its sub-title, *The Early Days of Helicopter Operations: The Malayan Emergency 1947-1960*, indicates. Taylor covers the RAF and RN contributions to Operation FIREDOG with a brief account of the campaign, amplified in subsequent chapters by personal recollections contributed by both air and ground crew. Along the way the book covers the development and improvement of the aircraft, and operational issues, like supporting the Malayan police and their remote forts, before straying out of his time bracket to address some aspects of the mid-1960s 'Confrontation' with Indonesia. An interesting fact that emerges in the description of the contribution of No 848 NAS is that their Sikorsky S.55s, procured direct from the USA, were lighter than the licence-built version used by the RAF, mainly because of the different specifications of the materials used in their construction. Not a lot of people know that.

While the reminiscences of veterans provide a great deal of colour, reliance on 60 year-old memories can add a rosy glow. For example, Taylor accepts, without reservation, the story of Terry Peet, a pilot who, in the autumn of 1965 deserted the RAF, and his family, by pretending

to have drowned. In fact, Peet claims that his disappearance was effectively sanctioned by the CIA, although his own account fails to record a number of other fantasies, including his application to become an astronaut! That said, Peet did have an interesting story to tell of his time in Malaya during the emergency, but Taylor does not address this.

A 315-page hardback, the book features many monochrome photographs, embedded within the text, and there is a useful annex providing the fate of most of the individual helicopters involved. While always interesting, I found the story a little difficult to follow in places, because the narrative is sometimes chronologically inconsistent, making it difficult to determine exactly when a particular incident occurred. There are also instances of the prose style changing between passages of the text, which disturbs the flow – and suggests, perhaps, a lack of editorial attention on the part of the publisher.

Such criticisms as I make, however, do not detract from the fact that this is a very worthwhile addition to the story of the development of rotary wing aircraft. A complementary volume dealing with the early days of search and rescue would be equally welcome.

Taylor's book will be a valuable addition to my bookshelves. It is not, and does not claim to be, a cerebral thesis of political or military moment. It is an anecdotal, personal account and, as such, I recommend it because it fills a void in the published record.

Wg Cdr Colin Cummings

CHASTISE – The Dambusters Story 1943 by Max Hastings. William Collins: 2019. £25.00.

Max Hastings first tackled the World War II strategic bombing campaign in 1979 in his book *Bomber Command*. Discussing the balance sheet in his final pages, he concluded that 'Bomber Command was very well served by its aircrew, and with a very few exceptions, very badly served by its senior officers, in the Second World War'. Not surprisingly, that judgment did not go down well in the upper reaches of the RAF many of its very senior officers being survivors of that bitter campaign, where out of every 100 aircrew who served in Bomber Command, 51 were killed in action and only 24 survived apparently unscarred (the latter being a story in itself).

In his latest volume, he concentrates on Operation CHASTISE: 617 Squadron and the raids on the German dams in May 1943. He dedicates

the book ‘to the memory of the aircrew’ (56 of the 133 who had taken off from Scampton died on the raid and of the 77 who returned safely, just 32 survived World War II) and to ‘the men, women and children on both sides who perished.’ That dedication is a clue to the author’s approach: unlike many other accounts of this extraordinary story, he has researched and described not just the planning and execution of such an outrageously ambitious operation, but what happened on the receiving end, concluding that the attacks on the three dams imposed a ‘brief disruption rather than a crippling blow’ on the Nazi war machine.

But this 364-page book is a cracker: it hums along at a page turning pace interspersing the basic elements of the plan with much human detail. Much of the latter was new to me. 24 year old Guy Gibson had just received his second DSO; having already completed 172 sorties, he was exhausted, and was given just two months to create 617 Squadron, from scratch, to perform the most extraordinary military flying operation in history. Sir Arthur Harris’s deputy, Saundby, asserted ‘two weeks would provide sufficient time in which to train crews for this operation.’ Hastings writes that this ‘said more about his own and his chief’s insouciant attitude to Chastise than about their understanding of the supreme challenge their flyers were about to be invited to undertake.’ But then, I suppose when you are commanding a bombing force every night of many hundreds of aircraft and thus thousands of aircrew, such insouciance is understandable.

The chapter describing Gibson’s personality, his hopes and fears (all described so well in Ben Shephard’s *A War of Nerves* (2000) and Richard Morris’s *Guy Gibson* (1994)) is heart-breaking to read.

Members will know the essence of the story and will find the descriptions of the build-up to the raids, the finding and training of the aircrews, the inventiveness of Barnes Wallis, the series of low level night exercises close to home, the operation itself, the recovery to Scampton of the survivors, not very surprising but all these aspects are injected with new detail. For example, (as the author has written elsewhere), ‘far from being all volunteers as legend suggests, half the dam busters were drafted, some unwillingly. Several had completed only a handful of operations and three had flown none at all. This made Gibson’s achievement all the more amazing.’ Gibson and his crew, the CO being so busy, had flown less ‘than twenty daylight hours, just four and a half in darkness’ while they were training for the operation.

Max Hastings admits that he has found a contradiction in telling the story. While, not surprisingly, we tend to concentrate on the extraordinary heroics of the venture, he is also very much taken by the effect of the raids on the casualties on the ground, most of whom were slave labourers trapped in camps just below the dams. To help assuage any guilt we might feel, he has drawn on the words of Professor Sir Michael Howard namely, 'Nobody can wage war in a struggle for national survival and keep completely clean hands. We make war as we can, rather than as we should.'

By chance, as I began writing this review, I read *The Times* obituary of Noble Frankland CB CBE DFC who had been a 21 year-old Lancaster navigator on 50 Squadron at RAF Skellingthorpe, completing some 84 missions and going on to be the author, along with Charles Webster, of the official *The Strategic Air Offensive Against Germany 1939-1945*. When he lectured my generation at the RAF Staff College Bracknell, I remember him saying, 'People prefer to feel about the strategic bombing offensive rather than to know about it.'

I suspect Dr Frankland would very much approve of Max Hasting's latest attempt to help us know about the raid.

AVM Nigel Baldwin

Blue Streak: Britain's Medium Range Ballistic Missile by John Boyes. Fonthill; 2019. Price £25.

Almost the first thing to be seen beyond the security gate at RAF Spadeadam in Northumbria is a giant stainless steel tube positioned on a road trailer. This is the body of a Blue Streak missile. Or, to be more precise, the Booster Stage of Blue Streak. This shiny cylinder is about 16 metres long with a diameter of perhaps 3 metres. It is made up of thin stainless steel sheets, reinforced by longitudinal stringers that give the body rigidity. Closer inspection shows the rocket body has no motor or warhead in place. It is essentially a set of connected fuel tanks, with a liquid oxygen tank occupying the front half of the missile and a kerosene tank making up the tail portion. This giant 60 year old cylinder is a monument to Britain's attempt to develop a ballistic missile.

Blue Streak was an intermediate range ballistic missile developed in the UK from the early 1950s. The rocket was intended to replace the increasingly vulnerable V-bomber force as Britain's independent deterrent. The missile reached an advanced stage of testing before it was

cancelled in April 1960. RAF Spadeadam was used for engine testing of the missile on specially built concrete test beds which survive at the site in an excellent state of preservation. The immaculately kept buildings at Spadeadam are central to the current role of the base as an Electronic Warfare Unit. But heavy lift cranes in the sheds on the base also reveal their previous role as a missile assembly area.

Blue Streak is the subject of this thoroughly documented treatment by John Boyes. The book covers technical development of Blue Streak, the choice of nuclear warhead and the test regime. The lucid and readable narrative is largely based upon National Archive sources and contributions to the British oral history of rocketry programme published in the journal *Prospero*. It is particularly strong on the political debates surrounding the British deterrent in the period.

A special feature of the book is an extensive coverage of the underground missile silos proposed for the operational deployment of the Blue Streak missile (prefigured in *Journal 58*, pages 89-104.) It was argued that blast proof silos were needed because otherwise the Soviets would not believe the threat of retaliation was credible. A chapter of 23 pages outlines the design evolution, likely location and prototyping of these silos. The rockets were to be stored underground, already fuelled with 27 tons of kerosene. Once a countdown had started liquid oxygen would be pumped in under pressure from compressed nitrogen. Sixty sites were required, although each silo would have used concrete equivalent to 10 to 20 miles of two lane motorway at a time of concrete shortage. The dilemma facing the Government in the late 1950s was clear: either Blue Streak or 1,000 miles of new motorway.

The title of the book – *Blue Streak* – is something of a misnomer as the second part of the volume is given over to the American Skybolt missile. Skybolt was to be carried by RAF V-bombers as a stand-off missile, effectively a successor to the Blue Steel stand-off bomb developed by Avro and carried by Vulcans and Victors Development reached the point at which a Vulcan flew with two dummy Skybolts under its wings, culminating in trial drops at West Freugh. But further development was cancelled when the US withdrew from the project, leaving the way open for Macmillan and Kennedy to negotiate the supply of the American Polaris missile to the Royal Navy.

This book has many strengths. It is based on comprehensive research and the endnotes are entertaining reading. There are 45 illustrations in

black and white and colour and some 30 valuable line drawings which enhance the narrative considerably. The photos include the de Havilland test facility at Hatfield, Hertfordshire. As the *Daily Express* remarked at the time, the Hatfield test site was surrounded by security and a chain link and barbed wire fence, yet development work at the site could be readily seen from the road.

The book neglects technical aspects of the missile including design selection, the choice of rocket motors, propellant choice and the role of US design advice. Development work at Rocket Propulsion Department Westcott in Buckinghamshire is covered only briefly in five pages and there is little discussion of the respective work of Westcott and the lead contractors de Havilland and Rolls-Royce.

There are one or two glitches. John Boyes asserts that German scientists returned home from Westcott in 1948. An interview by this reviewer with a Senior Scientific Officer who worked at Westcott suggests there were at least two German scientists and a draughtsman still working there in the mid-1950s. One of these scientists was instrumental in discouraging the use of fluorine as a rocket propellant following lively German experiences with flame-throwers in the Second World War. There is perhaps more to be found out about ballistic missile development at Westcott.

The book provides an excellent introduction to the debates surrounding Britain's independent nuclear deterrent over the decade from the mid-1950s to the mid-1960s. There is a useful glossary of terms at the beginning and seven appendices covering schematic drawings, the relative performance of weapons and showing the layout of an American Titan 2 missile site – strikingly reminiscent of Blue Streak silo designs. The absence of an index is frustrating. Geeks will doubtless look elsewhere for the technical detail, but this is an enjoyable, straightforward and informative account of the issues.

Jonathan Aylen

Shackleton Boys, Volume 2 by Steve Bond. Grub Street; 2019. £25.00.

This is the second volume of tales from Shackleton operators and maintainers in the familiar 'Boys' format. I should declare an interest in that I, again, made a small contribution to this volume. Volume 1 was reviewed in Journal 71. Volume 2 deals, in seven chapters, with the Shackleton squadrons and bases overseas, during the 1950s, '60s and

‘70s: Gibraltar; Changi in Singapore (a chapter from the aircrew and another from the groundcrew); Gan in the Maldives; Luqa on Malta; Khormaksar, Aden; and Sharjah in the Trucial States (now the United Arab Emirates). An eighth chapter covers the Shackleton in the South African Air Force (SAAF). As always, most of the text consists of stories and anecdotes from the ‘Boys’ – and they were all boys in those days – with the author, Dr Steve Bond, providing the essential historical and political context, and the occasional explanation. The book is very well illustrated, with 16 pages of mostly colour photographs and more than a hundred other photographs and illustrations scattered throughout the text. Poignantly, the final two pictures are of the remains of the SAAF Shackleton MR3 in the Western Sahara (see Chapter 8) and the Sin Cowe Cross that was placed by Chinese fishermen on the grave of Flight Sergeant David Dancy on Sin Cowe island (see Chapter 2 and Finale). The fishermen had recovered Dancy’s body from the sea after witnessing Shackleton MR 1, VP254 crash in the South China Sea. The book has three appendices covering: overseas squadrons and other units; a production list by mark and serial number; and overseas accidents. Also included are a useful list of abbreviations and code names, a select bibliography, links to squadron association and other websites, and an index.

The Foreword, by Wg Cdr Jerry Evans, a contemporary of mine in the Shackleton Force, takes us on a rhapsodical journey through the bases, from Gibraltar in the west to Changi in the east. He sets the scene for the tales that are to come, at a time when an overseas posting ‘somewhere warm’ was highly prized, despite the heat and humidity, and the mosquitoes and sandflies. He makes the point that the bond between Shackleton people, operators and maintainers, was just as strong in the squadrons scattered across half the globe as it was in the UK squadrons. This bond was sustained because personnel were posted back and forth between home and overseas squadrons and detachments from the UK frequently supplemented in-theatre forces. While the overseas squadrons maintained their maritime credentials with anti-submarine warfare (ASW) training and exercises, ASW was not as important a role for them as it was for the UK squadrons. The focus of operations from Khormaksar and Sharjah was colonial policing operations against rebels in the Yemen and Oman. In Changi, ‘Confrontation’ with President Sukharno’s Indonesia dominated the

day-to-day operations of 205 Squadron between 1963 and 1966. Changi Shackletons also spent time on anti-piracy patrols. Search and Rescue (SAR) was an ever-present commitment for all the overseas Shackleton squadrons and several of the tales are about memorable SAR incidents. Another major theme of several anecdotes is the ferry flying to take aircraft back to the UK for servicing or modification and to deliver new or modified aircraft to squadrons. These flights, often through unfamiliar airfields, tested the serviceability of the aircraft and the patience and skill of the crews, air and ground. In the Finale, Sqn Ldr Tony Smart recounts an epic trip to deliver a Shackleton from Ballykelly in Northern Ireland to Majunga in Madagascar. To quote his summary: 'We took 52 days to get the aircraft to Majunga, with an average speed of less than 5 miles an hour. Total flying time was 45 hours and 30 minutes, of which 2 hours and 35 minutes were air tests. We used nine engines, the four we set off with, No 1 replaced in Djibouti, two No 2s replaced in Mombasa, and two No 4s replaced in Mombasa. No 3 went all the way despite the shut-down! We also used one propeller oil seal set on No 2 engine in Malta, one propeller assembly replaced on No 2 engine in El Adem, and one propeller assembly replaced on No 1 engine in Mombasa.' Tony Smart goes on to say that 'this episode was not typical of my experience flying the Shackleton.' However, many of his contemporaries would have experienced something similar, if not so extreme. I 'suffered' a stay of a week in Nairobi, en route to Majunga, waiting for a replacement engine to be delivered.

I thoroughly enjoyed this book. It is full of interesting and entertaining accounts, and it presents an authentic picture of overseas life in the Kipper Fleet during that period. I think that this volume is likely to be more accessible to the general reader than Volume 1 because many of the contributions are longer and better written, while Steve Bond has done a good job of combining accounts of the same incident from different observers, which offers a more rounded story. I was slightly disappointed that there were only seven contributors to Chapter 8 on the SAAF Shackletons as I am sure that there is much more to tell about the 27 years of Shackleton service in South Africa. The author mentions, in his introduction, that there are many more Shackleton stories to be told and that he intends 'to ensure that as many as possible get the airing in print they deserve.' So possibly we can look

forward to Volume 3. In the meantime, Shackleton Boys Volume 2 is a good read and I strongly recommend it.

Air Cdre Bill Tyack

Typhoon to Typhoon by Chris Gibson. Hikoki; 2019. £29.95.

Having previously examined the post-war evolution of the deterrent, air defence, airborne SIGINT collection and the maritime and transport roles (see Journals 51, 55, 59, 61 and 66), Chris Gibson's sixth essay is subtitled *RAF Air Support Projects and Weapons Since 1945*.

I can begin this review by recycling, from Journal 66, my opening remarks on the previous instalment. 'Compared to the earlier volumes in the series, this one shows signs of having been rushed into print without having been adequately proof-read. This manifests itself in two ways. First, there is a degree of repetition (*and secondly there is an excessive incidence*) of omitted definite and/or indefinite articles and amended passages with some of the original text still present.' I noted more than forty of these and the double-takes that they provoked made for a bumpy ride in places. There is another issue. The narrative in this book is particularly rich in acronyms and initialisms. Some of these take root and are absorbed into every-day *patois* within some sections of the military community (although they may remain opaque to others), but many prove to be short-lived and fade away as a project or technique evolves or is abandoned. To avoid the reader having to flick back a couple of pages to remind himself what TCA or MMW or PSA (no, it's not the Property Services Agency – nor, in the world of offensive air, does SAR translate as Search and Rescue) stood for, this book needed a much larger glossary than has been provided.

Having got that off my chest, what of the actual content? It follows pretty much the pattern established by the preceding books. The first two chapters outline the 'problem' – essentially how to counter an armoured thrust by the Warsaw Pact if the Cold War were to turn hot – and provide an overview of the evolution of low attack aeroplanes (many of them unbuilt projects) during and since WW II. Thereafter the story considers the development and employment of the Hunter, Jaguar, Harrier, Buccaneer, Tornado and Typhoon in the context of ground attack. Running in parallel is the associated story of the increasingly sophisticated weapons involved, starting with the 3″ rocket projectiles and 20 mm cannon of the 1940s and progressing via the increasingly

sophisticated and dedicated BL755, JP233 and ALARM to today's very accurate Paveway, Brimstone and Storm Shadow. Along the way some attention is paid to the evolution of, often pod-mounted, tactical reconnaissance equipment and latterly the increasingly capable (at least in a benign air environment) 'drones'.

Three appendices discuss: the evolution of each generation of anti-tank weapons and the armour developed to counter them, which introduces an alphabet soup of RHA, AFPSDS, HEAT, HVAP, ERA, HESH, etc (these are in the glossary, but you can see why we need one); base burning (you will have to read the book); and an essay on the gunship concept, essentially, the USAF's AC-130 and, latterly, helicopters like the Cobra, *Hind* and Apache.

The mainstream developments will be relatively familiar, of course, but, while acknowledging these, this author is more interested in the blind alleys that had to be explored before the way ahead became clear. He identifies and examines the constant shift in the balance between roles – interceptor or mud-mover? Traditionally, the RAF's ground attack aeroplanes were failed (like the Typhoon of WW II) or superseded (like the Hunter) interceptors. The ideal would have been an aeroplane that could do both equally well but attempts to create a truly multi-role aeroplane failed to materialise – until, arguably, today's Typhoon FGR4.

All of this is discussed in satisfying, if sometimes slightly confusing, detail – on a couple of occasions there was such a lot going on that this reviewer lost the plot and had to go back a few paragraphs to pick up the thread as, for instance, when ASTs 396, 403, 409, 410 and 414 were eclipsing each other in relatively short order against a background of shifting international involvement – the French had a habit of joining projects and then withdrawing because they always wanted their aeroplane to be carrier-capable and on one else did. That said, the many illustrations both clarify and amplify the text admirably. These include timelines outlining the evolution of the Jaguar, Harrier, Tornado and Typhoon programmes from initial concept, via hardware to, in the case of the first three, withdrawal from service. There are some 30 additional diagrams which illustrate, for example, the way in which a particular weapon worked and/or its delivery profile. More than 150 photographs are complemented by in excess of 100 three-view general arrangement drawings of real or imagined aeroplanes.

Incidentally, the uniformly excellent diagrams and drawings have all been rendered by the author; Gibson is one of the last practitioners of, what has almost become, the lost art of the '3-view GA' – why has the rest of the aviation publishing world abandoned them?!

The production quality of this 240-page A4 hardback is second to none – gloss paper throughout. The book is a pleasure to handle and an interesting and informative read.[1] What's not to like? Recommended. **CGJ**

Lone Wolf by Andy Saunders with Terry Thompson. Grub Street; 2019. £20.00.

Lone Wolf is the story of the short, but remarkably successful, combat career of Flt Lt Richard Playne Stevens DSO DFC*. Born in 1909, he had some difficulty in settling after leaving school in 1928. Details are sparse, but he is known to have spent some time in Australia. He failed to put down roots there and by the early 1930s he had enlisted in the Palestine Police Force. This too turned out to be a relatively brief interlude and he was back in England by 1935 when he married Mabel. It is not clear what he did as an occupation, but he took flying lessons, gaining his RAeC Certificate in 1936. By 1938 he was being employed as a pilot by Air Couriers, moving on to the similarly Croydon-based Wrightways in 1939. Much of the work during the run-up to war involved night flying on Air Ministry contracts to provide training for searchlight crews. In the meantime, Stevens had enlisted in the RAFVR but, even after war had been declared 'the system' was content to let him carry on with this low-key calibration flying. That was hardly surprising as he was 30 years of age, way above the maximum age for recruiting RAF pilots and the ATA would seem to have been a more appropriate billet. Nevertheless, by the spring of 1940, Stevens had been mobilised and he was now flying as an RAFVR sergeant. At much the same time, the company's aeroplanes had been impressed for military service and camouflaged and they were now on charge to No 110 Anti-Aircraft Co-operation Wing at Ringway but, as the unit's title

[1] There is an RAFHS cherry on this cake. On page 4, Gibson cites, as the overriding theme of his book, a statement made by Sir Richard Johns on 13 June 2018 – 'Single role aircraft are passé' – and he refers to this twice in the subsequent narrative. Although the source is not attributed, just for the record, it is from this Society's 2018 AGM – see page 14 of Journal 71.

implies, the job was the same. Stevens began badgering the authorities to let him fly fighters.

His relationship with his wife was under some strain by this time, but in 1938 she had presented him with twins, upon whom he doted, especially his daughter Frances. In the summer of 1940, Mabel and the children were involved in a *Luftwaffe* strafing attack and, although they were unharmed, from then on Stevens' war took on a very personal dimension. In October, a domestic accident, involving a paraffin heater, led to the death of 22-month old Frances. Stevens blamed Mabel for this and he never spoke to her again, but the tragedy seems to have reinforced his determination to take the fight to the enemy. Despite his age, Fighter Command's losses during the summer meant that Stevens was now an acceptable replacement and after a short course at Suttons Bridge he was commissioned in November 1940 and posted to No 151 Sqn. Although he flew its Defiants from time to time, the squadron also maintained a flight of Hurricanes and these became Stevens' mounts.

He made his first claims in January 1941. He died in the following December, seemingly by flying into the ground in the course of an intruder attack on Gilze-Rijen. By then he had become the most successful night fighter pilot in the RAF. His final tally was 15½ confirmed, two probables and one damaged – all scored while flying a Hurricane in the dark. On three occasions he scored twice in a single sortie. His success was attributable to a number of factors, primarily his remarkable night vision, and his aggressive attitude towards the enemy. He was the archetypal 'loner', partly because he was so much older and far more experienced, in terms of flight time, than his colleagues – including his COs – and partly because of his single-minded dedication to the task in hand – killing Germans.

As a result of wartime publicity (propaganda) some of the information that appeared in the press was inaccurate but, through repeated recycling, these inaccuracies have tended to become 'facts'. Furthermore, some confusion over a Sgt Stevens (probably *Geoffrey*), who served with 151 Squadron for few days in early September 1940, led to a misconception that he must have been *Richard* 'Cat's Eyes' Stevens, who was therefore, by definition, a 'Battle of Britain pilot' and he has been repeatedly represented as such ever since. This was simply not the case, however, as the author makes plain. The waters were muddied further by some mumbo jumbo to do with a prominent

wartime medium, Estelle Roberts, whose misinformation was given some credibility by being endorsed by Air Chf Mshl Dowding, who believed in spiritualism (and fairies). The author of this, well-written, typo-free, book has clarified the picture by exploiting the extensive archive, including correspondence with the Stevens family, built up over some thirty years by the late Terry Thompson. There are still some grey areas, especially in the pre-war years and to do with some aspects of Stevens' private life, but his wartime career is now sharply focused.

Embedded within the narrative of this 160-page hardback, are about 90 illustrations, including several of Stevens' victims, along with all of his combat reports; appendices include a summary of his career/postings, a table listing his victories and the citations for his three decorations.

Recommended.

CGJ

A Spy in the Sky by Kenneth B Johnson. Pen & Sword (Air World); 2019. £19.99.

In February 1941, Kenneth Johnson joined the RAF at the age of 18. A rather naïve youth, with limited ambition and few expectations, he was twice routinely interviewed with a view to selection for aircrew and failed both times. Nevertheless, and much to his surprise, four months later, he was posted to No 13 ITW to begin the pilot training sequence. Initially hesitant, his confidence increased as it gradually became apparent that he had a natural affinity for flying which eventually led to his posting, as a sergeant pilot, to photo-reconnaissance Spitfires. He flew initially from Benson before being commissioned and moving to No 682 Sqn in North Africa in 1943. That is the substance of the story told in this 158-page hardback, although a brief postscript notes that he subsequently flew with No 8 (PR) OTU as an instructor and on Met duties with No 519 Sqn before relinquishing his commission, at Keresley Grange, in February 1945.[2] He emigrated shortly after the war and had a successful career in the defence and aerospace industries in North America. The book ends with a useful summary of his operational flying and his complete service record, ie his postings.

The book is something of a curate's egg. This one actually has two

[2] Johnson identifies this unit as the Air Crew Despatch Centre, which was actually at Heaton Park; Keresley Grange was the location of the Air Crew Disposal Unit. **Ed**

bad parts. First, the writing, which is excessively repetitive. A rigorous editor could significantly reduce the page count. The other problem is the bad-tempered tone of the story-telling. Johnson appears to have been somewhat intolerant, and the lack of appreciation of his achievements clearly rankled. He was also unimpressed by, what he perceived to be, the relative incompetence of some of his immediate superiors. This was particularly marked while he was an NCO when he was flying exactly the same missions as officers while resenting the fact that he was not afforded the same degree of respect. That said, his impatience was surely justified on at least one occasion; he was commissioned in February 1943 but not informed of this development until as late as May! He was equally impatient over being flown back to the UK, because he was now an officer, to sort out a problem with an overdraft on a bank account – that he had not opened! – and then sent back to North Africa again. Was this time-wasting interlude *really* necessary? Johnson thought not, and he was probably right. He was also dissatisfied with the state of some of the RAF's logistic back-up in North Africa, in marked contrast to that of the USAAF, with which his squadron was effectively embedded within a joint-service wing. Apart from a notable lack of MT (reportedly limited to one 15 cwt Dodge pick-up, supplemented by illegally impressed abandoned *Kubelwagens* – which the authorities kept confiscating!), the aeroplanes that he was obliged to fly while operating over the Mediterranean tended to be unreliable and cameras sometimes failed to work – and if that was the case, he was clearly right again.

That said, there are some inconsistencies which suggest that the book was written from memory, rather than from records. For example, according to No 682 Sqn's F540 for 9 May 1943 Johnson, brought back photos of Maddelena, whereas his recollection is that his cameras 'failed to operate'. Similarly, Johnson says that his cameras had been incorrectly installed on 10 June and had failed to operate on 19 July, yet the F540 lists the targets covered on both occasions. There are some other incidental niggles which also tend to undermine one's confidence, eg the HQ he visited at Gillingham, was of No 16 (not 17) Gp; his airfield at 'Childs Arcul' will surely have been High Ercall; the folk song is about Widdecombe (not Scarborough) Fair; the MU at Ternhill was No 24 (not 3), and did Spitfires really use an 'APU'? – I would have thought a 'trolley acc'. Some names crop up that don't work, eg

his Fg Off ‘Cline’ was actually H W Clyne and his Sqn Ldr ‘Sunnox’ should probably have been C E Sunnucks. The references to himself and two colleagues from his hometown, Leicester, regarding themselves as the ‘Three Caballeros’ in 1941 and ’42 seem anachronistic, as the term derives from the title of a Disney film that didn’t appear until 1944 – false memory syndrome, perhaps.

But those issues aside, what of the good part – of the egg. There is much to appreciate in the narrative. His description of his progress through pre-EATS flying training in the UK is illuminating as are his accounts of each of the nineteen operational sorties that he flew, including one, from Benson, that ranged as far as the Polish border. He also ferried two Spitfires from the UK to North Africa via Gibraltar which were interesting experiences. We learn nothing of the arts of aerial photography, but something of the trials and tribulations of flying on ops in unarmed aeroplanes – Johnson is very honest about his fear of the risks involved, but he never permitted this to deter him.

It is difficult to recommend this book wholeheartedly because the repetition and tone make it a rather uncomfortable read. That said, however, its descriptions of training flying and of the conduct of solo PR sorties, and one man’s personal recollections of his time in uniform, do provide some useful insights into life in the wartime RAF.

CGJ

ROYAL AIR FORCE HISTORICAL SOCIETY

The Royal Air Force has been in existence for one hundred 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 20-year rule, although in significantly reduced quantities since the 1970s. 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 RAF officer or airman, a member of one of the other Services or an MOD civil servant. 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
2017	Wg Cdr D Smathers
2018	Dr Sebastian Ritchie

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
1 Park Close
Middleton Stoney
Oxon
OX25 4AS
Tel: 01869 343327

MEMBERSHIP SECRETARY
(who also deals with sales of publications)
Wg Cdr Colin Cummings
October House
Yelvertoft
Northants
NN6 6LF
Tel: 01788 822124

TREASURER
John Boyes TD CA
70 Copse Avenue
West Wickham
Kent
BR4 9NR
Tel: 0208 776 1751

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