

**ROYAL AIR FORCE  
HISTORICAL SOCIETY**



**JOURNAL**

**23**

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*\*Ex Officio*

## Abbreviations

AA	(Soviet) Air Army
AAFCE	Allied Air Forces Central Europe
ACGS(OR)	Assistant Chief of the General Staff (Operational Requirements)
AI	Air Interception (Radar)
ASTOR	Airborne Stand-Off Radar
ATREL	Air Transportable Reconnaissance Exploitation Laboratory
BAOR	British Army of the Rhine
BMH	British Military Hospital
BRIXMIS	The precise meaning of this acronym changed slightly with the passage of time but in later years it appeared on the unit's letterhead as the British Commanders'-in-Chief Mission to the Soviet Forces in Germany. For the sake of uniformity, this version will be used throughout in this Journal.
BSSO(G)	British Services Security Organisation (Germany)
C2	Command and Control
DDR	East Germany - <i>Deutsche Demokratische Republik</i>
DIS	Defence Intelligence Staff
ECM	Electronic Counter Measures
EGAF	East German Air Force
FCO	Foreign and Commonwealth Office
FLM	French Liaison Mission
GCHQ	Government Communications Headquarters
GDR	German Democratic Republic, ie DDR in English
GRU	Red Army Intelligence Directorate - <i>Glavnoje Razvedyvatelnoje Upravlenie</i>
GSFG	Group of Soviet Forces in Germany
IA	Imagery Analyst
IR	InfraRed
IRLS	InfraRed LineScan
JARIC	Joint Air Reconnaissance Intelligence Centre
JIC	Joint Intelligence Committee
JIC(G)	Joint Intelligence Committee (Germany)
JSPI	Joint School of Photographic Interpretation

KGB	(Russian) Committee for State Security – <i>Komitet gosudarstvennoy bezopasnosti</i>
LOROP	Long Range Oblique Photography
MAREL	Moveable Air Reconnaissance Exploitation Laboratory
MFPU	Mobile Field Photographic Unit
MTI	Moving Target Indicator
NBC	Nuclear, Biological, Chemical
NOFORN	‘No Foreign Eyes’ - US national security classification
NVA	(the East German) National People’s Army – <i>Nationale Volksarmee</i>
OP	Observation Point
ORBAT	Order of Battle
PRA	Permanent Restricted Area
R&D	Research and Development
RRF	Radar Reconnaissance Flight
RSRE	Royal Signals Research Establishment
SERB	Soviet External Relations Bureau
SIS	Secret Intelligence Service
SLAR	Sideways Looking Airborne Radar
SOXMIS	Soviet Exchange Mission
<i>Spetznaz</i>	Soviet Special Forces – <i>Spetsialnoje Naznachenie</i>
<i>Stasi</i>	(East German) State Security Service – <i>Staatssicherheitsdienst</i>
TASM	Tactical Air-to-Surface Missile
TRA	Temporary Restricted Area
USMLM	United States Military Liaison Mission
<i>Vopo</i>	(East German) People’s Police - <i>Volkspolizei</i>

## **COLD WAR INTELLIGENCE GATHERING**

**RAF MUSEUM, HENDON, 18th APRIL 2000**

### **WELCOME ADDRESS BY THE SOCIETY'S CHAIRMAN**

**Air Vice-Marshal Nigel Baldwin CB CBE FRAeS**

Good morning ladies and gentlemen. It is a pleasure to welcome you and to see so many of you: we have about 150 present which is probably a Society record.

Straightaway, let me thank Dr Michael Fopp and his Museum staff for their usual welcome and efficiency. As I have said many times before, the Society would hardly be able to operate without their help.

Today's programme leads naturally on from a symposium held four years ago at Bracknell when we discussed Air Intelligence, largely during WW II but also running into the immediate post war period. The written record of that seminar makes fascinating reading. We still have about fifty copies available which Jack Dunham will happily sell off; he is not here today but do approach me or Jeff Jefford if you would like one.

The Chairman on that occasion was Sir Michael Armitage who, over some of the time we are going to discuss today, was Chief of Defence Intelligence. So I am confident that he will be able to keep us on track. I am most grateful to him for taking the task on a second time.

Before I hand over to him, one more 'thank you', to Graham Pitchfork who has put the programme together and done most of the worrying. It is never easy to deal with intelligence gathering, especially in an open forum such as this. But he has stuck at it and I know that we are going to have a stimulating day and that the written record will match the standard set by its predecessor.

Sir Michael, over to you.

## **INTRODUCTION BY SEMINAR CHAIRMAN**

### **Air Chief Marshal Sir Michael Armitage KCB CBE**

As I think you can see for yourselves, we have had an excellent response to our invitations to attend this seminar, and indeed I believe we can claim a record turnout for the Royal Air Force Historical Society. So, a warm welcome to you all, and I think we can promise you a very worthwhile day here at Hendon.

This is the third seminar specifically on Intelligence that our Society has held. As though to emphasise the vital place of Intelligence in Defence, our very first seminar was on 'The Intelligence War and the Royal Air Force', with a lecture in 1987 by that very engaging man, Professor R V Jones. That occasion dealt with the Second World War, in common with most of the Society's subsequent efforts to analyse our own history.

Our second seminar on the subject of Intelligence was held just four years ago, in March 1996. Most of the topics covered on that occasion also dealt with the Second World War, but by then the Cold War was six years behind us, and it had become possible to discuss, at least some, aspects of what had for forty or fifty years been pretty sensitive stuff. As a result, we were treated to a talk on Strategic Post-War Air Intelligence, which was a first-hand account of the RAF Special Duties Flight. This unit was equipped with North American RB-45Cs, in RAF colours, which it used to make overflights of Eastern Europe and the Soviet Union in the early 1950s. I'm very glad to say that the speaker on that occasion, Sqn Ldr John Crampton, is with us again today, and I hope he will feel able to add his almost unique experience to today's proceedings.

These days, with the Cold War now almost ten years behind us, it is becoming a little easier to discuss some of the Intelligence activities that were spawned during that very long confrontation. I say 'a little easier', because many wraps must remain in place, and for at least two reasons. First, the rigidities of the Cold War have been replaced not by universal harmony, but by the many instabilities and uncertainties in today's world. Much of what had been our Cold War Intelligence apparatus, and many of its techniques, must remain an essential part of our national and international defence posture. Secondly, the existence



of our close Intelligence links with allies in general and with the United States in particular will be well known to this audience. There are bound to be aspects of past and present UK Intelligence activities that our allies would prefer to see kept under wraps, and we need to bear those sensitivities in mind. For both of these reasons we may therefore find that there are constraints on our question and discussion periods, and I am sure you will all appreciate that this must be so.

Nevertheless, and on the positive side, today we can deal with three main topics. First, we have the operations of BRIXMIS during the Cold War, BRIXMIS being, as I expect everyone here will know, the British Commanders'-in-Chief Mission to the Soviet Forces in Germany. That fascinating subject will take up the whole morning. Then, second, we shall have a presentation on airborne radio surveillance. Third, we have presentations on photographic reconnaissance operations, including some mention of reconnaissance from space.

There are 45 minutes for questions and discussion at the end of the morning session, and there will be another 45 minutes for discussion right at the end of the day. It will help the smooth flow of the programme if you could keep most of your questions for those periods.

So to our first presentation, and we have a team of four speakers to talk about BRIXMIS.

## BRIXMIS- HISTORY AND ROLES

### Group Captain Richard Bates



*After Cranwell, Dick Bates flew Meteor night fighters in Germany, instructed at the Oxford UAS and was an ADC in Coastal Command. He then served for several years in the transport world, including a secondment to the Kenya Air Force, an exchange tour with the USAF and command of RAF Brize Norton. In 1981 he was appointed Deputy Chief of BRIXMIS, before taking over as Head of the Intelligence Branch at*

*HQ Strike Command.*

As a squadron pilot at Royal Air Force Ahlhorn in the 2nd Tactical Air Force of the late 1950s, I knew nothing of BRIXMIS' activities. In the early 1980s, as Deputy Chief of the British Mission, we were briefing RAF Germany front-line squadrons on the Mission's capabilities and taking orders for specific information to aid their operational planning.

Until it was consigned to history on 10th December 1990, the Mission's ponderous official title was the British Commanders' -in-Chief Mission to the Soviet Forces in Germany. This was abbreviated almost immediately to become 'BRIXMIS', or more simply to those serving in Berlin, 'The Mission'. Beyond Berlin and the wider intelligence community, the unit was not well known, and its activities and product were shielded behind a need-to-know screen. This is surprising, in some ways, because the Soviets certainly did know the basics of the operation, sharing, as they did, their own greatly valued reciprocal Mission in West Germany, known as SOXMIS.

In his book, *Beyond the Frontline*, Tony Geraghty refers to BRIXMIS as one of the great success stories to emerge from the uneven fabric of British intelligence-gathering after the Second World War. Because the Mission was in the business of collecting and recording military hardware and the way the Soviets handled it, there were no subtle distinctions, no shades of grey, when assessing its success or failure. This was the world of Bulldog Drummond rather than that of George Smiley.

The roots of BRIXMIS can be traced back to a section of the Anglo-Soviet-US 'London Agreement' of 14th November 1944, which the French were also invited to sign in March 1945. Entitled, 'The Control Machinery in Germany', this document confidently anticipated the defeat of the Third Reich. Article Two of the agreement stated that the Commander-in-Chief of each zone of occupation would have attached to him military, naval and air representatives of the other two CinCs for liaison duties.

To begin with, these duties were mundane, unorthodox and not controlled by reciprocal rules until September 1946 when the Allied Liaison Agreement was endorsed in Berlin by the Deputy Military Governor for the UK Occupation Forces, General Robertson, and by Colonel-General Malinin on behalf of the Soviets - The 'Robertson-Malinin Agreement'. This agreement remained unaltered, with every word, full stop and comma intact for the next forty-four years. A copy was carried by all British Mission officers as the authorising licence for their liaison visits to the Soviet Zone of Germany, later the DDR. In essence, it ensured freedom of travel and communications with headquarters, these provisions being reciprocated for the Soviet Mission based at Bunde in the Federal Republic.

BRIXMIS, as the liaison unit was now known, planned its operations in West Berlin in accordance with tasking directives issued by the MoD, HQ BAOR and HQ RAFG. Tours were launched across the Glienicke Bridge and started officially from the Mission House in Potsdam, an historic town surrounded by water and full of faded glory and collapsing buildings. Tours, with either a land or air emphasis, would then proceed to the locations of their briefed assignments in the DDR, which roughly equalled the area of England. In the early years, tours would be out for just one day. Later this was extended to two or three days, to include night and day observation, or even longer periods if required for a particular operation. This meant careful selection of overnight locations which were usually deep inside a pine forest, where the time from stopping the vehicle to being zipped up inside a one-man tent could be as little as two minutes!

The British Mission was larger than both its American and its French equivalents, with Tour Officers, NCOs, drivers and supporting staff. Of these, thirty-one held Soviet passes which permitted them to travel throughout the DDR, except for Permanent and Temporary



*The British Mission House in Potsdam.*

Restricted Areas (PRA and TRA). These constraints were honoured, but the rough and ready PRA boundaries, which had originally been drawn on a small-scale map, allowed a considerable degree of interpretation when expanded to the large-scale maps used by the Allied missions, earning them the *sobriquet* ‘French PRA’ in honour of our more *laissez-faire*-minded colleagues. This could be most useful in any follow-up dispute as to whether a tour had penetrated a PRA. Other unofficial ‘Mission Signs’ were not recognised in their own right and indeed, by their very presence, could confirm an area of likely interest to a touring crew.

Originally, BRIXMIS had been a tri-Service organisation with a Royal Navy or Royal Marine officer observing maritime affairs on the Baltic coast. Adjusted PRA around the Rostock coastal area eventually precluded this sort of activity, however, leading the Mission to concentrate on land and air matters.

Touring tactics evolved progressively to cater for the increasing sophistication of our intelligence-gathering equipment, including, for instance, night-vision goggles, audio/visual recording facilities and night photography, as well as standard day photography, the available spectrum of equipment extending to high-powered 1,000mm lens, all

of the cameras being motor-driven. The tasking of tours involved close co-operation between the Allied Missions and, in later years, the judicious use of cross-referencing between other intelligence collecting agencies. For the greater part of the Mission's four decades of operations, BRIXMIS was approximately two-thirds Army and one third Royal Air Force, with a brigadier as Chief of Mission and a group captain as Deputy Chief.

As the years went by, the intelligence operation overtook the original aim of liaison, but I have never subscribed to the popular notion that intelligence eventually became 100% of Mission activities, with liaison virtually nil. Certainly, from the British Mission's perspective, an 'arms-length' *rapport* developed between BRIXMIS and our immediate Soviet hosts, the Soviet External Relations Bureau (SERB). Indeed, keeping this dialogue alive, especially at Chief and Deputy Chief level, paid dividends when things became difficult, since it could help to resolve disputes with the Soviets before they escalated to CinC level. This encouraged a healthy mutual respect and created an unlikely bonding in a kind of 'league of gentlemen' atmosphere, involving open liaison on the one hand, while recognising 'honour amongst thieves' on the other. But we had a job of observation to do and we could do it by tactfully and tactically staying within the rules. This was acknowledged in a statement by General Koshevoi in 1969 when he was CinC of the Group of Soviet Forces in Germany (GSFG), and by subsequent Soviet CinCs, who said, in effect, 'Go ahead, but don't rub our noses in it!'

Nevertheless, relationships could change with dramatic speed. They varied considerably over the forty-four years as the intensity of the Cold War ebbed and flowed in the wake of political and military events ranging from the Berlin Airlift to the Soviet invasion of Afghanistan. Liaison could take several forms. It could mean, for instance, acquiring from the BMH a drug which was otherwise unobtainable by the Soviets. This would help us, as well as being a humanitarian gesture. On behalf of the CinCs, an interchange of gifts at Christmas gradually became an established practice and in the final years, Anglo/Soviet dinners were held at the Minsk Hotel in Potsdam. National anniversaries were respected and honoured on both sides, sometimes with Headquarters' representation. Such occasions could

themselves yield useful intelligence, and the chain of command was fully briefed, both before and after all of these events.

In 1983, a Soviet fighter shot down a Korean Boeing 747 which had strayed off course in the Soviet Far East. Immediate constraints of a political, rather than military, nature were imposed on BRIXMIS' liaison activities in an attempt to indicate displeasure. A proposed reduction in the BRIXMIS whisky gift to SERB officers was given the 'Nelson' touch by the British Mission, who face-to-face with the Soviets, argued that the worse the situation, the greater the need to keep the conduits of dialogue open. On another occasion in my time, a Soviet naval officer wished to see the Plötzensee prison in the Western Zone of Berlin. He was the son of a Soviet officer who had been executed by the Third Reich. I can still feel the extraordinary numbing chill on escorting him into the prison museum and seeing a copy of the *Führer's* cordial formal invitation to guests to witness the execution, with refreshments to follow. BRIXMIS was the only possible mechanism for arranging such a liaison visit and, despite the poignancy of the occasion, it was much appreciated by SERB, as well as by the officer himself. This sort of thing helped to keep our current account with the Soviets well in credit, ready for future 'cashing' on a rainy day.

Although not integrated at the beginning, the level of 'jointery' between the Army and the RAF increased markedly over the years. Techniques were developed that enabled Army officers and NCOs to undertake air tours to airfields and air-to-ground firing ranges, while RAF crews could identify and comment on the tactics of the Soviet's 3rd Shock Army and on the conduct of *Spetznaz*, that is SAS-style, operations, if they saw any, which they frequently did. Crews were trained to be joint ground/air operators, and this was important as they were the only Allied observers on the spot and their views were valuable. This had not always been the case, but there is no doubt that the Mission did become a finely honed instrument for intelligence gathering.

No matter how sophisticated satellite systems and signals interception might be, the man in the field occupies a unique niche within the intelligence gathering community. There is no other way of viewing and recording the ordnance stowed *beneath* an aircraft, be it missiles, bombs, ECM pods or aerial arrays, other than by a man and

his camera looking upwards, these technical observations being amplified by informed comment on any associated tactics.

Radar and communications sites were routinely checked and re-checked from the ground to establish aerial alignment, rate of rotation and other data. A general shot of a radar installation could well be followed by a plea from MoD's Tech Int Air staffs for us to get closer and produce stereographic pictures of the radar feed-horn. Such challenges were relished, but our ability to meet them depended on many variables, including photographic conditions, the orientation of the sun, the proximity of PRA and, of course, the presence of Soviet or East German guards.

It was sometimes possible to obtain samples of runway surfaces and sub-soils, along with estimates of runway length and bearing, both from main bases and from deployment airfields. On occasions, we were able to observe the closure of a length of *Autobahn* and its subsequent preparation to support air operations, this procedure involving the summary diversion of civilian traffic away from the area.

Having thirty-one Soviet pass-holders on strength, BRIXMIS enjoyed the advantage of being able to allocate as many as three men to a tour, which was not practicable for the American or French operations. As its intelligence gathering activities increased, the unit evolved a flexible team usually comprising a corporal driver, a SNCO, who would be an expert in identifying and recording Soviet and East German weapon systems, vehicles, radars, aerial sites, fixed- and rotary-wing aircraft, and a Tour Officer. The latter would often be a linguist, and usually the cameraman, as well as being the officer in charge of the expedition, which made him, in effect, the CinC's representative. When the officer and NCO slipped out of the car to creep up on their objective, the driver was their back-stop and look-out. The French and Americans, with a two-man crew, were limited in the risks they could take, although some French teams took them anyway. Soviet helicopter crews were adept in locating mission cars and often ready to give chase, sometimes descending so alarmingly as to threaten to collide with the tour car.

Risk-taking was not encouraged, however. A sensible evaluation of the balance of 'risk versus gain' was the essence of the operation, our motto being that 'there will always be another day'. By its very nature,



*'Soviet helicopter crews were adept in locating mission cars and often ready to give chase, sometimes descending so alarmingly as to threaten to collide with the tour car.'*

there was bound to be a built-in risk element in touring within the hostile environment of the DDR. The majority of tours proceeded as briefed with little hassle from the Soviets, although the surveillance network of the *Stasi*, the East German *Volkspolizei* and their, so-called, 'narks' was a ubiquitous and disruptive force. Occasionally a tour would be 'detained' by being blocked on a road, driven off it in a staged accident or even ambushed. Accusations might be made, alleging illegal activity and the mission crew escorted to the local *Kommandatura* for interrogation. Any accusations would be denied, cameras hidden and exposed film rendered blank. A great deal of time would be wasted, but the detention would usually end cordially enough, sometimes in toasting the exploits of Manchester United and the Moscow Dynamos over a glass of vodka.

There were cases of Tour Officers being declared *persona non grata*, usually for some misdemeanour, imagined or real. This action could be taken by either side, but it was not done lightly, as it risked a reciprocal declaration and consequent elaborate and time-consuming



bureaucratic procedures. Occasionally things would turn distinctly nasty, no one being completely immune. In 1982 the Chief's shiny black staff car, with its Union Flag proudly displayed on the bonnet, was deliberately rammed in a carefully planned 'accident' which forced the car up against a tree; fortunately without serious injury to the occupants. The worst occasions were a cold-bloodedly executed collision between an East German URAL-375 heavy truck and a French Mission car in March 1984, which resulted in the death of *Adjutant-Chef* Marriott, and the fatal shooting a year later of Major 'Nick' Nicholson of the USMLM by a young Soviet conscript while the American tour was investigating a T-64 tank in a hangar. These dreadful events represented the nadir of relations with our Soviet hosts and had profound implications for all of the Allied Missions during their final six years of operations.

But there was never any real likelihood of the Soviets attempting to put an end to the missions simply on the grounds that they were too successful at intelligence gathering. The missions were an integral element of the arrangements established in 1945 to govern the Four-Power occupation of Germany following her defeat in the 'Great Patriotic War'. As such they represented part of the post-war *status quo* and the Soviets well understood the logic of not changing anything, lest the whole business should unravel. It is also arguable that the Soviets may actually have wanted the Western Missions to be able to observe their combat readiness at close quarters in order to demonstrate the Warsaw Pact's deterrent capabilities. Furthermore, the presence in the West of SOXMIS, and its associated freedom of movement (much greater than that permitted to embassy staffs), was far too valuable as an agent-support mechanism for the Soviets to risk losing it.

If, after evaluation, a risk was considered to be worthwhile it would be taken, either on the initiative of the Tour Officer himself or as directed by higher authority. This might involve, for instance, entering a Soviet emergency deployment bunker, perhaps revealing NBC filters and appointment titles on the walls, or ramming an apple up the barrel of a tank machine gun to establish the bore of the weapon. The Tour Officer would later have to justify his actions, however, and audacity was always tempered with caution. The Eleventh Commandment, 'Don't get caught!', has never been more

apposite. A specific risky operation, personally authorised by the Chief, was Operation TAMARISK. This involved rummaging in Soviet hospital dumps for dressings, log books and other discarded high-value documents standing in as toilet paper. After careful sifting back at base, the staffs would discard much of this material, but they could sometimes be rewarded by finding gems, like orders of battle or traces of metal from bullets which, after appropriate forensic investigation, perhaps employing gas chromatography techniques, could yield useful technical intelligence.

To take account of the wider political situation, one operation was authorised by the British Commandant in Berlin himself. This was the regular flying over greater Berlin, including the Soviet Sector, by Chipmunks based at RAF Gatow. Under a long standing agreement, the Allies enjoyed flying rights over and around the city within a 20 mile radius, this being justified on the grounds that pilots needed to maintain flying currency. The occupants of an aircraft at the legal limit could, of course, see even further afield. Within this area there



*An Army Tour NCO (Sgt Wike) using an apple to assess the calibre of the machine-gun fitted to the new BMP-2 armoured vehicle; this one happened to be on a railway flat car at the time.*

was an abundance of Soviet installations, training areas, headquarters, engineering depots, missile sites and so on. An observer, armed with a powerful camera and a cast-iron stomach, was presented with ample opportunities to photograph all manner of weapon-systems, including, for instance, tanks undergoing maintenance with their guns and turrets removed, thus revealing a wealth of internal detail.

The Soviets were clearly aware of the presence of the Chipmunks and were not disinclined to aim the occasional shot at the aircraft. The importance of the operation meant that a pilot and observer were assigned to the Mission in the later years and a very high proportion of the British Army's technical intelligence 'take' has rightly been attributed to this single operation. A morning flight around Berlin was also a useful way of discovering convoys or troop movements. These findings would be debriefed before the daily BRIXMIS Army tour of the local area set off. This sort of exploitation of the available resources to mutual benefit, is an excellent example of the close RAF/Army co-operation that developed, making BRIXMIS a seamlessly 'purple' organisation.

It is worth stressing that even 'negative' intelligence could be valuable, where, for instance, a touring crew might have seen nothing more than a routine Soviet staff car. After each tour had returned to West Berlin, an immediate debrief of highlights was sent to Rheindahlen to update current Warnings and Indicators. A more comprehensive report with photographs and comment would follow later. The three Allied Missions co-operated and arranged air and ground tours in a sequenced pattern around the DDR. It was our objective to have a BRIXMIS Tour on DDR soil every day of the year.

BRIXMIS' contribution to British and Allied intelligence gathering during the Cold War was immense and it was a privilege to serve with this unique organisation. My colleagues will now continue the story and go into greater depth to cover the development of techniques from their own experiences with the Mission, from the 1950s to the 1980s.

**Acknowledgement:**

*Beyond the Frontline* by Tony Geraghty, Harper Collins.

## RAF ELEMENT, BRIXMIS, 1956-59

### ORGANISATION AND OPERATIONS

#### Group Captain Hans Neubroch



*Originally trained as one of the last observers, Hans Neubroch was commissioned as a navigator in 1943. Initially retained in Canada as an instructor, he was serving with Bomber Command at the end of the war. Three years later he qualified as a pilot. Following the 1956 Staff College course he was posted to Berlin. He subsequently commanded No 35 Sqn (Canberras) and later RAF Wattisham (Lightnings). Following staff tours with HQ 11 Gp and HQ SEATO, he ended his career as Chief, Arms Control at SHAPE. In retirement he became a director of Control Risks. He was a founder member of the RAF Historical Society and its very first Secretary.*

#### **Background**

In 1956, a reorganisation of the Mission resulted in the upgrading of the post of Senior RAF Officer to that of Deputy Chief, in the rank of group captain in the GD (Flying) Branch. Previously, the senior RAF officer had been a wing commander of the Secretarial Branch, which included intelligence specialists. To fill the post, the Head of Air Force Intelligence, AVM W M L MacDonald, selected Gp Capt F G Foot, who had recently completed an unusually successful tour as British Air Attaché in Hungary.

George Foot, a Canadian from Winnipeg, had paid his own fare to England to join the RAF in 1937. He had a distinguished war as a flying boat captain and, as a navigation specialist, was entrusted with two missions to Murmansk shortly after the German invasion of Russia. After the war he was selected for Russian language training at London University, topped off by several months living with a Russian *émigré* family in Paris. His appointment to Budapest followed. A year after leaving Budapest, his arrival at BRIXMIS brought about a transformation in the way in which the RAF Element conducted its business. Foot was determined that, as long as he had anything to do with it, every RAF tour would be planned, briefed,

conducted and evaluated with the same meticulous professionalism as an operational flying mission.

Foot's brief from MacDonald was to gain intelligence on the 24th Air Army (24 AA) and, to a lesser extent, since its inventory was generally less advanced, the East German Air Force (EGAF). MacDonald emphasised that Foot's first priority was to provide technical intelligence; next in importance, he was to comment on the capability of 24 AA; lowest priority was updating the Soviet/EGAF air order of battle.

The control and reporting chain ran directly from the Air Ministry's Technical Intelligence Branch (DDI Tech) to the RAF Element of BRIXMIS, with the Ministry's air ORBAT specialists (DDI 3) and the Intelligence Branch at HQ RAF Germany receiving copies of all reports. We were never *ordered* to obtain specific intelligence, but there was a 'wish list', allocating degrees of priority to a variety of objectives. Routine touring to update the ORBAT and to gain technical intelligence was modified in the light of the wish list, but it was entirely up to the RAF Element to decide if and when a particular target was approachable.

### **Foot's Operating Methods**

In the early 1950s Touring Officers had made pencil sketches of their objectives, but Foot insisted that henceforth photography was to be the primary means of validating intelligence. No item was credited unless there was photography to support it. He obtained the necessary high-grade equipment and developed appropriate techniques; details are shown in Table 1.

Technical Intelligence required detailed photography of combat aircraft and radar sites, with emphasis on their electronic fit. For aircraft, in an era of, as yet, unsuppressed aerials, this meant large scale cover of their undersides. Such high grade photographs could best be obtained from carefully reconnoitred Observation Points (OP) some 3kms from either end of an operational runway, where aircraft taking off or landing would be at about 700 ft. Sqn Ldr Harry Nunwick, our electronics specialist, concentrated on radar sites and produced high grade and detailed photographs of a variety of radars.

24 AA's and the EGAF's orders of battle were monitored by routine monthly cover of accessible Soviet and EGAF airfields,

### **Equipment**

1. Camera. Leica M3, 400mm Telyt lens for use on land, 200mm from the air.
2. Visual Observation. Zeiss Deltrintem 10× and 15× binoculars; 500 mm monocular (all bought in the DDR for East Marks).

### **Method**

3. Aircraft on the Ground. Flight-line: stereo technique whenever possible.
4. Aircraft in Flight. In a trial Foot exposed dozens of films and determined that for best results it was necessary, on a clear day, to take light meter readings against the horizon and then overexpose by two stops, always using a filter. By special developing techniques he enhanced the resulting exposures, raising 64 ASA Panatomic-X film to the equivalent of 1600 ASA, with excellent definition and contrast.

N.B. The RAF provided a corporal photographer for the use of the entire Mission.

### *Table I - Photography - Technical Details*

concentrating on the flight line and radars, from suitable OPs or, more commonly, from adjacent roads, standing on the touring car's roof if the usual wooden perimeter fence obstructed the view from lower down. Since time and opportunity were at a premium, Foot's golden rule was, "*Photography first, visual observation if there's time.*" An instance when this rule paid off handsomely in terms of technical intelligence arose in the summer of 1957, when Foot and I, after a routine visit to an airfield, returned with a photographic panorama of the flight-line of Fresco and Flashlight fighters. When Foot checked photographs of the Flashlight area he realised that one aircraft had its nose-cone removed, revealing the AI radar dish. This photograph provided technical details which had long been sought by allied intelligence.

The Gatow Chipmunk routinely provided useful ground order of battle intelligence, but its usefulness was by no means confined to the Army Element. In July 1959 it more than paid its due to air intelligence, when Harry Nunwick became aware that the Soviets had



*One of a succession of Chipmunks which were based at Gatow to exercise the British right to fly anywhere within the Berlin Air Safety Zone which, in the process, provided BRIXMIS with a very useful reconnaissance platform.*

established their first SA-2 site outside the Soviet Union at a former *Luftwaffe* air defence mound at Glau, some 20 miles south of Berlin - just outside the Berlin Air Safety Zone. The Guideline missile had been photographed at the recent May Day parade in Moscow, but nothing was known about its associated radar. Harry had paid several visits to Glau but had been unable to penetrate the perimeter fence either in person or photographically. An air sortie was indicated.

On 16th July the two of us set out from Gatow, flying the routine clockwise circuit. Just short of Glau I dived to 300 ft and positioned Harry, by means of some fairly tight turns, for his photography. We hurried back to Gatow and thence to the Olympic Stadium to have the films developed. They clearly showed the technical details Harry was after. Next day we flew the prints to HQ RAF Germany where we had to show them to the CinC. We were later told that they were on President Eisenhower's desk the following Monday.

On the value of the Chipmunk, I should mention the fact that on the morning the Berlin Wall went up in August 1961 my successor in post, Sqn Ldr Dickie Dyer, obtained the first pictures identifying the Soviet and East German forces involved.

### **Overcoming the Opposition**

It goes without saying that our efforts to collect intelligence aroused considerable opposition. Most mornings, cars, manned by East German *Stasi* officers, known to us as 'narks', would be stationed near the exits from Potsdam. They were EMWs - an old BMW design produced in East Germany - or ancient Mercedes. Their registration numbers were known to us, as were the faces of most of their occupants. They pretended to be ordinary civilians and, when confronted, they would claim that their proximity to a Mission car was purely coincidental. Normally they would follow at a discreet distance - as far as two kilometres on the *Autobahn* - and warn military personnel of our approach, once they thought they had identified our objective. If they had a choice of quarries, they would always follow the Mission car that they had seen first. They were procedure-bound, and not the brightest. As against that, our RAF drivers were of the highest quality and could be relied upon to see off the opposition with a nice blend of panache and care for their cargo. Cpl (later WO) Jeff Smith got his BEM while serving with the Mission.

Foot's singular insight, which in retrospect seems obvious but nevertheless was much contested at the time, recognised that we could not do our work while under observation from the opposition, be they *Stasi* narks or military personnel guarding our objectives. Henceforth, RAF tours were to avoid or shake the narks, and never compromise the security of an OP. If we failed to gain the approach to our OP unobserved, the planned tour was abandoned for some less sensitive activity, such as picnicking in the woods or talking to the locals to assess their attitude to the regime, which went under the euphemism of 'gaining political intelligence'. These were times when we had to curb our natural enthusiasm to get the primary job done. George taught us something just as important, '*Don't stir up the opposition; there's always another day.*' But even an apparently unproductive day, in terms of intelligence gained, was never entirely wasted. We would explore unmarked trails in the woods against the day when we might use them to outfox anyone following us. Not that we often aborted a tour; in my two-and-a-half year's touring I failed only three times to shake a nark.

We used four tactics, singly or in sequence. If there was a nark sitting at the Potsdam exit you had chosen that day - and this wasn't always the case - he would start up shortly after you had passed him



and follow at a discreet distance. Since we knew his likely location and the appearance of his car, we made it our business to spot him first. This would give our driver a chance to accelerate away. If the nark then lost visual contact before we reached an intersection, we could turn off, greatly reducing his chances of choosing the correct turning. A further intersection would reduce his chances even further. We did, of course, make it our business to know all the local cross-roads.

If the first tactic failed, we would take the nark to the nearest *Autobahn*, where we would cruise gently along at about 50 mph, the nark following well behind. Some half a mile before reaching a known lengthy incline our driver would accelerate dramatically. The nark would not realise this for the few vital seconds it would take him to gain the incline, and then it would be too late. Even if he put his foot down hard, the clapped-out East German car with its low grade petrol would be no match for the immaculately maintained Opel *Kapitan* with its high octane western fuel. We would lose sight of the nark long before turning off at one of the *Autobahn* exits, a repeat of the cross-roads tactic. He had *no* chance.

An alternative *Autobahn* tactic was based on our lay-by survey, from which we had selected a number having two features in common. These lay-bys were not overlooked from the *Autobahn*, and they had an alternative exit into the countryside, if only along a rough field track. We would enter such a lay-by, ostensibly to have our mid-morning cup of tea or mid-day picnic. The narks would sit near the exit to the lay-by, perhaps enjoying their own picnic, waiting for the *Englander* to emerge. You can imagine the rest of the story.

There was another tactic which we used only rarely, and with discretion. One instance was in December 1958 when Gp Capt John Boardman (George Foot's successor) and I spent a night with our wives at the Potsdam Mission house. Next morning one car, containing the ladies, *en route* to Leipzig, picked up the guard nark at one of the Potsdam exits. John and I followed five minutes later along the same route and had a clear run. The ladies spent the day shopping in Leipzig, leading the narks a merry dance on the escalators of the local *Konsum* department store. John and I did our day's work, and we all rendezvoused at a half-decent hotel, the RAF party spending the night in comfort while the narks froze in their car. Next morning, the

ladies departed first, again attended by the narks, for the return journey to West Berlin. John and I set off on another day's unobserved work.

### **Tour Patterns**

We would normally plan to spend an entire Tuesday or Thursday - 24 AA rarely flew on other days - photographing aircraft of one particular regiment, reverting to ORBAT tours only if there was no flying. To maintain the security of OPs, we would not attempt to assess both capability and ORBAT at the same airfield on the same day. Each tour team normally consisted of a driver and two of the three officers who were qualified interpreters; Nunwick preferred to tour with just a driver. Each tour required detailed planning and briefing, as though for an operational flying sortie. Each tour member had to be aware of the objects of the exercise and familiar with the proposed route, as well the location of, access to and exits from OPs. One officer, designated tour navigator, would, irrespective of rank, be in tactical command during the transits to and from the target; the other would keep a constant look-out for followers, with the object of 'seeing them first'. To maintain security of OPs, maps were never marked; significant geographic details had to be memorised.

Targets were selected in the DDR quadrant agreed with the American and French Missions and rotated regularly every week. The quadrant agreement provided for operating outside the national quadrant only after giving prior notice to, and gaining the permission of, the other Missions. This system was set up by George Foot; the RAF Element observed it scrupulously, although the Americans and French occasionally treated it in a rather cavalier fashion. A weekly exchange of reports and photographs with the Americans and French ensured optimum exploitation of the output of the three Missions.

Joint army/air tours were rare, but anything of army (and indeed political) interest would be fully reported. During one period in 1959 Hew Madoc-Jones was particularly successful in reporting the detailed composition of Soviet Army convoys. Intelligence of this nature was a valuable bonus from an RAF tour. Now, if the way I've put that sounds a little lacking in 'jointery', we should perhaps remind ourselves that at that time the upper reaches of the UK's defence organisation was hardly joint itself. In our case, we worked, in the first

instance, for the Air Ministry, and secondly, for the CinC RAF Germany. Our aim was to despatch written reports, together with photographs, to our two masters, usually within 24 hours of the completion of a tour.

### **Achievements and Failures**

I wish I had the time to round out this account with examples of tours, successful and unsuccessful. For instance: how we maintained continuous observation, for five days and four nights, of one particular airfield to validate our understanding of the Soviet flying pattern, as against that held by RAF Germany; how we photographed and surveyed the interior of a new Soviet air defence bunker just before it was commissioned; and our first-hand account of the 1958 Potsdam riots which led to the Mission abandoning the vandalised *Wildpark* compound and moving to the splendid villa on *Seestrasse*. On this latter occasion, incidentally, our then Chief, Brigadier Miles Fitzalan-Howard, displayed characteristic, if somewhat idiosyncratic, qualities of leadership. He is now, of course, HG The Duke of Norfolk. I shall cover some of this in a further paper I intend to submit for possible publication in *The Journal*. (See page 105, Ed).

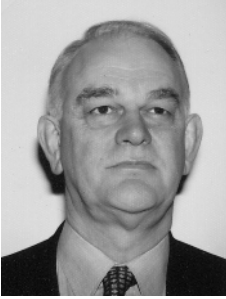
Let me leave you with a list (Table 2), which is not necessarily exhaustive, of at least some of the achievements of the RAF Element during the three years 1957 to 1959. For me, those were among the most fascinating, productive and rewarding years of my Service career.

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| <ol style="list-style-type: none"> <li>1. Detailed photography of Fresco C and D, and Flashlight A and D.</li> <li>2. First detailed photographs of Beagle in ECM fit.</li> <li>3. First sighting of EGAF Beagles, the first German bombers since WW II.</li> <li>4. Early or first sightings and detailed photographs of Farmer A - E.</li> <li>5. First sighting and detailed photos of the BB-152 (an East German civil transport jet designed by a Junkers team) minutes before it crashed.</li> <li>6. Detailed (underside) photographs of individual Soviet front line aircraft, amounting to some 85% of 24 AA's strength.</li> </ol> |
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*Table 2 - Achievements 1957-59*

## **BRIXMIS - OPERATIONAL PLANNING AND TOURING IN THE 1970s AND 1980s**

### **Group Captain S A Wrigley**



*Steve Wrigley graduated as a pilot from the RAF College in 1966 and flew the Hercules with No 48 Sqn at Changi and with Nos 24 and 47 Sqns at Lyneham. From 1973 to 1975 he was an exchange officer on the Transall C-160 at GAF Landsberg. While serving with BRIXMIS in 1979-82, he flew the Chipmunk from Gatow. In his later appointments he was Defence Attaché in Oslo and Air Attaché in both Rome and Bonn.*

*He is a qualified interpreter in French, German and Norwegian and holds qualifications in Italian. He now works for the British Consultants Bureau in London.*

I have been asked to talk about touring and operational planning in the late 1970s and early 1980s. You have already heard quite a bit about the general nature of touring and what we did. I will now try to give you a flavour of the detail that went into the BRIXMIS operation. What struck me when I read Tony Geraghty's account of BRIXMIS, in his *Beyond the Front Line*, was how much the nature of touring appeared to have changed - evolved is perhaps a better word - since the early days when people were essentially feeling their way. I think that the work they did, and the precedents that that experience established, laid the foundations for the well-oiled and highly operational unit that BRIXMIS had become by the time I joined it in May 1979. I will confine my remarks to 'air' touring initially, that is to say, a ground tour in the DDR undertaken by RAF Tour Officers against air ORBAT targets. The term 'air' touring does not, in this context, have anything to do with the Chipmunk.

It is important to appreciate the intensity of our operations. We worked incredibly hard, literally 'beyond the front line' because, although circumstances demanded it, we all, without any notable exception that I can recall, liked it tremendously. It could be boring and tedious; it could be exciting and challenging. It could certainly be rewarding; the sense of satisfaction at obtaining a 'scoop' was almost

tangible. Then again, there was always the surprise factor; you never really knew what would happen next. In other words there was often an adrenaline ‘rush’ which, for most of us, was not a little addictive.

The routine for an air tour crew, whose targets might cover airfields, aircraft, weapons ranges, radar units, communications systems and certain missile sites, would be as follows: start work with a compulsory daily recognition training session; plan for the next tour and complete tour reports for the rest of the day; leave Berlin at about 2000 hrs to spend one or two days in the DDR, usually returning towards supper time on the second day; start the cycle again almost immediately on the following day. Although we planned to sleep in the DDR, that was not always possible, or indeed restful.

Once back in Berlin, the aircrew would almost certainly have had to fit in a day completing a Chipmunk task with all of its attendant preparation and report compilation before going out on the ground again. It was this work load that led Gp Capt Peter Botterill, the then Deputy Chief, to establish a dedicated Chipmunk crew to carry out the flying task, thus relieving the people who did the ground ‘air’ tours. The main concern had been flight safety, in that he feared that the fatigue factor might lead to an accident. That it had not done so already was a tribute to the professionalism of those chosen for the appointment and, perhaps, not a little luck.

### **The Process**

Perhaps the best analogy I can offer to describe BRIXMIS tour planning is to liken it to the flight planning process. The basis of all planning was the agreed division of the DDR by the three Allied Missions into four areas. Area A was the North, B the South East, C the South West and there was the so-called Local Area around Potsdam. Only two missions were able to deploy in each area at a time; BRIXMIS Air might, for example, be combined with, say, USMLM Ground. The missions would rotate through the areas in a clockwise direction about every three weeks. Liaison was effected principally by a weekly, or more frequently if necessary, meeting of the different missions’ Ops Officers. The system worked well.

BRIXMIS had two Ops Officers, one an Army major the other an RAF squadron leader. Whereas the major was posted in as an Ops Officer who toured from time to time, the squadron leader toured for

about twenty months before becoming an Ops Officer for the remainder of his time. Though he might still do the occasional tour, his time in the field was severely curtailed, much to his chagrin, since his functions were now to provide continuity and stability and to use his expertise to control the RAF operation. The Ops Officers received their tasking via close liaison with the various desks within MoD's Department of Scientific and Technical Intelligence who aimed to meet the general intelligence collection requirements laid down by Chief of Defence Intelligence on, if memory serves, an annual basis. Occasionally desk officers from MoD would visit Berlin to update us on subjects of particular importance or urgency.

To this broad tasking base, the Ops Officer would contribute his own experience and knowledge of Soviet and East German flying programmes, cycles of operational activity, reports from the other missions and inputs from the weekly tri-mission Ops Officers meeting. Rarely, if ever, in my time did we knowingly receive tasking as a direct result of SIGINT; this caused much frustration, but we were told that it was to avoid compromising the capabilities of the facilities concerned. Nevertheless, there were occasions when intelligence received at short notice indicated a change in plan. Unfortunately, because our tours did not have radio contact with base, it was well nigh impossible to effect a rendezvous, unless it had been pre-arranged, and it would have been unwise to broadcast the necessary information anyway. When a rapid response was called for, therefore, it made more sense to lay on an extra tour.

Supplementing the known collection requirements with his knowledge and experience, the Ops Officer would define a set of specific targets for a tour. He would consider when a site was last visited; he would take into account the priority for certain information about particular aircraft or equipment; he would review the sensitivity of a site. Had the OPs been compromised recently? Had *Vopos* or narks been seen there? Had any incidents taken place in the area? And so on. Naturally, this covered operations and incidents involving the other missions. Information about what happened to the tours undertaken by the French and the Americans was distributed to all via the post-tour report, which was filed on return in the USMLM whence it was distributed to the other two missions and covered at the weekly tri-ops meeting.

A tour programme might take in two air bases as main targets plus a deployment airfield and, possibly, an air-to-ground range. Some of my best memories are of observing Hind helicopters at low level attacking targets on the ranges. They were a really aggressive flying fraternity! If the BRIXMIS crew were bounced off their main target, or if there was no flying, the tour brief would also include a number of ground installations such as radar and SA-2 sites, comms aerials and aerial farms and similar static targets. Where possible, the Ops Officer would try to achieve a balance of different targets to take advantage of the different levels of expertise within the team. It was only to be expected, of course, that some Tour Officers would be strong on, say, aircraft targets while others would excel at detailed photography of ground installations. These factors would be at the back of his mind when drawing up the tour programme.

Having decided the objectives of the exercise, a process which may have been influenced by some background intelligence that could not be shared with the crew, the Tasking Order would be passed to the Tour Officer and NCO who would then draw up their 'flight plan'. How and when they tackled each specific target was largely up to them and could, of course, be dictated by conditions on the ground. In general, though, an air tour would leave in the evening to reach an area where they could safely lay up until first light, or the start of the local flying programme, and then move from their overnight location to an OP without being spotted. Routes were plotted from target to target by the Tour NCO with the aid of a 1:50,000 wall map, which ran along the entire BRIXMIS corridor in the Field Force HQ, taking into account the Permanent Restricted Areas (PRAs) and any notified Temporary Restricted Areas (TRAs). These were strictly observed. He would navigate to the target area where the Tour Officer would take over, as navigation was his responsibility close in to the target. Needless to say, the NCO still backed him up, although his main purpose at that stage was to be alert for sentries and to monitor, observe and record his observations. The process can be likened to the navigator taking you to an Initial Point, and the pilot taking over from there to the target.

Flexibility was, as ever, the key. On the way to its overnight location, for example, a tour might run into a regiment or larger formation deploying, or 'crashing out', for an exercise. A decision

would have to be made as to whether to find a place to observe or whether to leave it because another mission's tour was likely to be onto it in any case. We never intentionally poached or got in each other's way and, as I explained earlier, the way in which tours from the different missions were scheduled, meant that a BRIXMIS air tour was never in the same sector as a BRIXMIS ground tour.

But, back to the planning process. While the Tour NCO was planning the route, checking his sound recording equipment and sorting out his sleeping gear and rations, the Tour Officer would be considering how best to approach the target, which OPs he would use and considering the availability of escape routes. Pooling their experience in order to achieve the aim, the NCO and officer would often do this detailed planning together, especially if one of them had previously been to a site which the other had never seen; for an individual his first visit could often set the standard for all of his subsequent visits.

In the meantime, the tour driver, whose specific responsibility was the car and its equipment, would be advised of the basic plan, not only because he had a right to know what was expected of him in driving terms, but also because he might have good, practical experience of some of the targets that would be of use in planning the tour. The driver might be RAF or Army, the jointery being such that it mattered not to which Service a driver belonged. They covered all types of touring and were a great source of experience and advice.

To evaluate the approach to each target we kept detailed records of the location, manning, equipment and sensitivity of the site as well as updated maps of the area. The target maps were a series made after the war from captured German plates of a survey commissioned by Hitler, in about 1936 if my memory serves me correctly. They were still remarkably accurate in the 1970s and 80s; even the tracks through the forests were much the same as they had been when the survey was undertaken. Although we took accurate and detailed maps into the field with us, we did not take anything that showed detailed target information.

Having translated their directive, which had merely stated the targets to be covered, into a logical and detailed tour plan, the crew would report to the Ops Officer for any final briefing before going home for an hour or two's relaxation before departure. For most of us



this was a brief time with the family before an absence of 48 hours in the DDR. I hope by now that many of you can see why I regard this process as very much akin to flight planning.

I have dwelt at some length on the planning process. In discussing BRIXMIS you may well have heard some of the war stories. What tends to be downplayed in most war stories, however, is the background, the planning and the professionalism of the team in their approach to the job. The action part is much more interesting, of course, but I am quite convinced that BRIXMIS' many successes in this period owed much to the painstaking creation of an accurate database of targets and maps, on which sound planning could be based, and to the dedicated and professional attitude that was fostered within the Mission. As Hans Neubroch has said, it was realised early on that it was far better to abort an attempt on a target, so that we could return safely another day, than to sensitise it unnecessarily for people who would come after. Often regarded by our friends and contemporaries in other units as 'cowboys', creating mayhem in the DDR, they would have been surprised to learn how far from the truth that image was.

### **The Tour**

For a typical air tour the Tour Officer would carry two camera bodies, one with a motor drive, a 1000mm lens, a 500mm lens, a 180mm lens and a smaller normal camera lens. He would also have a pocket camera and tape recorder, torches and binoculars. Night-sights and video cameras were creeping in towards the end of my time on the mission. His touring kit would be green fatigues, flying boots, an arctic sleeping bag, perhaps a safari bed and a poncho fitted with elastic luggage ties that could be hooked easily to two suitable conifers to provide a roof. I have never slept as well as I did in the open in the DDR, winter or summer!

Typically an air tour left Berlin via the Glienicke Bridge at about 2030hrs. Although our passes were always checked on entry and exit by the Soviets, it was part of the agreement that our vehicles were not searched. They were, however, closely inspected for condition so that a comparison could be made on our return. Dents and broken windows might be hard to explain if we had been involved in a serious incident or accident. Not that any of us would have left the scene of an accident



*Of the several thousand British personnel stationed in West Berlin, only the handful who were accredited to BRIXMIS were able to travel to and from the city via the Glienicer Brücke, which also served as a convenient venue for the exchange of spies and other occasional diplomatic events.*

unless the situation had turned very ugly. We would then check into the Mission House, collect last minute chocolates and Cokes, and, if a returning crew was passing through, we would go into the garden for a brief chat about anything of interest. We would then depart, watched by the permanent *Vopo* on duty in the street outside. Various junctions were observed by the police so that our progress could be monitored and, presumably, a guess made as to our general intended direction.

By now night would have fallen and the game was most definitely 'on'. The cars could modify the light set up in order to appear like a motor bike and, on moonlit nights, it was quite possible to drive without lights. So, depending on just how far away our intended destination was, the aim was to throw a false scent at an appropriate stage in the journey. You might wonder why we were not trailed continuously once in the DDR. Apart from not being in the spirit of the agreement, I was once told by a colleague who should know about these things, that it takes something like a dozen units to ensure continuous covert surveillance of a mobile target. Given that there

were seven tours out in the DDR at any one time every day of the year, if that were true, the resources required to monitor tours all the time would have been tremendous. And, in the grand scale of things, there were probably other operations of greater importance for them to keep an eye on.

There was generally not much traffic in the DDR in those days and very little at night. The tour would keep a look out for traffic regulators, soldiers who had been left to indicate the desired direction for military convoys at junctions, just in case a unit was crashing out for an exercise, but our main aim was to reach, hopefully untracked, a safe, wooded area near our intended OP at the first airfield where we hoped to observe the next day's flying programme. Arrival at the overnight location, or '*Z Platz*', would be between midnight to one o'clock. Then, if certain that all was okay, the Tour Officer and NCO would set up their sleeping gear outside the car. The driver, however, always slept inside the locked vehicle. That way, even if surprised, the car and our cameras were secure. An act of violence would therefore have been required to break in and this would have contravened the spirit of the Robertson-Malinin Agreement. Actually the tour driver had a raw deal, as it could often be colder and more uncomfortable inside the vehicle than out.

At first light we would be up and waiting for the sound of aircraft starting up. Almost invariably a weather ship went up first, so it was important not to move to the OP too soon; the longer you were there, the more likely you were to compromise it. Ideally, an OP to the south of the approach line to the runway in use was the best area for photography, ie with the sun behind the camera and on the aircraft. A knowledge of the likely Met conditions for the day also influenced the selection of the locations for both the overnight '*Z Platz*' and the OP. The availability of suitable OPs in the approach area could be limited and, if they were known to the 'narks', as we called the members of the East German Security Services, the *Staatssicherheitsdienst* or *Stasi*, and they knew that we were in the area they were likely to be out looking for us and checking known locations.

I used to think that touring was rather like fly-fishing. You know the water and where the fish are likely to be; you have the right tackle, but you still have to approach the fish without its being aware of your presence. If you get yourself into the right position then, with skill,



*An OP in the woods.*

you can catch fish until you do something that scares them off. So it was with observing a flying programme. We knew our way around off the roads better than most Soviets and East Germans; we knew a great deal about the targets and the surrounding areas; and we had good kit. We just had to get into position unobserved and then act discreetly. We compromised ourselves if we stayed too long, were too bold or became careless. The cars were not really camouflaged but they were a dull matt green. The Deputy's was blue, which was not as strange as it might seem, as it merged well into the shadow thrown by green foliage. Reflections from the glass of the vehicles' windows represented some risk but, because the sun was usually behind the observers, this was not normally a problem.

Despite our precautions, the pilots of the aircraft we were observing might spot us, especially if we were in a relatively exposed OP, as happened when I got some of the early photographs of Fencers. We stayed too long and nearly got caught by Soviet Special Forces. It was a close shave and we would never have got away if they had been more professional when they did finally try to surprise us. Having, quite unnoticed by us, skilfully got themselves into a good position from which to jump us, they charged the car, whooping like Red Indians, and went for the doors. As an automatic reaction the driver

had started the engine and, realising that the way forward was clear, both the NCO and I yelled, "Go!", and we did. If they had quietly walked the last few paces and stopped in front and behind the car there would have been nothing we could have done. As it was, we just drove straight ahead through a field of maize about 5 or 6 feet high hoping that the radiator would not get blocked with foliage. The rule in an OP was that if any member of the crew began to feel uneasy, or thought he had seen something untoward, we left. With experience, one's gut feelings were usually correct, even if you could not provide a positive explanation for them.

There were many reasons for observing a flying programme. The 'bort number', that is the *Geschwader* (wing) number and colour on the nose of an aircraft, gave useful confirmation of ORBAT details. New bumps, aerials, dielectric patches and the like could indicate new equipment. The length of a flying programme, the weather conditions in which it was being flown and the days on which it was being executed all told us, and others, useful information about the operational capability and capacity of a particular unit. I, for example, always found it strange that we hardly ever saw any fast jets at low level in the DDR (and remember we were out every day ranging over large areas) unless it was on a range. I am still not sure that I know the reason for this. The DDR was too small to keep meaningful low level flying within PRAs and TRAs. In the UK, you are eventually bound to see a Tornado or a Hawk somewhere at low level. Did they do it all outside the DDR? Did they not train much at low-level? Did I just miss it?

SA-2 sites were probably the most difficult static targets. We were mainly after serial numbers from which a mass of useful information could be deduced by the experts. They were sensitive and well guarded places. Care, good planning and a bit of luck were required for these. They were best visited infrequently in order to lull the opposition into a false sense of security and thus achieve an element of surprise. Radar sites provided a good opportunity for some excellent photographic work on aerial feed details and the like. Comms aerials required patience and application to ensure the angles were noted correctly. Railways, usually covered by the Army, were monitored during coffee breaks and in the early evening of the second day if nothing else was going on and if it was too early to set off for

the next day's airfield target.

Of course, we did not always get away with things and from time to time tours were detained. Sometimes tours were set upon, quite aggressively, by both the Soviets and East Germans. Sometimes we were just plain unlucky and got bogged or stalled at the moment critique. As we never recognised the authority of the East Germans, the basic rule was to sit tight, maintain the security of the car and wait for the Russians to be called. It is often thought that all BRIXMIS personnel spoke Russian. Many did, of course, for liaison purposes, but in my view good German was far more useful on tour. It certainly got me out of a potentially embarrassing situation on the training area behind Zossen Wunsdorf, the HQ of GSFG, on one occasion and it could be useful to break the ice with the Germans until the Soviets arrived. I am sure that I am not the only tourer who, having been detained in a town, has successfully blamed the ensuing traffic jam on the stupid behaviour of the Soviet soldiery - much to the amusement and satisfaction of the gathering East German onlookers. Mind you, the *Kommandant* took a dim view of the proceedings! But he let us go as we had not, at the time of the detention, actually been doing anything 'illegal' and we had had a perfect right to drive along the road in question.

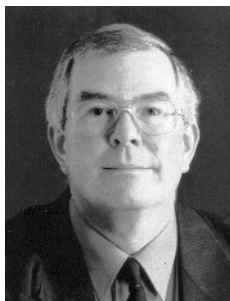
Most tourers would take a flask of hot food. It mattered not what it was, because it was almost invariably pooled in one pan and spiced up with generous quantities of curry powder. Many a wife has been surprised to learn, after a few months in Berlin, that once those special meals she had lovingly prepared for her husband reached the DDR, they simply became another curry.

Return procedure was the reverse of the outbound via the Mission House. An immediate post-tour 'Highlights Report' was left at the USMLM on the way back to HQ BRIXMIS. If we had obtained a 'scoop' or knew of something special going on, that too went into the report and the Ops Officers and others would be informed as appropriate. It was a golden rule of BRIXMIS that, once back in Berlin, normal duties and social responsibilities had to be honoured. It was not unknown for Tour Officers, and maybe the odd Chief, to drift off to sleep at a dinner table on return from a tour!

And then we would start all over again, just a little bit more experienced and, perhaps, a little bit wiser.

## BRIXMIS – THE VIEW FROM WHITEHALL

### John N L Morrison



*John Morrison joined the Defence Intelligence Staff (DIS) in 1967 as a desk analyst, subsequently filling a wide range of analytical and management posts. He spent three years as Director of Marketing Services in the MoD's Defence Export Services Organisation and was seconded twice to the Cabinet Office, latterly as Secretary to the Joint Intelligence Committee (JIC). He rounded out his DIS career with four years as its senior (2-star equivalent) civilian, the Deputy Chief of Defence Intelligence and Head of the Defence Intelligence Analysis Staff. As such he was a member of the JIC, UK representative to the NATO Intelligence Board and Head of Profession for the MoD Research Officer classes.*

I have been asked to round off this morning's session by assessing BRIXMIS from the viewpoint of the Whitehall user. The desk analysts in the Defence Intelligence Staff were the main British customers for BRIXMIS products and I shall concentrate, therefore, on the service it provided to them, but I will close with a few words on the value of BRIXMIS as seen from the wider perspectives of the British and Allied intelligence communities.

First, a reminder of the context, since, in this case, hindsight is important. For over forty years the Soviet Union and its Warsaw Pact allies were the UK's main intelligence target, taking up well over 60% of DIS analytical effort. After the collapse of the Warsaw Pact and the break-up of the USSR, DIS study of Russia was cut back as quickly as possible; I spent a fascinating (and really quite enjoyable) year going round the Main Building of MoD telling senior officers that they had lost their traditional threat and that the DIS was not in the "Rent-a-Threat" business simply in order to justify their jobs. By the mid-1990s, work on the former Warsaw Pact countries accounted for only 16% of DIS analysis, this residual activity being driven mainly by the need to study the Russian equipment that was being exported around the globe and which might, therefore, be used against UK forces

deployed overseas.

So we need to start by remembering how things were then. Throughout the Cold War, Warsaw Pact forces were the main intelligence driver and the prime focus for a host of intelligence collection techniques. As the Warsaw Pact's front line, the twenty divisions of the Group of Soviet Forces in Germany (GSFG) were clearly a threat which we needed to understand as completely as possible. In a very real sense, East Germany was the home of the Soviet Army and of Soviet tactical aviation. As we saw when the GSFG withdrew to Russia, there were simply no empty barracks back home waiting to receive them. They were not alone, of course, as BAOR had much the same problem. Not only did Russian officers and soldiers have to live under canvas, the last helicopter transport troops to return to Russia actually squatted, with their wives and families, in their Hip and Hook helicopters for over a year, a blanket separating the women and children in the rear from the men in the front.

The all-source analyst in the DIS tasked with studying Soviet and Warsaw Pact forces had a very wide range of material to draw on, ranging from unclassified publications to technical intelligence sources which were so highly classified as to be virtually unusable, a major frustration to the desk officer and a problem that I shall return to later. So, where did BRIXMIS fit into all this? It would be easy to give anecdotal examples of individual BRIXMIS intelligence coups, and there are plenty of these described in Tony Geraghty's book, which I commend to you. I would, however, like to look at BRIXMIS from an analyst's viewpoint. To do so, I will take a step back and take a considered look at BRIXMIS as an intelligence source.

The first, and absolutely key, point is that BRIXMIS was not only unique in its origins but had the following unique attributes.

Access. Despite the vexations of Permanent and Temporary Restricted Areas, BRIXMIS could get up close to Soviet forces and their equipment. It could observe and photograph them from the side, from the air and (in the case of aircraft) from below. In some, by now well-documented cases, it achieved hands-on contact with new pieces of kit or pilfered items.

Legitimacy. BRIXMIS had a right to be what it was and where it was, even if not, strictly speaking, to do the things it did. Unlike a





*While the Chipmunk was able to indulge in the 'odd go-round', this practice was not without risk. The soldier in the top right hand corner of this picture of a BMP-1 appears to be taking a pot shot at the aircraft.*

clandestine source, it could not be blown; unlike an attaché, it could not be confined to the capital, although individual members, like attachés, could be declared *persona non grata*.

Training and Equipment. Because the prime function of BRIXMIS, in reality, was to gather intelligence, it was developed into a highly effective collection machine, kitted out with whatever it needed to do the job, including the special equipment developed by DI51e in the DIS Directorate of Scientific and Technical Intelligence, a special vote of thanks being due to that department's Colin Reid, now a member of this Society.

Continuity. BRIXMIS provided continuity in two senses. First, continuity of observation. The problem with satellite passes or overflights is that they give you a one-off snapshot; what you get is what you see (although the Chipmunk flights within the Berlin Control Zone were not averse to the odd go-round). In contrast,

BRIXMIS could keep a target under observation for lengthy periods and judge the best moment for photography. Secondly, continuity of expertise. Over the years BRIXMIS built up an unequalled understanding of its targets and the best ways of attacking them; by the mid to late 1970s it was possibly the most professional military intelligence team in the world.

Synergy. In its early years, BRIXMIS was less effective than it could have been because it did not operate as a cohesive team; in later years it did, and in so doing it maximised its potential. Even more important, however, was the synergy between BRIXMIS and other intelligence sources, including, for instance, HUMINT, SIGINT, defectors and *émigrés*, which provided tip-offs on the location and timing of potential targets. There was also a very important synergy between BRIXMIS and the DIS desk officers who, together with their US and Canadian counterparts, would meet at the annual Ground Forces Conference. An effective DIS analyst would also make sure of briefing BRIXMIS staff in person, to make sure that they understood exactly what was required and, so far as security allowed, why it was needed.

Timeliness. Many valuable intelligence sources tell you how things *were*, rather than how they *are*. A hot item from BRIXMIS could be on the analyst's desk within days.

Releasability. DIS desk officers are driven by two imperatives; to understand everything about their subject of study and to get usable assessments to the people who need them. During the Cold War our own forces, particularly those stationed in Germany, and those of our NATO allies were very important customers. There was nothing more frustrating for the analyst than to prepare an assessment which depended on very highly classified sources which precluded its being disseminated to the front line. BRIXMIS' products were generally Confidential, so a sighting or photograph could provide collateral to unlock key material. Indeed, the customers of DIS must sometimes have wondered how its analysts could derive such a wealth of information from a few fuzzy photographs – little did they know.

So, if BRIXMIS was unique as a source, how valuable were its products and where did they make a real difference? There has been

an assumption that BRIXMIS' contributions to technical intelligence were of most value, and indeed the Tech Int staffs were always the team's main customers. But study of the military capabilities of Soviet forces in the round benefited greatly from BRIXMIS' general observations, while in its later years it was able to provide an invaluable, and still little-publicised, input to studies of Soviet defence production. I will look at each of these three areas in turn.

### **Technical Intelligence.**

For many years BRIXMIS was seen by Tech Int (Army) and Tech Int (Air) as their very own collection arm, and the Tech Int desk officers briefed them assiduously. Photographs were the primary source of information, and here detail was, and is, all-important to any technical analyst. The laws of physics mean that satellites cannot resolve non-linear features smaller than four inches across, but the 1000mm lenses used by BRIXMIS produced prints which allowed photographic interpreters to count individual rivets. Incidentally, rivets can sometimes be important. To illustrate this point, take the case of the appearance of Hind helicopters in the Far East which were observed to be carrying what appeared to be Tactical Air-to-Surface Missiles (TASM). Tech Int (Air) and their CIA colleagues became convinced that this was the case and BRIXMIS were tasked to watch for the delivery of 'TASM-armed Hinds' to East Germany. Their photographs were clear, crisp and showed that the supposed TASM were covered in rivets; they were actually long-range ferry tanks.

But photographs, however good, could also deceive. In 1979, Chipmunk flights within the Berlin Control Zone discovered a large cylindrical object on a railway flat which stumped the UK analysts. At that time, however, the Americans were desperate to prove that the Russians had fielded SS-21 in East Germany. The Chipmunk photographs were on the President's desk the next day as part of the CIA daily intelligence briefing, supposedly providing final proof of SS-21 deployment. This would have been a better story if the object had indeed been SS-21; in reality it was the first ADR-3 ramjet drone to appear in the DDR.

Photography was not only detailed, it could be unique. The Berlin Chipmunk photographed the layout of an entire Divisional Headquarters C2 centre from 300 feet with a 1000mm lens, the results

showing every cable run on the ground. There was simply no comparable intelligence from any other source for over a decade. The same was true of radars and communications systems, where detailed photography of antennae allowed the operating frequencies to be determined, on occasion showing that earlier assumptions of their frequency ranges had been wrong, thus explaining the failure of ELINT to pick up the expected signals. Some BRIXMIS photographs and observations still provide unique details of Russian equipments which remain in operational service to this day. BRIXMIS could also help the Tech Int analyst in relatively simple ways. A debate about how the chin-mounted 23mm cannon in the Hind achieved its high rate of fire was resolved by BRIXMIS sneaking onto the firing range and bringing back a bag-full of ammo clips. Then again, aircraft log-books retrieved via Operation TAMARISK, the 'latrine patrol', provided crucial information on actual engine lives.

Nevertheless, BRIXMIS was not the answer to every Tech Int prayer. The Russians were well aware that any equipment fielded in East Germany would be compromised, so it could be held back, as was Hind for some years. They were so concerned about exposing the T-64 tank that it was six years before it was issued to the GSFG and, when it was, the Russians gave their troops strict instructions that it was not to be photographed. This was very frustrating for BRIXMIS, who always saw T-64s closed down or, if opened up for an engine change, covered with tarpaulins to prevent its being viewed from above. The troops did not, however, take the same care about their ammunition boxes, so a Chipmunk flight provided photographs of neatly laid-out containers whose markings settled the arguments about whether T-64 had a 120 or a 125mm gun; it was the latter.

### **Military Capability.**

In my second category, military capability, the great virtue of BRIXMIS to the desk analyst was its ability to provide 'granularity' and 'ground truth' as seen by trained observers. By 'granularity' I mean the fine detail which allows an assessment of actual, as opposed to theoretical, effectiveness. From its observations of low-level tactics in the air and of associated activities on the ground, BRIXMIS was able to report on, for instance: the attack profiles flown by helicopters; the way in which air-mobile assaults were carried out; the numbers of

Hips involved, noting the number of troops each one carried and the strength and deployment of the Hind escort. Indeed, BRIXMIS showed that while a Hip could carry twenty-four troops, in practice its standard load was twelve, which, in retrospect, made much better sense of intelligence on Soviet operations in Afghanistan. On the ground, exercise observations could yield information on: the actual speed, and the spacing of the individual units, employed in a tank assault; breakdown rates and recovery procedures; column makeup, movement and traffic control. Similarly, monitoring deployments in the field showed how good camouflage, security and self-defence measures were. In fact, these observations showed a good deal of sloppiness, with poor self-discipline and lax procedures; for example, live rounds were not accounted for on the ranges.

‘Ground truth’ is probably self-evident. The forces in East Germany were those which would spearhead any attack on NATO and which would, therefore, also be the target for Western counter-attacks. BRIXMIS provided information on fixed facilities such as airfields and C2 centres which was fed directly into RAF targeting. Its observation of Hind formations on the range enabled RAF Germany and 2ATAF to develop counter-tactics. BRIXMIS also provided reliable information on actual force strengths which helped to offset ‘ORBAT inflation’. For example, SIGINT was very good at tracking Russian aircraft coming into East Germany, but less effective in spotting those which were leaving, so the numbers on the books tended to rise inexorably. By actually counting the number of aircraft on the ground, BRIXMIS applied an effective counter to ORBAT inflation. Similarly, close monitoring of the training and *roulement* cycle gave a fix on the overall manpower strength of GSFG.

### **Defence Production.**

The final area in which the BRIXMIS’ product was of particular value was in the study of Soviet defence production. There is a common misconception that the Tech Int staff, or some other element of the scientific and technical intelligence community, monitored military R&D closely, and that it was their work which gave early warning of next-generation systems. In fact, this early warning was provided by the unsung heroes on the defence production desks. (I must declare an interest here, having been responsible in the mid-

1970s for DIS assessments of land arms production.) It was the industry analysts who picked up article numbers and followed them through research, development and trials into series production. In doing so they were, in effect, trying to map out the overall Soviet defence procurement programme for the next ten to fifteen years. The Tech Int view was, understandably, that they needed to have some hard information on a bit of kit before they could provide any useful assessment of its performance, although at times this did not deter them from robustly disputing the conclusions of the defence industry analysts. At its best, the resulting sparks provided illumination which helped both sides; at its worst a short-tour Tech Int officer would be unable to rid himself of his British land or air force mind-set which prevented him from ‘thinking Russian’.

The saga of the T-80 provides a good example of the value of BRIXMIS in this area. The tank production desk officer had been tracking ‘Article 219’ for some time. It was known to have a unique power plant and to be associated with a helicopter design bureau. The analyst’s synthesis of all his sources led him to conclude that it was a new tank with a gas turbine engine. The US doubted that ‘219’ was a tank at all, let alone one with a gas turbine. Eventually, BRIXMIS spotted a notice board in GSFG which included 219 in a list containing other article numbers known to be tanks. Operation TAMARISK yielded a secret document which showed that 219 had a computerised fire control system and fired a missile through its gun barrel. This confirmed that it was a tank and suggested that it would soon be deployed within GSFG. Marshal Ustinov attended a demonstration of, what turned out to be, the T-80 on the Letzlinger Heide, BRIXMIS being able to obtain photographs of its rear and record the characteristic high-pitched whine of a gas turbine. This was, incidentally, the only example I have come across of BRIXMIS engaging in ‘ACOUSTINT’. Very late in the day, the American analysts were forced to concede that the Brits had got it right. We did not always do so of course; the document giving details of Article 219 also referred to an ‘Article 447’, which the same British desk officer had concluded was a new tank with angular Chobham-type armour. In fact, subsequent photography showed that Article 447 was an up-armoured T-64 with appliqué explosive reactive armour rather than integral Chobham armour.

BRIXMIS was guided to the collection of factory markings, designators and serial numbers whenever possible, on both ground and air equipments. These provided 'ground truth' for the defence industry analysts. The serial numbers were usually scrambled but they could be deciphered to reveal the place and date of production. The May Day raid on a T-64 garage, described so graphically in Chapter 9 of Tony Geraghty's book, provided a wealth of data which allowed the tank's production run to be determined, but this was only one of many successes in the 1980s. Photographs of aircraft serial numbers were trickier to obtain but, when they could be provided, it permitted the air analyst to fill in his blocks of aircraft allocations.

### **Comparison and Assessment.**

Finally, having looked at the value of BRIXMIS to the desk officer as one source among many, a few words on BRIXMIS in the wider context, starting with a look at its French and American counterparts in East Germany. There is little to say about the French; if they had notable successes they kept them to themselves, although the 1984 murder of *Adjutant-Chef* Mariotti in an engineered traffic accident does suggest that the French Mission was seen by the other side as a threat. The professionalism of the French Mission was rather brought into question, however, by their habit of leaving empty wine bottles where they had been lying up! Both the French and the American Missions were smaller than BRIXMIS which meant that they toured in pairs rather than threes. The UK was able to tour for longer, while the extra pair of eyes acting as spotters made its teams much more effective.

The US Mission was keen, possibly too much so; a former member of both BRIXMIS and the DIS has described them as having "big feet". The US Mission was tasked by a multitude of US agencies, but their prime customers were the analysts of the National Ground Intelligence Centre in Charlottesville, the US equivalent of our Tech Int. Curiously, the customers did not visit the US Mission and members of the Mission were not allowed to visit Charlottesville. The Americans did not help matters by classifying all BRIXMIS reports, including those from the Brits and French, as NOFORN (ie not to be released to foreigners). This led to the absurd situation of a UK member of BRIXMIS who, unlike his American counterparts, was

allowed to go to Charlottesville, being refused permission to see his own reports! On the other hand, 18 MI [the 18th Military Intelligence Battalion, the American counterpart of BSSO(G)] did maintain close contact with BRIXMIS and attended its briefings, to the benefit of both sides. BRIXMIS saw 18 MI as a welcome rogue in the over-controlled US system.

In the UK, the FCO, and indeed parts of the MoD, were never very happy with BRIXMIS' intelligence collection role and made the most of any opportunity to play up the risks, as against the benefits, of its work. The FCO representative on the Joint Intelligence Committee (Germany) [JIC(G)] was seen by many in BRIXMIS, and the DIS, as someone who could be relied upon to rat on the Mission, exaggerating the adverse implications of any incident in an attempt to damp BRIXMIS down. At the reunification of Germany, the FCO took delight in closing BRIXMIS as soon as possible, even though means might have been found, with German support, to maintain its capabilities against the Soviet forces which still remained in Eastern Germany. I had the task of trying to keep some form of collection going in the face of FCO opposition. I failed. Fortunately for BRIXMIS, the CinCs at HQs BAOR and RAFG were always very strong in their support, as should be any commander having the extraordinary benefit of trained personnel authorised to operate behind the enemy's front line.

Beyond the DIS, I think it is fair to say that the UK intelligence community had, at best, a very weak appreciation of the value of BRIXMIS as a source. For this, the MoD was partly to blame; BRIXMIS was kept very much under wraps and, as with so many intelligence successes, it was felt best not to trumpet its achievements too loudly. But perhaps its greatest handicap was what the analyst saw as one of its greatest assets, the fact that its products were generally classified no higher than Confidential. On both sides of the Atlantic, but particularly in the US, the value of intelligence was linked in the minds of decision-makers to high tech, high cost and high classification. If BRIXMIS achieved its ends by 19th Century means; if it cost only small change to run and if it produced material that was barely classified; how could it compare with TOP SECRET intelligence carrying cryptic codewords? This 'intelligence snobbery' always worked against BRIXMIS. It still exists today, although it has



now been joined by the contrary, and equally fatuous, misconception that everything can be found in open sources. But that is another story.

In the last resort, BRIXMIS was appreciated by the people who really mattered, the all-source desk analysts who, with their multitude of information streams, understood just how valuable BRIXMIS and its products really were. I would assess it as, quite possibly, the most cost-effective intelligence collection organisation of the past century. BRIXMIS was a unique organisation which operated in a unique period of history, and its products were uniquely valuable.

## MORNING DISCUSSION PERIOD

**Wg Cdr Jeff Jefford.** During the 1960s, we Cold War warriors of the V-Force were sometime told that Russians were eight feet tall and sometimes that they were only four feet tall. Do we now know how tall they *really* were?!

**Gp Capt Richard Bates.** They varied. We were, for example, particularly impressed by their low level helicopter operations, especially with late-model Hinds, in weather which might well have curtailed our own operations. On the other hand, air-to-ground firing exercises by fighter/ground attack aircraft were far less 'aggressive' and they tended not to fly as low as we would have done. But I would certainly put the Hind helicopter force at nearly six feet tall.

**Gp Capt Steve Wrigley.** While we were given a modicum of training before joining the Mission, few of us had very well developed ideas about the Soviet concept of soldiering until we actually met them or observed them in the field. It was surprising just how like us they were in some ways but unlike us in others. They were certainly less efficient, quite stupid on occasions, and poorly prepared. Not 'professional' is how I would sum it up. But, against that, one does have to acknowledge those Hind pilots, and the very rapid reactions on some of the more sensitive sites. Some sites were particularly well organised and you had to be very quick to get away with anything; at others it could be relatively easy. So, it was patchy; they definitely weren't *eight* feet tall.

**John Morrison.** From the analyst's point of view, Soviet capabilities were something of a curate's egg. They had areas of particular strength and areas of great weakness. Many of their weaknesses stemmed from the fact that they had a conscript army, which obliged them to be 'procedure bound'. Other problems arose because they lacked confidence in the expertise of the individual. Air interceptions, for instance, were always closely controlled; the pilots weren't given any freedom of action. Then again, if you consider the tools they were using, their aircraft had excellent airframes and engines good for 500 hours, but lousy electronics. There were (and there still are) areas where Russian equipment was the best in the world, but they had

notable weaknesses as well. So, I would say that they were eight feet tall in some respects but only four feet tall in others.

**Bates.** I would just add that the Mission recognised that the Soviets always made their equipment their main concern. Their men, the conscript soldiers, were afforded a much lower priority, hence the lack of toilet paper, even socks and boots. Such matters were simply not important; only guns, tanks and aeroplanes were, although this pattern was less apparent on the air force side, where we were routinely able to observe a fair degree of competence.

**Gp Capt Hans Neubroch.** Perhaps I could offer a personal assessment of 24 Air Army in the late 1950's. They only flew on Tuesdays and Thursdays, almost entirely by daylight and to a fixed programme. If the weather deteriorated, the local commander appeared to have no discretion other than to cancel. Individuals flew in a very stereotyped fashion. At that time, we were facing what I would call an 'OTU air force'.

**Air Chf Mshl Sir Michael Armitage.** Perhaps I could welcome General Davis to the conference and ask him whether he would like to comment on the apparent lack of discipline among the Soviet forces and perhaps say something about Operation TAMARISK.

**Maj-Gen Brian Davis.** The Soviets certainly treated their juniors appallingly. They really were just cannon fodder, even in peacetime. At a Soviet barracks it was quite common to see soldiers foraging for fuel on a pile of coke - like ants on an anthill. In the towns, the patrols were often led by junior officers who would frequently be drunker than the soldiers. Incidentally, I never saw a Soviet officer in the field with a map. For their major troop movements they relied entirely on their traffic regulators, chaps in black overalls with white hats. A few Soviet personnel had married quarters, but most didn't. They were very badly cared for; the welfare aspects of leadership, as we understand them, simply were not there.

TAMARISK was an extremely productive, if very messy, way to gather information. For the most part, we didn't know what we had got, because it was not easily identifiable until it had been sorted out. We passed most of the best TAMARISK stuff to the American Mission, thus ensuring, if you'll forgive the phrase, that the shittiest

bits were sent back to President Eisenhower! It was a very valuable source, particularly in the context of Afghanistan. The Russian public was becoming increasingly perturbed at the casualty rate and we suspected that a lot of the wounded were actually being looked after in East German military hospitals. At one time we had the extremely distasteful task of going around hospital rubbish dumps looking for amputated limbs. We were after positive evidence of wounds caused by shrapnel or bullets, damage that could not possibly have been sustained in, for instance, a traffic accident. We did find a lot but we eventually had to curtail the programme due to the health hazard to the Mission.

**Air Mshl Sir Frederick Sowrey.** Was it possible for BRIXMIS to assess the Soviets' command ability, at unit level or above?

**Bates.** I don't think that we could really do that from our field observations but quite a lot could be inferred from informal liaison with individuals, higher ranking officials of SERB, for instance, or the Chief's occasional meetings with the Head of GSFG. That kind of conversation was a useful secondary method of gleaning bits of information. These were fed back to the analysts at Rheindahlen and MoD who would then piece together the whole picture. So, it was possible to construct a pretty good impression of the overall organisation, but not from driving down the road in a Landrover.

**Davis.** So far as troops in the field were concerned, it was obviously very difficult to assess the capabilities of individuals. But you could form an impression from the way their troops behaved. Did they have good route discipline? Did they maintain a decent distance between vehicles? Did they have an alert air sentry? Were they all dressed much the same and did they look reasonably well turned out? Were the traffic regulators efficient, and did they salute the officers? If they did all of these things, you got the feeling that the outfit wasn't half bad. Some were an absolute shambles.

Another useful indicator of a unit's ability to do its stuff was the breakdown rate. After a tank division had gone through, even if you had missed it, you could usually follow its route the next day by the breakdowns. The crews would be left to fend for themselves. Nobody would worry much about them, so they would build a little fire and

settle down to wait. You could often trace the route from the smell of petrol too. Clearly, such a unit wasn't as well organised as one which maintained its vehicles better. These were the sort of pointers to look out for.

One also met some of their more senior command folk from time to time at occasional 'remember-how-we-beat-the-Fascists-in-the-Great-Patriotic-War' bunfights, such occasions providing opportunities to make personal assessments. I rated some these individuals as pretty smart.

**AVM John Herrington.** As a former DIS member, perhaps I could add one or two points. I recall that the British Army wanted to know the thickness of the armour on the latest Soviet tanks in order to calculate the weight of shot necessary to penetrate it. At the time, they were interested in the T80 and BRIXMIS eventually produced data which showed that its armour would require something like depleted uranium ammunition, and that was the beginning of an important development in anti-tank artillery for the British Army.

The reports that came back from BRIXMIS, and from some of our attachés in the Eastern Bloc countries, were very important. Apart from helping to determine the locations and rates of deployment of new Soviet aircraft, they also shed light on changes of doctrine within the Soviet Air Force, all of which permitted us to predict how the Russians were likely to operate in war. BRIXMIS provided us with intelligence which we simply could not have obtained from any other source. Furthermore, they delivered it with 'value added', because they were all experienced military men who understood what they were looking at.

**Bates.** In connection with tank armour, those of you who have read Tony Geraghty's book will recall that he mentions the use of a small tungsten tool to take scrapings from tank hulls, permitting the paint to be analysed and providing samples of the metal from which it was made. BRIXMIS had a very sophisticated little group dealing specifically with army technical matters of this nature. It included a number of SAS people who were badged as paratroopers, although I doubt that that fooled the Soviets. Even so, if one was lucky enough to find a tank, it was quite another matter to get close to it, let alone actually to 'attack' it.

**Cecil James.** Might it have been a good idea for a tour with BRIXMIS to have been considerably longer than usual? What was the policy?

**Bates.** Everyone who served with BRIXMIS would probably have liked to have stayed longer than they did, but career planning and other considerations meant that we all had to move on.

**Neubroch.** The adrenaline factor has been mentioned and it is an important point. While the chaps enjoyed themselves hugely, this enjoyment was not always shared by their families. Some wives certainly felt the strain and that may have been a limiting factor on tour lengths.

**Wrigley.** One or two people were lucky enough to do second tours and having a remit to run around the DDR doing exciting things was certainly addictive. People liked it and you needed to keep a weather eye on them to make sure that overconfidence did not upset the rather delicate balance. Even though we were doing things that were well outside the norm, we were still a military unit and our activities had to be properly controlled and authorised. In other words, it was important to avoid anyone's going 'over the top', and a tour length of three years was probably about right.

**Sqn Ldr Dick Turpin.** To what extent do you think the Soviets indulged in 'showcasing', deliberately using misleading information; the notorious 'boxed SA-8' is an example of what I mean?

**Wrigley.** I'm not aware of many cases, although BRIXMIS would only have learned of them in arrears. Our function was to unearth information, take our photographs, write our reports and comment as far as we were able. But we were not analysts. This sort of thing might well have got past us, but it might have been picked up at the Centre.

**Morrison.** I can't actually think of any examples of methodical showcasing. In order to exploit BRIXMIS as a channel for misleading the West, the Soviets would have had to know precisely when and where they were operating, which they usually didn't. A better means of spreading *disinformation* would have been through something like a formal parade, which they could expect to be monitored, and we know that the Russians did do this in Moscow. On the whole,

however, I think that the Soviets were more concerned with concealing their capabilities than with exaggerating them.

**Peter Skinner.** What of reciprocity? Did the Soviets have equal opportunities to enter the Allied Zones and, if so, do we know to what effect?

**Bates.** Yes, they had SOXMIS, the Soviet Exchange Mission. They were like BRIXMIS to some extent, in that they were 'a Mission' but in the West one did not really need to burrow under the runway at Gütersloh in order to observe Harrier operations. All you had to do was subscribe to the *RAF News* and *Flight* magazine. The value of SOXMIS to the other side was not so much to gather technical information, as the fact that it gave them access to their runners, moles and other silent partners. I don't myself recall ever having seen a SOXMIS car, although there were orders on all the RAF Germany stations as to what you were to do if you did see one around your airfield. But this did not happen very often; the Soviets had other fish to fry.

**Morrison.** A number of assessments were carried out over the years in an effort to discover exactly what SOXMIS was doing. To my recollection, we never did get a very good handle on them. We assumed that they were servicing GRU agents. But we did not know, for example, whether they were also looking after KGB agents. Experience elsewhere suggests that they would not have been, because there was some rivalry between these agencies.

**Davis.** One of the difficulties we (that is BRIXMIS) experienced with the SOXMIS (who, incidentally, to the best of my knowledge, never worked at night or slept out) stemmed from the way they were treated, particularly in the British Zone. The Soviets reacted almost immediately to any interference, their retaliation sometimes involving a degree of violence which could make life quite uncomfortable for us. The people responsible for monitoring SOXMIS activities in West Germany, seemed to have no real conception of the implications of their actions.

**AVM Nigel Baldwin.** Could someone amplify the relationship between BRIXMIS and your French and American colleagues? Were efforts co-ordinated? Was there some 'UK EYES ONLY' stuff?

**Bates.** There was a great deal of very close liaison. There may have been odd matters which we referred to Rheindahlen or MoD before passing them to our American and French colleagues but, generally speaking, we operated almost as one agency. This is underlined by the fact that it was SOP for a returning tour to go straight to the US Mission to submit its immediate highlight report. A full report, with photographs, would follow, normally within a couple of weeks; a lot of these being copied to USMLM and FLM. We're not entirely sure that we always got the same service from the Americans and we *know* that we didn't from the French. The French definitely had their own agenda and their own way of doing things. Nevertheless, we did have a very close *rapport* with them; we liked them and we enjoyed working with them.

**Davis.** We had tri-Mission meetings about once a month. They were not concerned with intelligence scoops so much as deciding how to deal with potential problems. We would, for instance, establish a common approach to a slightly dodgy PRA boundary. These, having originally been sketched 'on the back of an envelope' in 1946, had been gospel ever since. If the Soviets moved a road a bit we needed a common line in the event of anyone being picked up, by the Soviets, the NVA, the *Vopos* or anybody else, in an area which we regarded as a disputed PRA border. Quite a lot of that sort of thing went on but, in my experience, there was very little direct exchange of intelligence *per se*, although I think there was a close relationship further up, certainly with the Americans. The French were a bit different; they certainly did their own thing and I'm sure that they found out a lot which they never told us about.

**Morrison.** From the viewpoint of a desk analyst, we rarely saw anything from the French and I've already mentioned the problem with the Americans, which was that, once *our* information reached the US, it was classified NOFORN and they had to make a positive effort to release it back to *us*! Having said that, the good relationship between the analysts, lubricated by the beer drunk in London during the annual Ground Forces Conferences and the Allied Land Warfare Technical Intelligence Conferences did foster good personal relationships.



**Mike Meech.** Having had some involvement with such matters in the past, I was interested to hear about the Soviet's general lack of success in ambushing BRIXMIS. Was there any improvement in their techniques over time?

**Wrigley.** It's a good question, although each of us can answer it only from personal experience within a specific timeframe. To some extent, Soviet success depended upon the agency involved and its intentions. Sometimes it was the local Service unit, reacting to defend its patch; I certainly remember a Russian Army major throwing a rock at my car at Merseburg! But that's another story. They got on to us pretty quickly there – or perhaps we were slow; it doesn't really matter, the point is that they found us. The 'narks' aims were probably different. Rather than trying to detain us, they were more interested in establishing our presence and monitoring our activities. In much the same way, we would take photographs of them watching us! Although the 'narks' didn't usually interfere directly, they probably tipped off people who would then come looking for us. I think that we were pretty good at avoiding them. As I said earlier, if you even *felt* that something was happening, you simply moved on.

**Neubroch.** From my perspective, they certainly appeared to have improved their techniques. From what I've heard they had countermeasures in force later which hadn't existed in my day. The only thing we had to contend with were the 'narks', whose purpose was simply to stop us from doing our job. Other than that, unless you actually went *on* to a military site, you had very little to worry about. Even then, there would often be only a single guard and, rather than deal with the situation, he might well just turn his back on you!

**Wrigley.** It is worth making the point that, it mattered not whether they actually caught you. If anyone diverted you away from your target they had succeeded in spoiling your day's fishing!

**Gp Capt Peter Hearne.** Several references have been made to Soviet Special Forces. In the 1980s there were all sorts of horror stories about the *Spetznaz*. Were they as good as the popular press suggested?

**Morrison.** We had a pretty good handle on the numbers of *Spetznaz* being trained, so we knew the overall size of the force. What we didn't have was an understanding of how they would actually be used, in

what numbers and against which targets. As I recall, we assumed that about 300 would be assigned to the UK and from there we hypothecated the sort of things that they *might* do from a knowledge of their capabilities. The possible targets, our 'Key Points', were all protected appropriately. We had to make assumptions about things like suitcase-sized nuclear weapons. Did they have them? Could they bring them in undetected?



*This picture was taken in 1994, long after the Berlin Wall had come down, but it serves to show how Gatow's Chipmunks could overfly the many Soviet barracks located in and around the city. In earlier times, the crew would have counted and photographed the vehicles in the MT yard, hopefully finding some with their covers off to reveal their innards*

## AIRBORNE ELECTRONIC RECONNAISSANCE, 1948 TO 1989

### Wing Commander David Paton, assisted by Master Aircrew Derek Oliver



*Wg Cdr Davie Paton joined the RAF as a navigator whilst reading for a degree in Philosophy at Edinburgh University in 1973. His first tour was with No 100 Sqn at Marham, this being followed by seven consecutive stints of overseas duty. These comprised: three tours in Germany on Buccaneers and Tornados; one in the USA with the Joint EW Centre in San Antonio; two in Saudi Arabia, one as an advisor to the RSAF, the other as the RAF CO at*

*Dhahran and, later, Al Kharj; and an appointment as the RAF representative at the French Staff College. He is currently stationed at Waddington as OC No 51 Sqn.*



*David Oliver enlisted in the RAF as a clerk in 1974, re-mustering as a Radio Operator (Voice) in 1977 and becoming an air signaller in 1986. He has served on No 51 Sqn ever since. As a ground tradesman he served on Signals Units located in the Shetland Islands, the Falklands, Berlin and Gibraltar and with the Ops (EW) Sqn at Wyton. In the air he has amassed over 6,000 hours mostly in the Nimrod R.1, but including*

*some experience in US Navy EP-3Es, USAF RC-135Vs and Nimrod MR2s. His more recent active service has included Operations DESERT SHIELD, STORM and FOX and ALLIED FORCE.*

I have been asked to speak on the subject of airborne radio surveillance and the very clear guidance that I have been given is that I am to confine my remarks to a potted history of the type of operations in which No 51 Sqn, my squadron, and its precursors have been involved. I have to start by confessing that I have found it very difficult to put together the sort of presentation that you require and deserve. Given the constraints of classification and the fact that my paper will be published in the Society's journal, implying, at least a

measure of, official sanction, I have to make it quite clear that nothing that you will hear from me this afternoon has been drawn from classified sources. (*While this was clearly a seamanlike precaution, the reader's attention is drawn to the disclaimer that appears on page 2 of every Journal. Ed.*) Furthermore, no attempt should be made to read across from the type and style of operation of thirty and forty years ago to the sort of work in which the squadron is currently engaged.

I intend, in the half hour that has been allocated to me, to examine some aspects of airborne radio surveillance during the Cold War era, say from the end of WW II to the end of the 1960s. I must stress again that everything has been taken from unclassified sources; all that I have sought to do is to present this information to you in a coherent form.

'Airborne electronic reconnaissance' is a phrase that I shall use frequently so it is important that we understand what it means. It involves the use of aircraft, specifically modified to carry equipment capable of examining radio and radar emissions, with a view to assessing the combat capability or intentions of hostile nations or organisations.

Before we start to look at the Cold War, it is important to recognise that the RAF had gained a fair measure of experience of airborne electronic reconnaissance, and of other clandestine operations, during WW II. I offer you an observation made by Air Cdre Addison, AOC No 100 Gp in 1944, who said of some of the activities of his unique command:

"Not less valuable, however, have been the results obtained by those units whose job it is to confound our enemies or to probe into his technical secrets. Although not so spectacular, these latter roles are of vital importance and frequently produce results whose value either cannot be fully appreciated at the time, or, if known, cannot always be divulged for reasons of security."

I think that we can safely deduce from this that Edward Addison had been thinking of some of the airborne electronic reconnaissance operations that were then taking place, the most telling phrase, to me, being the reference to 'probing into the enemy's technical secrets'.

It is not, I think, unreasonable to assume that the work of special ops units during WW II had made a significant impact on officials

within the Air Ministry. Nevertheless, in the immediate aftermath of the war, the allies were overcome by lassitude. There was a general determination that, after fighting two world wars in less than half-a-century, there was not going to be another; we were literally 'war weary'. One of the 'dividends' that was realised from peace in Europe and the Far East was a decline in airborne electronic reconnaissance, there simply being no further need for this specialisation. In the euphoria of peace in Europe, the first of the RAF's electronic intelligence units, No 192 Sqn, was disbanded. Fortunately, however, its expertise was not entirely lost, as many of the squadron's personnel were absorbed into the Radio Warfare Establishment at Swanton Morley. This unit soon moved to Watton where, in 1946, it became the Central Signals Establishment.

Nevertheless, there was little British activity in the sphere of airborne electronic reconnaissance until 1948. In that year, however, there was a revival of interest. Why should this have been so? And why did it happen when it did? The answer to both of these questions lies in increasing concern among the military and political leadership at the scale and nature of the potential menace represented by the Soviet Union and the threat that this could pose to all Western nations and this country in particular. The UK appreciated that it had little understanding of the military and economic capabilities of the USSR, particularly those which it had acquired since the end of the war, a war in which Western military observers and liaison officers had fought alongside Soviet forces. From these liaison officers, and through diplomatic channels, the UK had been able to track wartime developments in the Soviet Union's burgeoning military and industrial capability. Since then, however, we had lost touch with what was going on in that country as the Soviet Union withdrew into itself to nurse its wounds after fighting the bloodiest and most costly war in its history.

By 1948, however, there was little doubt that the main post-war threat to international stability was going to be the Soviet Union. It is immediately apparent why this should be if we consider the globe as seen from a point above the North Pole. The USSR was a huge tract of land and although limited economic and cultural exchanges did take place, they did so only under strict control and only within those areas sanctioned by the Soviet authorities. In the West, we simply did not

know what was going on in the interior of this awesome empire and this fear of the unknown drove the need for electronic reconnaissance missions.

Perhaps it will sharpen our perspective if we bear in mind that U-2 overflights were not possible until the later 1950s and the era of spy satellites would not begin until the mid-1960s. As a result, the West lacked information on what the Soviet Union might be doing in its heartlands and this secrecy fostered a considerable degree of distrust.

Looking back on the period today, we need to try to view the situation as it would have been perceived by contemporary political and military leaders. The UK and its allies had recently witnessed the military might that the Soviet Union had been able to direct against the Third Reich and the crucial part that this had played in Germany's eventual defeat. Remember, too, that the Russian Revolution was less than forty years old. The behaviour of the Communist regime that now controlled the vast tract of land and the multitudes of people that had once been the Tsarist empire was proving to be highly unpredictable. The only certainty was that it was seen to be gaining power in the countries of Eastern Europe, this power being underpinned by the awesome military machine that had brought about the downfall of Hitler.

The first signs of a revival in the RAF's electronic reconnaissance capability came in September 1948 when a Lancaster and a Lincoln were deployed to Habbaniyah in Iraq. These aircraft, which were fitted with a crude radio receiving suite, flew sorties along the border of the Soviet Union listening to signals traffic. This early example of an electronic reconnaissance operation highlights one of the key requirements of such activities, the need to get as close to the hostile frontier as possible. It may be trite, but it is also true, to say that you cannot gather information about the enemy and their signals unless you are close enough to receive them. Hence the need to operate from forward operating bases that allow you the maximum time on-station. Another early example is provided by a Lancaster, modified to have a radio monitoring capability, which was deployed to Malaya where it operated in the electronic reconnaissance role during Operation FIREDOG.

But I want to concentrate on the efforts of the RAF against the Soviet Union. During the 1950s, the Central Signals Establishment



*A Lincoln B.2/IVA sporting No 199 Sqn's blue and white spinners in 1956. Note the non-standard radome under the nose. (MAP)*

was to become increasingly important in the context of airborne electronic reconnaissance. In 1951, No 90 Signals Group controlled Nos 192 and 199 Sqns. A year later they were joined by Nos 116 and 527 Sqns. The main types being flown at the time were Washingtons, Lincolns and Mosquitos, Canberras and a few Meteors being added in 1953.

By now it had been accepted that electronic reconnaissance would have to be a growth industry if any sort of meaningful watch was going to be kept on the Soviet Union. This led to a requirement for a dedicated electronic reconnaissance unit built around a cadre of experienced operators whose function would be to monitor radio and radar transmissions. I will focus initially on one of the units that I have already mentioned, No 192 Sqn, which would be renumbered in 1958, to become the present No 51 Sqn.

No 192 Sqn was reformed in 1951 with Lincolns, taking delivery of three Washingtons a few months later. The choice of equipment was significant as aircraft that are going to be used for electronic reconnaissance need, generally speaking, to be large for three reasons. First they need to have long range and a good loiter capability. Secondly, they need to be big enough to accommodate special-to-type electronics and a number of specialists able to operate this kit and carry out some on-board analysis. Finally, four engines are an advantage, because they enhance the reliability factor while providing the generating capacity needed to power and, just as importantly, to cool the electronics. Although they retained their rear turrets, the

Washingtons were stripped of all their other armament, freeing enough space to permit them to carry a team of between six and ten equipment operators who would have been a mix of radar and radio specialists. It was one of No 192 Sqn's Washingtons that achieved the *coup* of establishing that the Soviets had acquired an airborne radar intercept capability when it recorded the SCAN ODD radar aboard a MiG-15.

Apart from provoking the Soviets into using their radars and radios, No 192 Sqn had a maritime role. For instance, whenever the Soviet cruiser *Orzonikidze* put to sea, it was monitored by the squadron. Another example is provided by Exercise MAINBRACE, a major air/sea event held in 1952, in which the squadron exercised one of its wartime commitments to the Fleet in the North Sea by detecting signals from the attacking force to provide warning to the threatened units. At least one of the squadron's Washingtons was deployed to Cyprus in 1956 during the run up to Operation MUSKETEER, the Suez campaign. No 192 Sqn was able to provide signals intelligence, notably that the Egyptians regularly shut down their air defence radars just after mid-day, which will have been useful in planning operations.

From this, albeit limited, selection of events from No 192 Sqn's career, one can see that electronic reconnaissance activities can have applications within tactical as well as strategic scenarios. What do I mean by this? The strategic aspect involves, in essence, flying regular sorties to update the UK's databases of radar and radio systems operated by potential enemies. In a tactical context, similar missions can be undertaken in direct support of the air, land and maritime forces which are engaging the enemy, the presence of an electronic reconnaissance aircraft with its specialist and highly trained crew clearly having the potential to make an immediate impact on the battlefield.

No 192 Sqn was not the only unit conducting these clandestine missions (termed 'Air Ministry Operations' at the time), of course, but the whole business was reorganised and given increased prominence in 1958 when the erstwhile HQ No 90 (Signals) Gp at Medmenham became HQ Signals Command. By this time the Washingtons and Lincolns had been supplanted by Canberras and the Comet was beginning to establish itself in the electronic reconnaissance role with, what had now become, No 51 Sqn.





*Taken on finals (a lá BRIXMIS), this photograph of one of No 51 Sqn's Comets reveals a variety of lumps, bumps and antennae. Like this example, most of the Comets which operated in the ELINT role retained the original square windows which, because of their vulnerability to metal fatigue, probably imposed significant constraints on the use of cabin pressurisation. (MAP)*

At this point I think it would be appropriate to focus on the Comet, the precursor of the Nimrod R.1s that the squadron currently operates. It is important to realise that airborne electronic reconnaissance operations demand highly specialised equipment and equally specialised and highly trained manpower; it is not something that can be done on the cheap. No 51 Sqn's Comets, which were fitted with state of the art equipment, cost half a million pounds each at late 1950s prices (*of the order of £6-7M today. Ed*). The flight deck crew consisted of a captain, co-pilot, air signaller, air engineer and two navigators. Accurate navigation was essential, partly because the aircraft were routinely flown very close to international borders, with the attendant risk of encountering fighters should they stray across a frontier, and partly, and equally as importantly, to ensure the accuracy of the navigation system that was being used to plot the locations of the emitters that were being monitored. The requisite degree of navigational accuracy was provided by the two navigators and an equipment suite that included GREEN SATIN Doppler, BLUE SHADOW sideways looking airborne radar, a Mk IV Ground Position



*No 51 Sqn's Comets were supplemented by a small fleet of modified Canberra B.6(RC)s like this one. (MAP)*

Indicator, Distance Measuring Equipment, GEE, a radio compass, a Decca Navigator Mk III or IV and a periscopic sextant. There was also provision for LORAN to be fitted later. In addition to the flight crew and the team of special operators, the Comets could also carry up to a dozen groundcrew to provide the degree of autonomous technical back-up necessary to support prolonged deployed operations.

So what was it that the squadron was trying to discover? Essentially, as much as possible about the defensive radar system ranged along the borders of the USSR and its Warsaw Pact allies and around high-value point targets that would be the prime candidates for destruction in the event of war. Were there any gaps in the coverage? What was the response time of the system? How was command and control exercised, and how effectively? If effective electronic counter measures were to be developed, it was also necessary to know the specific characteristics and capabilities of each type of radar.

A particular cause of concern in the 1950s was the suspicion that the Soviets might be building up a large long range bomber fleet that could threaten the population centres of Europe and North America. It was feared that the USSR might soon acquire a devastating first strike capability which it could then exploit, in Europe at least, with its massive concentration of conventional ground forces. Of equal concern were fears that Western air forces might be unable to penetrate Soviet defences to reach their targets and, even if they did, that they might not be able to identify their aiming points. For all of these reasons, missions operating close to (or within) Soviet airspace were tasked with monitoring the Soviet response. The aircraft doing this needed equipment with which to examine enemy electronic

emissions and they also had to be capable of detecting air and ground threats so that early evasive action could be taken.

In order to try to discover more about what lay within the Soviet Union, both the USA (notably with its U-2 programme) and the UK established 'special duty flights' which were tasked with penetrating Soviet airspace. The initial aims were to confirm or disprove the development of a fleet of long range bombers and to bring back photographic material, to assist in radar navigation and bomb-aiming. Such activities were bound to provoke the Soviet defensive system and this provided opportunities for electronic monitoring from both air and ground platforms. The successful long-range penetrations of Russian airspace by RAF-operated RB-45s in 1952, and again in 1954, provided ample evidence of the Soviet Union's inability to detect and destroy intruders at that time, although this may have been partly due to route selection based on the known deployment and characteristics of the defences.

In 1955, Vickers Valiants of the newly reformed No 543 Sqn began to fly missions intended to reveal weaknesses in the Soviet Union's defences while No 199 Sqn, having also acquired some Valiants, had been renumbered as No 18 Sqn and become a specialist unit in the field of Electronic Counter Measures. No 18 Sqn operated in this role until the mid-1960s, by which time it had become possible to provide each Victor and Vulcan with its own self-protection capability. Meanwhile, there had been further changes in the constitution of Signals Command, No 116 Sqn having become No 115 Sqn in the late 1950s while No 527 Sqn had been renumbered as No 245 Sqn. No 151 Sqn was reformed in 1962, only to be renumbered as No 97 Sqn in 1963, at much the same time as No 98 Sqn was established by renumbering No 245 Sqn. These units were equipped with a variety of aircraft, mainly Canberras and Varsitys plus the odd Hastings. While all three of these squadrons were concerned with 'signals', their roles were primarily calibration, on a world-wide basis, rather than intelligence gathering.

One last thought about the conduct of airborne electronic reconnaissance, if you are looking for something very specific, you need to know where and when to be doing it. This is, of course, absolutely vital if you wish to record an event of short duration, such as the trial firing of a missile system. There are many ways in which

this sort of information might be derived but, whatever the source, the aim will be to have one's aircraft at the best location and altitude from which to monitor the activity at the time that it is expected to take place. Alternatively, the mere presence of the electronic reconnaissance aircraft itself may be sufficient to make an event happen, as was the case when No 192 Sqn provoked a MiG-15 pilot into using his radar, permitting its transmissions to be recorded and analysed.

Given the constraints of the classification within which I have had to work, I am very conscious that I have done little more than skim the surface of my subject. Nevertheless, I hope that I have been able to give you some insight into the conduct of airborne electronic reconnaissance. While I have confined my remarks largely to the first half of the Cold War, I should stress that the role was not confined to that period of history. I began by quoting Air Cdre Addison's observation on the critical work done by his specialist units during WW II; despite the demise of Communism, that work continues today.



*Successor to the Comet, No 51 Sqn has been operating the Nimrod R.1 since the early 1970s.*

## PHOTOGRAPHIC RECONNAISSANCE OPERATIONS

### Group Captain Philip Rodgers



*Phil Rodgers flew Victors with No 543 Sqn, and Canberras with Nos 85 Sqn and 13 Sqn before qualifying as an imagery analyst.<sup>1</sup> As such, he returned to Malta to support the resident squadrons in their tactical and maritime reconnaissance roles. During a stint at the MoD he was responsible for the co-ordination of tasking for the Joint Air Reconnaissance Intelligence Centre (JARIC) and acted as Secretary to the Joint Air Reconnaissance Intelligence Board. Following a tour at Gütersloh, supporting the Harrier Force, he became OC Ops Wg at JARIC before rejoining the DIS in London, eventually ending his career at Ramstein with HQ AAFCE.*

By the time that I had reached my first squadron, the Cold War was into its 15th year. But another twenty-five years were to elapse before that phase of modern history was deemed to be over. During that same period my career was almost entirely devoted to the collection and exploitation of imagery, so my contribution to today's proceedings will be to review those years and to describe some of the developments and changes in strategic and tactical reconnaissance, as I perceived them at the time. But before I do so it is only right that I should acknowledge the formative events, which took place during the 1950s and early 1960s.

To all intents and purposes a watershed occurred in March 1950 when Coastal Command's Central Photographic Establishment was disbanded, control of its Benson-based reconnaissance squadrons being transferred to No 3 Gp of Bomber Command. Later that year Benson hosted a major conference at which Cold War collection priorities were discussed and determined. This event was attended by delegates from the Admiralty, the War Office and the Air Ministry, together with representatives from the armed forces of Canada and the

<sup>1</sup> For those who are slightly longer in the tooth, it should perhaps be noted that today's 'imagery analysts' are the lineal descendants of the 'photographic interpreters' of yesteryear – Ed.



*The Mosquito PR 34 was the RAF's main reconnaissance type in the early years of the Cold War. This one belonged to No 540 Sqn.*

United States. It was agreed that the primary tasks of photographic reconnaissance operations would be to provide evidence of the Soviet Union's potential to use long range aircraft to attack the UK and to provide proof of its ability to use submarines against surface ships. It was also required to detect and report on the movement of Russian land forces in Eastern Europe. Other tasks included the conduct of air survey, to update existing maps and to produce a new series of target maps for the support of a future strike force. To achieve their primary objectives, reconnaissance aircraft would have to enter Soviet airspace, in direct contravention of international law. In the interest of national security, however, the USA and the UK resolved to accept the risks involved and there was a marked increase in overflights of East European countries in early 1951.

Meanwhile, in the Far East, things were going badly for United Nations forces in Korea. China had joined the North Koreans in the launch of a major offensive and President Truman wished to avoid the direct or indirect involvement of the Russians. He concluded that it was too provocative to continue to penetrate Soviet airspace and he banned any further American participation in the programme. This decision inevitably resulted in an overall reduction in collection capability and an increase in the risk for the RAF, because the Russians could now focus their fighter interception efforts on British aircraft, which lacked the performance of their American counterparts. The Mosquito PR 34 was supposed to be replaced by the Canberra PR

3 but the in-service date had been delayed and it would be at least a year before crews were sufficiently well trained to be operationally effective on the new type. So, as a stopgap, the Americans offered to equip a Special Duties Flight with the RB-45C Tornado. With its four turbo-jet engines, the RB-45C was able to fly higher and faster than the Mosquito. It also had the considerable advantage of being equipped with AN/APS-23 radar, an invaluable source of information which would later be used in the production of specialised maps for the V-Force.

In August 1951, a small group of RAF aircrew was flown to the USA to be converted onto the B-45 before returning to operate from Sculthorpe, in Norfolk. Their first mission was in March 1952, when a high-speed high-level transit was flown through the Berlin corridor to test Russian reaction. Thereafter, collection flights over Russia were resumed and, according to recent accounts, the programme continued until the end of the year when flights were suspended, the crews returning to their original units until 1954.

On reflection, the prolonged secrecy surrounding the RAF's conduct of RB-45C operations speaks volumes for the integrity of those concerned and for the effectiveness of the 'need to know' policy. Despite my twenty-five years of direct involvement and close association with intelligence collection, I knew nothing of these activities until Humphrey Wynn's *RAF Nuclear Deterrent Forces* was published in 1994. (*Although there was no indication of their purpose, the existence of the RAF's RB-45s had actually been reported as early as 1953, cf pages 150 and 182 of Air Pictorial for that year and page 214 of 1954. A photograph was published in 1984, in John Rawlings' book The History of the Royal Air Force. Ed*)

The first Canberra PR 3 was eventually delivered to No 540 Sqn at Benson in December 1952. Although this variant was to serve with No 231 OCU for some twenty years, its operational career was much shorter, the squadrons all having been re-equipped with PR 7s before the end of 1955. The last of the UK-based units to receive the new mark was No 58 Sqn which was stationed at Wyton, together with the Valiants of No 543 Sqn, which moved over from Gaydon in November 1955. Both squadrons were closely linked with the V-Force, with the Canberras collecting photographs of the transit routes which were being planned for use by the strike force. This imagery



*By 1958 practically all Valiants will have been wearing anti-flash white, so this is a relatively early picture of one of No 543 Sqn's aeroplanes. The fact that its upper fin and outer wing panels are in 'Arctic' red suggests that it may have been one of the two Valiants which operated from Namao (see page 95). (MAP)*

was used for photographic mapping purposes and to determine, with the greatest possible degree of accuracy, the co-ordinates of the pre-planned radar fixes that would be used to update the inertial navigation system of the BLUE STEEL stand-off missile. Meanwhile, No 543 Sqn had been providing similar material and supplementing this with radar imagery to complement the work that had been done by the RB-45Cs, although cross-border incursions were no longer being carried out.

When I arrived at Wyton, in November 1965, No 543 Sqn was in the process of re-equipping with the Victor B.2(SR). Delivery had begun in May and the squadron finally reached its established strength of eight aircraft in the following April. To acknowledge the unit's return to full operational status, a Press Day was arranged for the 29th June. In comparing the Victor with the Valiant, the press release claimed that the new strategic reconnaissance aircraft had a better performance and more efficient photographic equipment than its predecessor. The range of the Victor was described as being 40% greater than that of the Valiant, its photographic coverage capability being more than doubled. The Victor could produce radar mapping of a 750,000 square mile area in about six hours. In a single sortie it could produce a radar-mosaic of the entire Mediterranean with



sufficient resolution to permit a precise count of all surface shipping.

On the Day itself I was a member of the crew which had been chosen to provide a practical demonstration of the Victor's capabilities. We were to fly to Malta, image the whole island from high level on a single photographic frame, descend and take low-level obliques of Valetta harbour and Luqa airfield, climb back to altitude and return to Wyton, all without landing or refuelling. Whilst this sortie provided a convincing demonstration of the Victor's range, the photographic element was hardly typical of routine tasking. For the most part the squadron was concerned with survey work for local agencies and for national and NATO governments.

This was relatively straightforward task, but even this could be complicated by the unexpected. On one occasion we were conducting a survey over West Germany, when we noticed what appeared to be a layer of lenticular cloud forming just ahead of us. At the same time the area controller casually informed us that a gunnery range was active. Putting the two observations together we suddenly realised that we were not looking at lenticular cloud, and that the gunnery must be surface-to-air! We were, in fact, flying directly into a carpet of *Flak*. Survey flights were no respecters of controlled or restricted airspace, and there was always a need for thorough planning. But there were many occasions when the best laid plans did not work out because of a lack of co-ordination.

One of No 543 Sqn's roles which had a more direct effect on the collection of intelligence was a logical extension of the Press Day claims about radar coverage of the Mediterranean. The task had shifted to the North Atlantic, however, where, instead of merely counting ships, the requirement was to know the identity and location of each one. The method for doing this had been worked out in the past by the squadron's Valiant crews, working in co-operation with Shackletons. Flying a castellated track at high level, the Victor was able to locate shipping using its radar. The radar responses were then plotted and their locations reported to maritime aircraft, which investigated the contacts, taking photographs and producing reports on any non-NATO shipping activity. Because we could direct them straight to the reported contacts, the Shackletons and Nimrods were able to avoid hours of fruitless searches over vast areas of open sea.

In addition to the collection of intelligence material through the use

of its cameras and radars, No 543 Sqn was directed to carry out reconnaissance of a very different kind. The first intimation came in the form of an external modification which looked like a ‘pudding basin’ and was fitted on the nose of the under-wing fuel tanks. Despite their robust appearance these were actually delicate sensors, which had been designed to take samples of the upper air in the aftermath of an atmospheric nuclear weapon test. The samples obtained from deployed locations around the world were brought back to the UK, where they were analysed by the scientists at Aldermaston.

Before we could fly any of these sampling missions, however, we had to overcome an operating problem, which involved a very low-tech solution. During initial trials it soon became apparent that the required samples were not being obtained because the sensors were not opening. The sensors were operated by electrical switches, but there was no electronic indication of their setting and their positioning precluded a simple visual check. During one of the trial flights my captain suggested that I should undo my harness and remove my helmet so that I could lean forward and look back from the cockpit window which was sited at waist height and to my right. This sort of antic on a ‘live’ ejection seat was not at all to my liking and the captain had second thoughts when I reminded him that he would have to do the same to check the sensor on his side of the aircraft. Instead, I



*A Victor B.2(SR) of No 543 Sqn. Note that both underwing fuel tanks have had ‘pudding basins’ added to permit atmospheric sampling for the analysis of nuclear fallout.*

suggested that we remove the mirror from the standby compass and this proved to be an effective method of achieving the required rearward view. Dismantling aircraft instruments in flight did not meet with general approval, however, and an alternative solution had to be found. So it was that, in the middle of the nuclear age, in Britain's most prestigious reconnaissance aircraft, nuclear sampling was conducted with aid of toy from a budgerigar's cage!

This was not the only example of high tech being underpinned by low tech in the reconnaissance world, as I discovered when I moved to Malta and onto tactical reconnaissance in the Canberra PR 9s of No 13 Sqn. With the efficiency of air defence systems having been considerably improved, the unauthorised overflight of foreign airspace was no longer viable and clandestine activities had come to rely on cross-border surveillance using long-range oblique photography. To a great extent the correct stand off could be planned and plotted as a track over the ground. But this technique was difficult over featureless terrain, and impossible when flying off the coast. What was needed was a sightline for the pilot. For vertical photography the navigator used a modified bomb sight, but there was no comparable option for the pilot in the form of a modified gun sight. Instead, he had to use a strip of adhesive tape stuck to the cockpit canopy. This was usually positioned after he had climbed aboard and adjusted his seat, so that his lateral line of sight could be made to coincide with the lens axis of the camera. This was achieved by simulating a target line, using a tin can attached to a piece of string which was carefully measured out in the dispersal. With the adhesive tape suitably attached to the perspex, the switch-on and switch-off points could be 'carefully' calibrated using the span of an outstretched hand. It was a crude, simple, but



*A Canberra PR 9 of No 13 Sqn at Luqa in 1972. (MAP)*

very effective scheme which has stood the test of time, because the adhesive tape can still be seen on the PR 9 today. The sightline not only ensured that the correct stand-off would be achieved: it also enabled adjustments to be made to the aircraft attitude, so that coverage of the target would appear in the optimum position, ie one third of the way up the frame of the photograph.

This sort of surveillance work was a regular feature of squadron operations, as was survey, with some additional tasking on the Soviet fleet in the Mediterranean. The latter involved a reversal of the maritime reconnaissance role as I had previously practised it on No 543 Sqn. Now it was the Nimrod which flew to distant anchorages, while the Canberra did the close-up investigation of selected surface combatants, using a range of cameras to reveal details of the ship's structure, its deck cargo and its aerals and armaments. Operating at low-level, as we were, it was somewhat disconcerting, and by no means uncommon, to see the ship's guns being panned around to track the aircraft on each pass.

Because of the improvements to air defence systems to which I have already referred, flying at high speed and very high level no longer offered a worthwhile degree of protection and reconnaissance operators were obliged to emulate the low-level tactics being adopted by attack aircraft. But low-level operations restricted both range and the field of view and by the end of the 1970s the future of reconnaissance within the RAF had reached something of a crossroads. Some planners favoured the exploitation of satellites. An independent space-based capability was simply not an option, however, although, in the fullness of time, images of a useable quality would become available commercially. Others looked towards an enhanced stand-off capability. Here inter-Service wrangles over 'ownership' were to contribute to the long delays that have preceded the ordering of ASTOR (the Airborne STand-Off Radar system). So, the Canberra soldiered on and, despite early opposition which resulted in the loss of a proposed pod-mounted, multi-sensor capability, work continued on the development of a reconnaissance variant of the Panavia Tornado.

The cancellation of the pod-mounted system was to have echoes within the Harrier force. Whilst supporting the reconnaissance activities of No 4 Sqn at Gütersloh, I developed a great deal of respect

for the GR 3 as a fighter-reconnaissance platform. In combat it would undoubtedly have been a success in the corps-level battle, with a rapid and reliable response rate. But carrying the reconnaissance pod degraded its range, and it was to be replaced in the GR 7 by a miniaturised version of the infrared linescan system which had by then been adopted for the Tornado. This was a most disconcerting development for the imagery analysts, because, while a low-low profile clearly enhanced the Harrier's survivability, it also limited its photographic coverage to narrow strips of terrain. We were therefore unable to examine large military formations, and we needed to be able to do this, since the identification of military units relied on our ability to recognise individual vehicles or the tell-tale signatures of specific equipment. The proposed infrared linescan system would simply not have provided the necessary degree of resolution. As a result, the project had to be abandoned.

While the Harrier may have ended the Cold War without a reconnaissance capability, the RAF still had Nos 2 and 13 Sqns, by now flying the Tornado GR1A, and the Canberras of No 39 Sqn. It also had the Jaguar, with its pod-mounted installation, although this falls outside my personal experience. No sooner had the Cold War ended than a hot one began and, while the reconnaissance forces were deploying to the Gulf, I reflected on a comment which had been made when I attended a Junior Command and Staff Course some 20 years earlier. A presenter had been somewhat critical of the substantial cost of the recently acquired Phantom reconnaissance system, together with Moveable Air Reconnaissance Exploitation Laboratories, Air Transportable Reconnaissance Exploitation Laboratories, some new rapid photographic processing equipment and the new semi-automated Vinten Light Tables. "Now", he proclaimed, "we can see everything that the enemy is doing, but we can't afford to do anything about it!" On the other hand, as I sat at my MoD desk in 1990, helping to arrange the deployment of that same equipment during Operation GRANBY, I considered that the reconnaissance planners of the 1960s had been very wise to invest in mobile exploitation assets. Because, thanks to them, we would still be able to 'see everything the enemy was doing', and we were very definitely also going to do something about it.

## AIRBORNE SENSORS AND TECHNOLOGICAL DEVELOPMENTS IN IMAGERY ANALYSIS

### Group Captain Geoffrey Oxlee and Wing Commander David Oxlee



*Geoffrey Oxlee joined the RAF in 1954 as an imagery analyst. He later served with No 58 Sqn at Wyton, No 39 Sqn at Luqa and as an exchange officer with the USAF at the Armed Forces Air Intelligence Center at Lowry AFB. In 1969 he became an instructor at the Joint School of Photographic Interpretation (JSPI). After Staff College in 1973 he was appointed as Staff Officer to Air Cdre (Int), subsequently holding appointments within the DIS and at JARIC, which he eventually commanded. Geoffrey retired from the RAF in 1987, establishing the Kalagate Imagery Bureau in 1990 to provide forensic imagery analysis services to police forces and the legal profession.*



*David Oxlee trained as an imagery analyst in 1954. He subsequently saw active service in a number of campaigns including Suez, Malaya, Cyprus, the Falklands and the Gulf War. Whilst with the military he worked for a number of years on strategic imagery analysis at JARIC, including a stint as Wg Cdr (Ops) in the mid-1980s. He has also worked extensively with tactical reconnaissance squadrons equipped with Hunters, Canberras, Phantoms and Jaguars. During his RAF service he commanded the JARIC in the Near East and the JSPI. On retiring from the RAF in 1984 he joined the Civil Service and was appointed Senior Intelligence Officer at JSPI, part of the Defence Intelligence & Security Centre at Chicksands. He retired recently and now acts as a specialist consultant with the Kalagate Imagery Bureau. He is the Chairman of the ACPO-recognised Forensic Search Advisory Group.*

### **Introduction**

This presentation will focus on the analysis of imagery from air reconnaissance and deals with the UK's contribution to the Western

alliance during the Cold War. It is a two-man presentation and, in addition to providing details of the contribution made by British imagery analysts, it will cover aspects of the development of sensor systems and data processing. While the previous speaker dealt with some of the key RAF air reconnaissance operations, we shall concentrate on the ground environment.

First some terminology. Although the boundaries are somewhat blurred, the terms ‘tactical reconnaissance’ and ‘strategic reconnaissance’ were widely used during the Cold War period, the differences generally being reflected by the different organisations involved. We should, however, define two specific terms that we shall use this afternoon. ‘Strategic imagery analysis’ refers to third phase readout from recce missions while ‘tactical imagery analysis’ refers to first phase reporting.<sup>1</sup> The latter is usually completed at the operating base of the aircraft or platform while the former is completed at static centres or HQs. We will look at sensor systems, imagery processing and imagery analysis

### **Tactical Sensor Systems**

Tactical systems have their origin in the support of land forces, army co-operation being a key role for aircraft from the earliest days. Operating at low-level became increasingly necessary in order to survive, particularly in the context of attempting to penetrate the sophisticated defence environment of the Warsaw Pact

Tactical systems developed by the UK included the F95 very high-speed multi-frame photographic camera system. In order to compensate for the blur that would otherwise be caused by the high ground speed of the aircraft, special image motion systems were designed to ensure that the film moved across the photo plane at a rate equivalent to the aircraft’s ground speed.

Typically the aircraft would have a multi-camera system providing horizon-to-horizon cover. Very good clarity was achieved with the

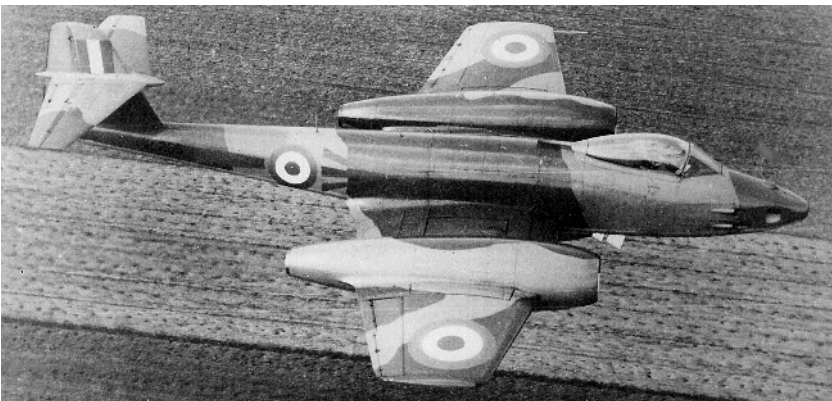
<sup>1</sup> For the benefit of those who are unfamiliar with the recce business, some indications of what is (or was, these terms now being somewhat dated) meant by ‘phases’ may be helpful. First phase analysis is conducted at unit level, amounting in essence to a ‘hot debrief’, focusing on the briefed target(s). Second phase analysis, which may be carried out at a higher level within the hierarchy, covers the content of the entire mission. Third phase analysis is a longer term affair, involving in-depth study using sophisticated techniques at units like JARIC.

F95 and coverage of all twenty-six NATO target categories was feasible. Broad recognition requirements could readily be satisfied and it was also possible to provide positive identification of a specific type and model of military equipment. Thus intelligence ranging from Order of Battle studies to technical data could be produced.

As with all photographic reconnaissance there is a trade-off between truth and timeliness. All operational users tend to demand ever greater detail in shorter and shorter response times. Without a real time downlink from the aircraft to a ground station, however, these two things are pretty well mutually exclusive. Moreover, the requirement for more detail increases in direct proportion to advances in spatial resolution of the available systems.

Operating at night was too hazardous to be a sensible option during the early years of the Cold War. At the time it was necessary to provide artificial illumination, which was hazardous in itself, as it also illuminated the aircraft. Furthermore, in the context of low-level operations, they generally proved to be ineffective.

The need for night photography was eventually met by the infrared (IR) systems which were developed in the 1960s. These were mainly infrared linescan (IRLS) devices which produced an IR raster scan of the ground beneath the aircraft. A typical system comprises an array of solid-state elements that can sense the IR radiation emitted by anything, so long as its temperature is above absolute zero; which means *everything*. The intensity of this radiation is governed by the



*The RAF's tactical reconnaissance platform for the early 1950s was the Meteor FR 9; this one belonged to No 79 Sqn.*



object's temperature and its 'emissivity', the latter being its capacity to absorb and emit heat. The radiation intensity from any object is equal to its emissivity value times its temperature to the fourth power. In other words, temperature is the dominant factor.

Since we cannot see IR radiation the linescan system converts the signal to light, the hotter the object the brighter the light. It is then a relatively simple matter to record the light and dark tones on photographic film or to display them on a monitor.

IR systems provided a successful means of conducting reconnaissance at night but, since the results were a portrayal of a pattern of IR energy, special training for both aircrews and, particularly, imagery analysts had to be developed at the JSPI. Spectacular results were obtained against camouflaged targets, the activity patterns revealed by the IR signals providing supplementary intelligence.

The Sideways Looking Airborne Radar (SLAR) developed for the multi-sensor reconnaissance version of the Phantom also provided a night capability. The use of radar recce systems was necessary to offset the poor bad weather performance of IR systems, thermal radiation being severely attenuated by cloud and rain.

The first SLARs used real aperture antennae, the RAF, in conjunction with the Royal Signals Research Establishment (RSRE) at Malvern, having been at the forefront of the development of this



*Micro-miniaturisation permits modern IRLS equipment to be packaged neatly within the airframe. The only obvious clue to the fact that this Tornado of No 2 Sqn is a recce-rolod GR 1A is the small window on the lower fuselage just aft of the nosewheel. (MAP)*

technology from the earliest days of radar recce. The resolution of a real aperture radar is a function of its wavelength and the length of its antenna. Unfortunately, therefore, small tactical aircraft, capable of carrying only a relatively small antenna, were unable to produce imagery of sufficient resolution to provide meaningful results. Until synthetic aperture systems were developed, therefore, tactical reconnaissance radar was allowed to wither on the vine.

### **Strategic Sensor Systems**

From the beginning of the Cold War period, the UK continued to develop the strategic high altitude sensor systems and interpretation techniques that had been established during WW II. Long Range Oblique Photography (LOROP) was deployed to meet the requirement for border surveillance operations conducted from aircraft flying over international waters. Precision long focal length lenses were produced in order to obtain the resolution needed for detailed imagery analysis. In addition, special fine grain aerial film was manufactured to provide high resolution at small scales. This film was wound onto large capacity film spools capable of providing hundreds of miles of cover per sortie.

A typical LOROP system used the F96 camera. This had focal length options ranging from 6" to 36" and could provide ground resolutions of a few feet at distances of 12 miles or more. Ground resolution is measured as the distance apart that two objects need to be in order for them to appear on the imagery as two objects. In other words if a picture has a ground resolution of two feet, then objects have to be two feet or more apart to be distinguished. LOROP permitted us to detect and identify military equipment but the imagery also allowed analysts to produce detailed reports on military bases, factories and other establishments, thus contributing to Scientific and Economic, as well as to Military, Intelligence.

As in the tactical case, strategic recce at night proved too difficult to achieve. Systems based on the use of flash cartridges or flares were developed, of course, but they were not taken seriously because of the high risk of attrition. Typical of these systems was the F97, which underwent trials in Canberras and recce variants of V-bombers. The lack of a realistic night reconnaissance capability provided potential enemies with substantial time windows during which they could, for

instance, conduct R&D trials of new equipment without the fear of overhead or stand-off surveillance. Fortunately, relatively little advantage seems to have been taken of these opportunities, probably because it is difficult to carry out such work in the dark.

The value of radar imagery was shown during the very early days of over-flights. The aircraft involved used both conventional photographic and radar sensors. The recording of radar images was achieved at first by the simple expedient of filming Bomb/Nav systems using photographic cameras.

In addition to its value as the only all-weather sensor system (and it should be remembered that for well over 200 days per year most of the potential targets were cloud covered) radar can provide valuable evidence of activity. Recce radars normally have a Moving Target Indicator (MTI) capability which can reveal, for instance, the direction of movement and strength of convoys or armoured columns.

### **Tactical Imagery Processing**

The advent of low-level systems, and the need for NATO interoperability to provide deployment options, underwrote the requirement for mobile processing and interpretation centres. These included Mobile Field Photographic Units (MFPUs). The first systems to be employed were collections of semi-permanent buildings or trucks with bespoke box-bodied trailers. With deployed operations becoming increasingly commonplace and aircraft being equipped with



*Beginning with the Phantom in the 1970s, tactical recce equipment began to be carried in pods, rather than being integrated into the airframe as had been the practice with Spitfires, Meteors, Swifts, Canberras and the like. This podded Jaguar belonged to No 41 Sqn.*

podded recce equipment, purpose-designed cabins, Air Transportable Reconnaissance Exploitation Laboratories (ATRELS) and Moveable Air Reconnaissance Exploitation Laboratories (MARELS), were introduced.

ATRELS and MARELS housed equipment capable of very fast wet processing of high-resolution film. In addition, motorised light tables facilitated rapid imagery analysis. Such analysis had to be performed under all conditions, including a hostile NBC environment, with hot reports produced within a NATO standard of 30 minutes from engines off.

ATRELS and MARELS also housed facilities for the rapid debriefing of aircrew. The identification of targets and 'reading' the imagery as quickly as possible was, and still is, very much a team effort, involving both imagery analysts and aircrew. To facilitate this interchange multi-strand processing and light tables were developed and deployed. Training our aircrew to carry out in-flight and post sortie debriefs, incidentally, produced results of the highest quality. There is little doubt that RAF crews were the *crème de la crème*, both in the operation of their camera systems and in their verbal and written reporting.

In addition to high speed processing, imagery enhancement systems became available to analysts at their workstations in the later years of the Cold War. British imagery analysts were trained to interpret from negatives in order to save time. (Although I must stress that the rumour that they all had negative attitudes was totally without foundation!)

The transmission of data to the users was the biggest headache but laudable times were achieved, sometimes using WW I-type comms technology. I will mention, once again, that all of this high speed activity had to be carried out under NBC conditions, and viewing film through protective clothing is definitely no joke.

Not to be forgotten is the part played during this period by No 7010 Flight, RAFVR. These excellent reserve officers, who operated as imagery analysts, devoted many hours of their own time to keeping abreast of developments in interpretation techniques. Although they were never found wanting during exercises, their efforts have too often been overlooked and gone unremarked.

## **Strategic Imagery Processing**

The commencement of strategic overflights and LOROP operations brought with it the development of ground support systems within the major permanent strategic interpretation centres. These included interactive processing at high speed of large-volume photography, requiring the development and deployment of special machinery.

Because speed is important in strategic intelligence and because the imagery involved was small scale (albeit high resolution) a means of rapid enlargement also had to be developed. Some of the optical enlargers installed at strategic centres were enormous, filling several large rooms.

Stereoscopy (3D vision) was vital if detailed military, scientific and technical questions were to be answered. Almost invariably therefore the ability to take stereo pictures was designed into the sensor systems. Stereoscopes that could be used with small-scale imagery (stereomicroscopes) were quickly brought into service. Anaglyphs and, later, vertically and horizontally polarised projection optics were also introduced, such facilities permitting groups of analysts to see the target data collectively in three dimensions.

Other specialised imagery enhancements were needed, the RAF's photographic engineers developing many advanced processing applications. Among these was the process of density cutting, or 'contrast stretching'. Monochromatic (black and white) imagery is considered to contain up to 246 grey scales (ie shades of grey between black and white), although the unaided human eye can sense only about twenty of these. Contrast stretching permits parts of the photograph that would otherwise not be apparent to be seen by the observer.

Measurement is, of course, a key factor in the identification of equipment. For example, there is a difference in overall size between the nuclear and conventionally armed versions of the Soviet Scud missile. Exploiting techniques that had been available since before WW II, high precision photogrammetric machines called stereo comparators were developed which could measure accurately in microns (or as they are now called micrometres). While individual imagery analysts were equipped with precision measuring microscopes for on-line workstation measurement, skilled photogrammetrists from the survey branch of the Royal Engineers

were sometimes called upon to assist in certain complex tasks.

From 1970 onwards the development of the microchip, and with it high resolution scanning, enabled digital enhancement to take place. The filters used gave further improvement in the detail available and they were much faster. This allowed imagery analysts to set optimum parameters on their light tables for each task, which was essential in order to satisfy the demand for increasingly detailed intelligence.

During the early days, the degree of resolution of strategic imagery allowed only a broad analysis to be made. This might include, for example, no more than the determination of the general pattern of road and rail communications. As new systems were deployed, however, and film resolution improved the analysis could focus on individual bridges or buildings. With further improvements, users would want to know more about a specific part of the structure. A customer might want to know, for instance, whether a building has a clock. Then they would want to know the time on the clock and then, perhaps, the name of the clock maker, and so on! In other words, as the resolution provided by the systems improved, so the questions asked became more detailed. To some analysts this began to look like a never-ending process, as indeed it was! Nevertheless, digital enhancement did provide the tools to permit them to satisfy these demands.

### **Tactical Imagery Analysis**

Most of the deployed tactical centres concentrated on training for war in Europe, although these facilities could quickly be made operational to deal with a crisis elsewhere. Much data can be extracted from imagery recorded during tactical recce sorties and the squadrons involved are a vital element in the UK's armoury. The conflicts in the Falklands, and especially in the Gulf, underlined the importance of tactical recce. It is a sad fact however that in times of economic cutback air reconnaissance is the Cinderella and takes a back seat to the ugly sisters, 'Bombs' and 'Bullets'.

The need to operate at lower and lower heights led to the development of new imagery analysis techniques. Measurement was a problem because of the long drawn out trigonometrical methods used traditionally for scaling oblique photography. Displaying considerable ingenuity, however Flt Lt Ron Alderton, devised a quick method of scaling. Using data provided from the aircraft and sensor systems he

compiled a formula that permitted analysts speedily to determine accurate scaling and measurements while working at their light tables. This technique is, quite rightly, known as 'The Alderton Method'.

As an example of the sort of intelligence that could be gleaned by imagery analysts and to underline the importance of photogrammetry, consider a typical electronics site. The measurement of antennae can provide a wealth of data. The size of a reflector dish, and the dimensions of the waveguide that feeds it, is an indicator of its range and frequency spectrum. On yagi arrays, the active element is positioned at a specific distance from the reflector, this distance being proportional to the wavelength of the energy transmitted or received. In order to extract information of this nature, of course, it is necessary to be able to measure the details shown in the imagery, hence the need for extreme precision.

The comprehensive training of imagery analysts (IA) was something of a challenge for the Joint School of Photographic Interpretation. Qualified IAs had to have a detailed knowledge of all twenty-six NATO target categories and this could be provided at the initial stage. The speed with which existing weapons systems were further developed, and new ones introduced, however, made it impractical for the school to provide refresher training and this was done in-house, for both IAs and aircrew. With the combination of excellent basic training provided by the JSPI and on-the-job continuation training at squadron level the challenge was met, the RAF's tactical air reconnaissance force gaining and maintaining a well-merited reputation for excellence.

### **Strategic Imagery Analysis**

Strategic Imagery Analysis is such a vast subject that we can only scratch the surface in the time available. The RB-45 sorties flown in the very early days provided invaluable intelligence in the context of target selection, weapon selection and route planning. Other overflight missions carried out by Canberras provided clear vertical photographs. From such pictures the status of targets could be analysed. Moreover, they provided essential intelligence for military, scientific and economic purposes

Using the results of both overhead and border surveillance, and the RB-45s' radar photography, terrain analysis studies were made and

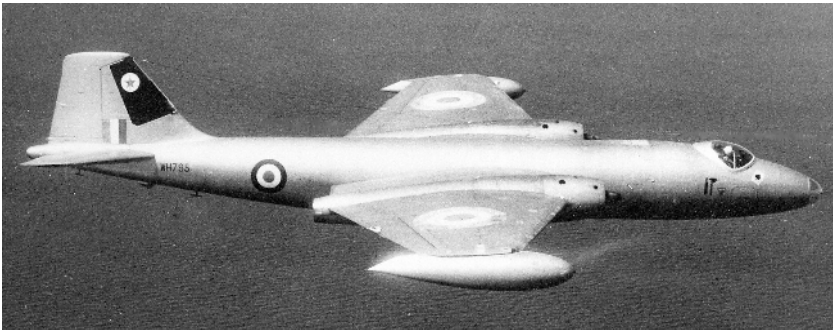
from these it became possible to refine the techniques of radar prediction. That is to say, the ability to determine in advance which features were likely to show up on a V-bomber's H<sub>2</sub>S display for use as en route fixes and offset aiming points.

Extensive overhead and LOROP coverage of East Germany was obtained by aircraft transiting the air corridors into Berlin. This enabled imagery analysts to produce both first and second phase analysis of the nature and structure of Warsaw Pact military units. Here I would pay tribute to the sterling work of the Pembroke crews who achieved splendid results sortie after sortie, and it is worth emphasising that the pictures they recorded were of the Warsaw Pact formations nearest to our own forces.

Training flights within the Berlin Air Safety Zone yielded similar results, some quite remarkable close ups being taken from the Chipmunk. After being studied by intelligence staffs at HQ RAFG and MoD, these picture were further exploited in the strategic interpretation centres. They often provided vital pieces of the jigsaw and yielded invaluable data on the Order of Battle and on the development of equipment

Border surveillance, mainly employing LOROP, was also conducted extensively in areas outside the European theatre. Operations of this nature were carried out in the Near East, the Middle East and the Far East, yielding first and second phase data of interest both to military commanders and to regional political analysts.

Most of the third phase work, and some of the second phase work,



*FEAF had its own JARIC which would have been served by the Tengah-based Canberra PR 7s of No 81 Sqn.*



was completed in strategic interpretation centres. As a result, during the early part of the Cold War, in addition to the more familiar JARIC in the UK, there was one in the Near East and another in the Far East while the facilities available at HQ RAFG amounted to a fourth.

Maritime reconnaissance flights obviously played a crucial role in the collection of intelligence on the increasingly powerful Soviet Fleet. Imagery analysts were able to determine a wide range of data relating to weapons systems and electronics, especially those which had been installed during a refit. Furthermore, constant monitoring, revealed tell-tale patterns in the way that Soviet and other Warsaw Pact navies operated while at sea.

The Soviet merchant fleet was extensively used for military purposes and analysis of photographs of these ships was rewarding, as they often carried military equipment as deck cargo. A technique was developed by UK imagery analysts to enable the identification of covered equipment. Known as 'crateology', this technique facilitated the identification of military equipment being exported from the USSR to Third World countries. Crateology showed its worth many times but the classic example was in 1962 when it provided evidence of missiles on Soviet freighters on their way to Cuba.

Strategic intelligence is essentially a team effort between the all-source analysts and the imagery and other source-specific analysts who, together, require a wide range of detailed information about complex subjects. Perhaps the best way to demonstrate the quality and quantity of the information gathered from strategic reconnaissance is to consider a hypothetical strategic intelligence problem and then to consider what sort of imagery might be required to answer the associated questions.

Let us assume that we want to know how many nuclear weapons a particular unfriendly country could produce. Many factors would have to be considered and fed into the equation before drawing any conclusions. One of the key goals would be to determine the amount of fissile material such a country might be able to produce internally. One way to manufacture fissile material is in a uranium isotope separation plant. A common method of isotope separation is by gaseous diffusion; another is gaseous centrifusion. Both require plants with vast buildings, because there are many stages of enrichment and it is essential to avoid creating a critical mass. As a result, the cells

handling each successive stage of the process become progressively smaller, but more numerous, as the mixture gets richer in the fissile isotope and depleted in the non-fissile isotope. Moreover, there are stripping stages to recycle depleted materials. The energy needed to produce vacuum pressures necessary for the diffusion process, or to drive the centrifuges, is very large so copious quantities of electric power are consumed in the process.

To identify a potential isotope separation plant, imagery analysts would look for industrial establishments having buildings with very large floor areas. Such a plant would have to be located near water to provide the necessary cooling and there would have to be large transformers and substations fed by high voltage power lines.

The amount of enriched fissile material is proportional to the amount of power consumed. It would be necessary, therefore, to make a quantitative assessment of the electrical facilities. The amount of power consumed is, in turn, proportional to the amount of cooling water used, so cooling towers would be measured and their capacity determined. Unfortunately, however, many countries outside the Western World show little concern over feeding hot water directly back into their rivers or lakes, so cooling towers may not be present after all.

Incoming power lines are usually carried by pylons, of which there are two basic types. The most common are transmission towers that simply support the wires. The second type are tension towers which take the strain when the cables change direction or span a large gap, perhaps a river. To an imagery analyst, tension towers are the key since these have horizontal insulators which means that they can be measured. Put crudely, the size of the insulators indicates the maximum voltage that the line can transmit but deeper analysis of their shape and of the characteristics of the transformers and the type of switchgear within the associated substations will build up the picture of the overall power handling capacity. None of these factors will provide a definitive answer in isolation; the more factors examined, the more precise the analysis becomes.

Knowing the capacity of the electrical system is only half the story, however; we also need to know the periods during which they are operating. This too is a complicated question but, I would just remind you of the nature of IR radiation. Since heat is a by-product of the

generation and consumption of power, you can see that IR sensors would have a role to play in determining the level of activity.

The message is that, in the aerospace reconnaissance business, whether it be at the strategic or the tactical level, a multi-sensor fit is needed to provide imagery from which a complete picture of quantity, capacity and activity can be deduced. In intelligence, the whole is truly greater than the sum of the parts.

### **The Human Computer**

Throughout the Cold War, and since, there have been remarkable advances in computer technology. These have contributed a great deal to the speed with which we can process the raw data provided by reconnaissance systems. One lesson that we have learned, however, is that the computer cannot match the analytical skill of the human brain, particularly its memory. Despite a great deal of effort, we have yet to design a computer that will provide reliable automated recognition of even simple objects, let alone complex military equipment. For intelligence analysis therefore, man remains the most useful computer of all. It will be many years before we have a machine that is able to match our analytical skills; it may never happen.

### **Space**

We were asked to say a few words about reconnaissance from space, much having been written about both US and Russian activities. The Americans, for instance, have released a great deal of information relating to the early *Corona* system that took the place of U-2 overflights once the USSR had demonstrated that it had an effective counter to that programme. Following the Soviet rejection of Eisenhower's 'Open Skies' proposals, satellites were used to photograph vast areas of hitherto unseen territory within the USSR (and elsewhere), permitting detailed analysis of Soviet progress in military, economic and technical affairs.

The initial drive was to assess the threat to the West represented by Soviet medium and long range aircraft and missiles but, because it takes a long period to counter a new threat, it was also important to monitor both R&D activities and production facilities. The scale of the task was daunting but, faced with no alternative, the USA invested heavily in satellites, sensors and exploitation facilities.

Pictures, illegally obtained and supplied to Janes a few years ago,

such as the one of a Soviet aircraft carrier under construction, showed that even then the resolution available from sensors mounted on a platform more than 100 miles up was truly remarkable. Interestingly, the latest civil satellites provide better resolution than the original *Corona* missions and the resolution of new systems improves constantly as the world demands more data about the Earth's environment.

Nevertheless, despite their remarkable capabilities, satellites are not the panacea. All too often they are not in the right place at the right time. By their very nature, reconnaissance satellites are polar orbiters that pass over specific targets only once every few days and, because their perigees are optimised for the northern hemisphere, they do not provide 100% cover. Furthermore, they cannot always produce the required resolution, particularly when the weather over a target prohibits the use of optical systems. Although reconnaissance satellites will continue to be developed and their sensors will become more and more sophisticated and cover more and more of the electromagnetic spectrum, even with real time downlinks, the fundamental problems of time and place inherent in polar orbiters will remain.

Various crises during the Cold War years, and our own experience during both the Falklands conflict and the Gulf War, revealed only too well the deficiencies in satellite systems and thus reinforced the continuing need for both strategic and tactical air-breathing systems.

### **Conclusion**

By comparison with USAF activities, the RAF's strategic air reconnaissance effort during the Cold War period was small. The results achieved, however, were of the highest quality and, by producing high grade intelligence, British imagery exploitation and all-source analysis did make a significant contribution to the credibility of the West's deterrent posture. In the tactical arena, British air reconnaissance systems and exploitation facilities repeatedly demonstrated their excellence in NATO competitions and evaluations. Maintained at high states of readiness, the air and ground personnel involved played their part in denying the Warsaw Pact the element of surprise.

## AFTERNOON DISCUSSION PERIOD

**Joe Owen King.** What role did MI6 play? How did they fit in?

**Gp Capt Phil Rodgers.** The only comment I would offer is that, within the intelligence community, MI6 were ‘customers’, just like any other department. As such, they would offer whatever advice they could, but that would not come down to unit level, other than via a tasking objective.

**Wg Cdr David Oxlee.** No intelligence source stands alone. Within the intelligence community every agency, whether it is a customer or a contributor, participates to some degree in the analysis.

**Gp Capt Geoffrey Oxlee.** I think it is worth expanding on that a little, by taking a hypothetical case. Suppose that a new plant were being built in some unfriendly country and you wanted to know what it was for. Because it is a unique structure, its overall appearance, as revealed by imagery provided by aircraft or satellites, might not provide positive confirmation of its purpose. But, if we had photographs of the people going in and out, taken at ground level by SIS operatives or defence attachés, these might well reveal that a number of them were known to be nuclear scientists or technicians, which might provide us with the conclusive evidence we required. The point being that it is necessary to collate information from all available sources.

**Wg Cdr David Paton.** From the operator’s point of view. I have already alluded to the fact that, in the field of airborne electronic reconnaissance, one relies on ‘tip-offs’ about forthcoming events in order to ensure that you have your air platform in the right place at the right time. It is this sort of information that can often be derived from all-source analysis.

**David Oxlee.** You are clearly an advocate of the fourth type of intelligence, URINT - a feeling in your water! (Laughter)

**Morrison.** My generation of analysts used to be sent on a one-week course at the JSPI to learn the basics of photographic interpretation. This was both good and bad. The good thing was that it made one respect the capability of the professionals. The bad thing was that it encouraged some analysts, particularly on the technical side, to believe that they could do it all themselves; you simply asked for a 20

x 16 print 'and kindly don't bother me further!' Could the Oxlees tell us a bit more about the problems of 'selling' their capabilities to customers who might think that their job wasn't that difficult to do!

**David Oxlee.** I think that, in part, we contribute to the problem ourselves by our enthusiasm for the potential of imagery intelligence. This leads to exaggerated expectations which are picked up at a fairly senior level and passed down to the customer. Perhaps I could illustrate what I mean with an anecdote. I was once approached by the Minster for Technology, one Tony Benn, who had been told by one of our people that, if we got infrared cover of all military installations, that I, *personally*, could tell him how much energy was being wasted by the CO of each station! I had considerable difficulty trying to persuade him that this was not really practical, especially as he had picked up an American salesman's manual which said that it was.

In the course of trying to prove my point, incidentally, I selected the Pilkington glass factory as a case study. When I examined the images, I was surprised to find that one of their warehouses actually was considerably warmer, ie radiating more energy, than the other. I 'phoned the manager and asked him why this should be. It turned out that they had made some special glass for some Sheikh or other who had since been deposed. As a result, instead of being delivered, it had been stacked against the wall of the warehouse. In so doing they had covered up the radiator plumbing, including the valves which the watchman was supposed to turn off. The heating had been on permanently for about ten years! (Laughter). That may not answer the question entirely, but it does illustrate one of the problems in the imagery intelligence business. Salesman, and the press, tend to overstate the capabilities of the technology, and so do we!

**Geoffrey Oxlee.** When David and I started in the business in the 1950s, quite early in the Cold War, Photographic Interpreters, as we were then called, were measurers and identifiers of objects. All that the analysts in London wanted to know was an object's size and shape. They eventually realised that those of us who had been in the game for a long time had become experts in specific areas, nuclear energy, aircraft production or whatever, whereas the turnover elsewhere could be quite rapid, even among the Technical Intelligence staffs. This situation contained a substantial risk (one that is always

present in any sphere of intelligence) that, instead of interpreting all of the information, they would select only those aspects which tended to confirm a preconceived notion. This mental process has a name; it is called 'cognitive mediation' which means making the facts fit the case.

We imagery analysts claim that we do not suffer from this problem, because we take an entirely empirical approach. When examining a picture, rather than assuming what the object is, we will always ask very basic questions. What shape is it? What size is it? What shadow does it throw? And so on. Only then do we attempt to draw a conclusion. Some all-source analysts are not always as painstaking as this. On the other hand, we can sometimes overstate our case because we do not always have access to all of the information available to the analysts. The answer, of course, is that analysis has to be undertaken as a team.

**Herrington.** Rather than a question, I wonder if I could offer some thoughts to fill in a small gap in the history. Although much of what we were doing at Wyton back in the 1950's and 60's is now *passé*, at the time it represented a significant contribution to what we have been hearing about this afternoon. I was with the Radar Reconnaissance Flight (RRF) which worked, in conjunction with the Radar Research Establishment at Malvern, on the development of side-scan radar. When I arrived at Wyton I was surprised to find that they were actually locking the H<sub>2</sub>S scanner of our Lincolns so that, prevented from rotating, it acted as a fixed side-scan aerial. The received signal was fed into a Rapid Processor Unit called YELLOW ASTER. We could navigate by reference to the images developed by this equipment, of course, but, because it produced a permanent record, we could also pick up intelligence information, even while we were still in flight. The Canberras we had were equipped with BLUE SHADOW, which was a proper dedicated Sideways Looking Airborne Radar (SLAR).

We were doing a lot of other radar development work, including winter trials over northern Canada, primarily for the benefit of the V-Force. Operation SNOW TRIP involved two Valiants of No 543 Sqn and our own Canberras. We were based at Namao (Alberta), the aim being to produce material which could be used to familiarise V-Force

radar operators with the considerable seasonal variations in the radar returns from the sort of terrain that they might expect to fly over on operations and to assist JARIC in selecting the responses to be used for mission planning.

Another aspect of our work had some bearing on what Gp Capt Rodgers was talking about, as much of the equipment we were working on was destined for the Victor Mk 2. It had originally been envisaged that the Victor would enter service in the strategic reconnaissance role in its Mk 1 version. The aeroplane was late, however, so the task was eventually given to the Valiant. Nevertheless, the first three Victor Mk 1s to be delivered were allotted to the RRF at Wyton where development work continued. The aircraft were equipped with two, long-aerial, BLUE SHADOWS and the H<sub>2</sub>S scanner could be locked for side-scan. We soon found that the system had some limitations, however. For instance, while side-scan could certainly detect the presence of surface vessels, it was difficult to measure, let alone identify, them because the aspect of a manoeuvring ship changed, relative to the transmissions from the aircraft, so the returns were inconsistent. On the other hand, excellent results could be obtained against static targets, like airfields where it was sometimes even possible to identify the larger types of aircraft present, not something that could be done with H<sub>2</sub>S, of course.

To exploit this capability, the RRF flew a number of sorties over the eastern Baltic and the northern Black Sea to establish accurate fix points for V-Force mission planning. Interestingly, these flights were sometimes accompanied at a discreet distance by one of No 51 Sqn's aeroplanes, presumably recording the activity stirred up by the presence of a potential intruder flying close to the Soviet border. For Black Sea operations, for instance, I recall that the RRF Victors operated from Akrotiri, while the Comets were based at Nicosia.

Another device which we tried out on the Victor Mk 1, in conjunction with Malvern, was RED NECK which involved the fitting of an aerial under each wing. Since these aerials were some forty feet long, the system promised a very high-definition SLAR capability. Unfortunately, the aerials tended to flex in flight which corrupted the resolution of the picture. As a result, RED NECK never realised its full potential; it never became operational and the programme was cancelled in 1962.



The RRF's Victor Mk 1s also did a lot of trials on the camera crates which later went into the Mk 2. These crates proved to be quite troublesome at first, as the bomb bay doors had to be open to permit the cameras to be used; this caused turbulence which led to a good deal of unwelcome vibration. These problems were eventually solved, although the Victor's essentially high-level mode of operations was later abandoned in favour of low level photography and visual reconnaissance.

**Gp Capt Kevan Dearman.** I know that Sqn Ldr John Crampton is with us today and I understand that he has one or two misgivings regarding comments made since his fascinating talk to us at our last Intelligence seminar during which he outlined his experiences flying RB-45 reconnaissance sorties in the 1950s. The tale is as relevant to today's seminar as it was on the previous occasion and perhaps he would like this opportunity to put the record straight.

*The Chairman invited Sqn Ldr Crampton, who had prepared some notes in advance, to speak. This invitation was accepted and he addressed the meeting as follows:*

For the benefit of those who did not hear me speak at Bracknell in 1996 and who may not have read my Paper in our 1997 Journal, I will offer a quick recap. Three RAF RB-45C long range aircraft carried out deep penetration radar recce missions over Russia in April 1952 and again in April 1954. There were two principle objectives:

1. To obtain photographs of the airborne ground mapping radar displays of vital military targets, ICBM sites, etc.
2. To obtain, from ground monitors, Electronic Intelligence (ELINT) about Russian defences.

All the flights were carried out in copybook fashion. Take offs, in-flight refuellings and all of the routes were flown as briefed. The importance of adhering to the flight plans was vital. We had to fly strictly as ordered. We did.

Two years ago Mr James Gilbert, the Editor of the magazine *Pilot* sent me a copy of a book called *High Cold War* and asked me if I would review it. When I read the inaccurate and offensive remarks the author, Mr Robert Jackson, had made about the work of the RAF Special Duties Flight, I declined the offer, not wishing to give the

book any publicity whatsoever. Mr Humphrey Wynn did review it for the magazine *Air Pictorial*, and his review was reproduced on pages 112-113 of the Society's Journal Number 20. The book attempts to summarise RAF and USAF spy flights over Russia during the very Cold War of fifty years ago.

Mr Jackson said this about the RAF's RB-45C effort. I quote, "The intelligence material gathered during the whole series of overflights was far less than had been hoped for or anticipated. At best, the flights had given a small number of RAF crews experience of high altitude reconnaissance operations over hostile territory." Further, "It is surprising that the second series of flights, in 1954, had been authorised at all." His surprise is based upon a letter allegedly written in December 1952 by the AOCinC Bomber Command to a senior USAF general regretting, I quote, "that our first flights (in 1952) had not provided all the answers." We did have a technical problem in April 1952 but all three aircraft flew the required routes. Electronic intelligence, and photographs, were obtained. I knew nothing about this letter until it was mentioned in Jackson's book. Frankly I felt rather let down by it and wondered why Sir Hugh Lloyd had written it. Was it an answer to a letter from the general? We'll probably never know, but I would be very surprised if the CinC had said that the best that had come from our flights was 'experience of high altitude reconnaissance operations over hostile territory.'

Mr Jackson misleads the reader by writing that the first leg of my second sortie in 1954 took us towards Kiev where we met serious heavy *Flak* and so I turned and fled for home. Not so. In fact, having in-flight refuelled north of Denmark, heading eastwards, outbound, we cruise climbed and zig-zagged south-eastwards, photographing our targets as we proceeded until we were to the south-south-west of Moscow where we turned for the home run, still photographing, until we had to dog leg south towards Kiev to photograph more targets. It was then that we were very nearly hit by heavy predicted *Flak*. It was as if 500 anti-aircraft guns, 499 of which were armed with acoustic fuses in their shells, and one with a fuse set to detonate at our height, were fired from the ground simultaneously. When that lot went BOOM right in front of us, about 30 seconds flying time away, I was astonished. Clearly the Russians knew where we were, or very nearly where we were, when I was under the impression that we were

undetected and, anyway, we had been told at the briefing back at the ranch that the risk of *Flak* at our height and speed, was minimal. You can't trust anyone! There were no heroics; it would have been plain stupid to fly into that cloud of shrapnel. So we got out of that part of dark sky lickety split, to the acute disappointment of poor old Sanders, our navigator, who did so want to complete his photo runs. We had been a sitting target flying dead straight and level for photography for the past few hours and now I considered that it might damage our health if we continued with the operation. Meanwhile, the other two aircraft to the north of us were unmolested and returned home with all of their target photographs, good ones too, as were those which Rex Sanders had taken.

It is common practice among modern interpreters of military history to debunk anything that reflects well upon those involved. Mr Jackson's view that our RB-45C flights achieved very little seems at odds with those expressed by the commanding general of Strategic Air Command, and with those of the British Government of the time which approved decorations for all of the aircrew in the Special Duties Flight.

Finally Mr Chairman, perhaps I should tell you that I very nearly did not prepare this paper, thinking that it might be best if I were simply to let the waters close over this story in the hope that *High Cold War*, carrying its slur upon our activities, withers on the vine, even though its publication has damaged, and will continue to damage, the good name of our Service, both at home and overseas. But, my admiration and respect for the men I flew with prompted me, in the face of the book's adverse criticism of their achievements, to recall with pride the work they did often under difficult and dangerous circumstances during that desperate period of our history.

*On completing his short address, Sqn Ldr Crampton received warm applause. There followed a lengthy discussion, sparked by a question as to the extent to which senior politicians were aware that these B-45 missions were being flown. In the course of the ensuing debate the view was expressed that, in the interests of 'credible deniability', it might be preferable if politicians were never informed of unconventional operations. Among the topics covered was the extent of PM Eden's personal involvement in the Crabb affair of 1956*

*and the knock on effects of this, which probably included the termination of early U-2 operations from bases in the UK. While some participants were able to offer definitive information, much of what was said involved speculation on what were, in some cases, still potentially sensitive issues. Since it was not possible to draw any worthwhile conclusions (and because this section of the audio recording of the day's events was inadvertently erased), no attempt has been made to reconstruct this debate. Ed*

*In another contribution from the floor, **Flt Lt Maurice Rogers**, offered a recollection of what amounted to early LOROP operations in the Far East.*

With the withdrawal of the Sunderland in the mid-1950s, the Valetta was pressed into service to provide air-sea rescue cover from Hong Kong. Towards the end of my final detachment at Kai Tak my crew was summoned to the Ops Room for a special briefing which, it turned out, involved a photographic reconnaissance mission. The aircraft was to be flown at between 5,000 and 6,000 ft about five nautical miles inside the New Territories border so that photographs could be taken of the build up of Chinese military airfields. A very large camera had been installed on a ramp pointing towards the paratroop door on the port side of the aircraft. This door, which could be removed in flight, remained firmly in position until after take-off.

On reaching the required altitude and position, the port engine was stopped and feathered to prevent engine exhaust gases passing in front of the camera lens. The Valetta's single-engined performance was not good, particularly in a hot climate, so the entire exercise had to be flown with a gradual rate of descent. Visibility was excellent, however, and probably permitted photographs to be taken well over 30 miles into China.

## CHAIRMAN'S CLOSING REMARKS

And so we come to the end of what has been, I hope you will agree, a treatment of intelligence gathering by the Royal Air Force during the Cold War that has been unique. Unique in gathering together such a galaxy both of talented expertise and of hands-on experience. Unique too, perhaps, in managing to steer a steady course between the Scylla of platitudes and the Charybdis of the Official Secrets Act.

It would be quite impossible, even if there were time available, to sum up such a wide-ranging coverage of this subject. It will be enough I think if I say just this. Intelligence gathering by the RAF, whether conducted using cameras and electronic equipment of the highest technical specifications, or depending for its success on a water-soaked notepad in an East German wood, was remarkable. Remarkable in the very high quality of the operators; remarkable for its breadth and its depth; and remarkable in the contribution it made over the years to the Western Alliance.

You will, of course, have access to today's proceedings when they are printed in the usual way in the Society's Journal. Meanwhile, it occurs to me that some of you might be interested in further reading on this and associated subjects. First, there are our own publications, notably the Seminar on Photographic Intelligence during the Second World War that we held in 1991, Proceedings Number 10. Then there is a short article on the RAF Y Service in Volume 12 of the Proceedings; there is the Seminar led by R V Jones on the 'Intelligence War and the Royal Air Force' in the very first issue of Proceedings, dated 1987; and then there is the Symposium on Air Intelligence reported in the Proceeding of March 1996.

More on the Second World War experience is given in a book by Aileen Clayton, about the Y Service, called *The Enemy is Listening* published in 1981; and a fascinating and detailed account of the wartime work on Enigma is given by many of the operators in the series of monographs published by Hugh Skillen, all under the title of *The Enigma Symposium*.

More recent topics are dealt with by Tony Geraghty, in his book *Beyond the Front Line*, which deals with the work of BRIXMIS; and by Paul Lashmar in his book based on the TV documentary series

called *Spy Flights of the Cold War*. Percy Craddock who, among other distinguished posts, was Margaret Thatcher's representative on the Joint Intelligence Committee, has written about the British intelligence community and its role in Whitehall in his book *In Pursuit of British Interests*. Finally, there is a 1996 book by Mark Urban called *UK Eyes Alpha* which claims to lift the lid on the whole of the UK intelligence apparatus. Because I am still bound by the Official Secrets Act, I can neither confirm nor deny the accuracy of what Mark Urban says in that book, but I can tell you that its publication caused very serious rumblings in Whitehall!

It remains only for me now to thank the RAF Museum for kindly allowing us the use of these splendid facilities for our symposium; to thank all our speakers, who have done us proud in subjects that obviously call for some careful handling; and to thank Air Cdre Graham Pitchfork who fingered the speakers and masterminded the whole day. On behalf of everyone here, please accept our very warmest thanks.

## CHURCHILL'S BOMB PLOT

**Wing Commander J H Dyer MA**

*Wg Cdr Dyer was unable to attend the seminar but he subsequently submitted this very interesting written anecdote.*

Further to the recent seminar on Cold War Intelligence Gathering, members might be interested in the following recollections involving Prime Minister Winston Churchill, an unidentified East German construction engineer and myself. My predecessor at BRIXMIS, Hans Neubroch, and a member of the US Mission, Maj Matt Warren, had walk-on parts.

In the early 1950s I was AI3b(ii), a flight lieutenant desk officer at the Air Ministry, my responsibilities covering the Soviet Air Force in East Germany (24 Air Army) and the then emerging East German Air Force. In July 1953 I had occasion to alert my superiors to critical developments in East Germany. Churchill became involved and in due course a minute trickled down the chain to AI3b(ii); it said, "Thank you. WSC."

At that time there was considerable speculation about the purpose of three airfields, which were being constructed in the Western Ukraine, Poland and East Germany, each of which had a, for those days very long, 3,000 metre runway. We thought, probably erroneously, that they were to enable units of the Soviet Long Range Air Force (SLRAF) to be moved forward for an attack on the eastern seaboard of the United States. Others considered this unlikely, as the great circle distances, even from the most western one, were little less than from the SLRAF's normal bases; they argued that they were probably intended as SLRAF dispersal bases.

The airfield being built in East Germany was at Gross Dölln, about thirty miles to the north of Berlin, and in 1952/53 we were fortunate enough to be presented with most of the relevant plans by an East German construction engineer. He was able to visit London from time to time and I was instructed to meet him in a 'safe house'. We were to discuss the possibility of laying, under the runway intersection, an explosive charge which could be detonated by pushing a plunger in a box concealed in woods about half a mile to the east of the airfield.

To maintain the security of the safe house, I and my interpreter

were driven around London for half an hour in what appeared to be a normal London taxi, although its windows had been treated so that we were unable to see out. When we emerged we were amazed to find ourselves just outside Lords cricket ground in St Johns Wood Road, just half a mile from my home! When the meeting was over I felt that the project might well be feasible, but I declined the offer of a return to the Air Ministry by 'taxi', preferring instead to walk home.

A report on progress at Gross Dölln reached me on the very morning that I was ordered to Berlin at short notice. Before leaving, I locked the report in a strongbox and took the key with me. The purpose of my trip was to visit the refugee centre in Marienfelde, where I was to interview the first East German Air Force defector, following his failure in pilot training in the USSR. This particular exercise proved to be of little value, but I did manage to get confirmation, from the station barber's very pregnant wife (also a defector), of the arrival of a new aircraft type at the Soviet base at Neuruppin.

During my absence all hell had broken loose. It appeared the Prime Minister had taken a particular interest in the Gross Dölln project and the latest progress report was wanted, urgently! I was able to make my peace in the office but Churchill's immediate concern was interesting. He had seized on the fact that the airfield was known under three different names; the Americans called it Schönwalde III, the Germans Vietmannsdorf and the British Gross Dölln. Churchill wanted to avoid any confusion and he sent us a minute: "Let it be Gross Dölln – it is so gross." I told this story many years later at a NATO Air Order of Battle conference in Brussels when one of our American friends had referred to Schönwalde III. When they heard about Churchill's intervention, they agreed to adopt the British name from then on.

Hans Neubroch's involvement with Gross Dölln occurred several years later, when he was the RAF Ops officer in BRIXMIS. Although he routinely visited the area east of the airfield to keep an eye on the Order of Battle and observe the flying, he was, of course, unaware of the bomb plot that had been hatched in London. What he did know was that there must have been a mole working in the East German organisation responsible for airfield and associated construction work (*VEB Tiefbau*). By 1957, BRIXMIS (and no doubt other agencies) seemed to be on the distribution list for all construction plans! During



the next three years he was able to survey several airfields while they were being built, these surveys confirming the accuracy of the plans.

It so happened that in 1959 the RAF Element decided to mount a week's continuous observation at Gross Dölln. I was naturally concerned lest the team should stumble on the plunger box, located in the very area from where they were conducting their surveillance. A similar situation arose in 1961, when I was myself serving in BRIXMIS, when the Soviets imposed a restricted area around Gross Dölln after a USMLM officer (Matt Warren) had hidden himself in the same woods for an entire week. From an evening spent with Matt in New York several years later, however, I can confirm that nothing untoward happened and that the American Mission (and BRIXMIS) never knew anything about Churchill's bomb plot.

## RAF ELEMENT BRIXMIS: FURTHER RECOLLECTIONS OF OPERATIONAL EXPERIENCES (1957-59)

**Group Captain Hans Neubroch**

*Owing to the constraints imposed by time, Hans Neubroch was unable to regale those gathered at the Cold War Intelligence seminar with some of his more entertaining BRIXMIS 'war stories'. As promised, however, he subsequently submitted a follow-up piece for the Journal. This is it.*

### **Background**

My formal presentation to the Society covered the organisation of the RAF Element within BRIXMIS, its relationships with higher authority, its operating methods and the nature of the opposition in the late 1950s. This paper serves to put some flesh on these bare bones by describing some notable tours, both successful and unsuccessful, and the events of August 1958, sometimes called the Mission House Siege, which led to the Mission's address in Potsdam being moved from the *Wildpark* compound to the villa on *Seestrasse*. Although some of these events were not directly related to intelligence gathering, they do provide some indication of our relations with the East German population and police, and with the Soviet authorities, all of which provided the environment in which BRIXMIS personnel operated at that time.

### **Some Notable Tours**

In 1958 a dispute arose between RAF Germany and the RAF Element about the Soviet flying pattern. RAF Germany maintained they had evidence (presumably from ELINT) that the Soviets flew far more frequently than we said they did, and that they did a considerable amount of night flying for which we had failed to provide any confirmation. We therefore decided to maintain continuous observation, Monday morning to Friday night, of the operational base at Gross Dölln, to the north of Berlin. The RAF Element was split into three teams, each to operate an overlapping 26-hour schedule. Changeover was to be effected at primary OPs, which were to be approached with particular caution. If the team to be relieved could not be located, the next watch was to be maintained at the secondary OP. Our main OP, incidentally, was close to the ruins of Goering's

former residence, *Karinhall*. Although there were a few scares, when Soviet soldiers were seen wandering through the woods (sometimes in pairs, holding hands), the entire schedule was completed successfully, with vigorous flying being observed during daylight on Tuesday and Thursday, and minimally on Tuesday night. We decided that RAF Germany's ELINT must have been spoofed.

As I mentioned in my presentation, the requirement for technical air intelligence could best be met by high-grade photography of the undersides of aircraft. In early 1958 I realised that we were building up an extensive photo library of individual aircraft (each regimental aircraft was numbered from 01 to 39, exceptionally to 42), and I decided to attempt to provide complete coverage of the regiment at Rechlin-Lärz, some thirty miles north of Berlin. I was able to find a quiet approach to a useful hide for the mission car, the OP itself being in a swamp with ample cover being provided by tall reeds. Some excellent photography was obtained, although my flying boots did tend to leak.

On Hew Madoc-Jones' first tour I thought to introduce him to my OP in the reeds. All went well until we emerged to find our car and driver surrounded by armed Soviets who ordered us, at gunpoint, to keep away from the vehicle. Hew, who, unlike me, spoke fluent Russian, immediately engaged the senior Soviet officer in a shouting match. How dare he, a mere lieutenant, give orders to the *Gospodin Major Neubroch*? This diversion enabled me to secrete our equipment underneath my parka, which must have give me a curiously pregnant appearance. I told Hew to create another diversion, permitting the driver to open the rear car door, thus allowing me to gain access to stow our equipment and films out of sight.

I then returned to Hew and the Russians, who were still pointing their guns in a less than friendly manner. Hew told me that the lieutenant had sent for a major from the airfield, so that there would be someone who could deal with me on equal terms. I wondered how we might best pass the time. Could the Russians perhaps do a song-and-dance routine? To our delight, the Soviets obliged, all within ten minutes of threatening to shoot us. The major who eventually came was remarkably friendly, telling us that he loathed East Germany and its bogus German-Soviet Friendship toadies, and sending us on our way with his best wishes. The photo library proved a success: by the

time I left the Mission at end of 1959 we had individual high-grade photos of some 85% of 24 AA's front line strength, and our customers had excellent cover of 24 AA's operational capability.

Finding a Soviet aircraft crash site was unusual. Whereas most of our OPs were in flat country about 3 kms from the end of a runway, the one to the north-west of Werneuchen was on high ground. Werneuchen was the base of a Beagle (Il-28) light bomber regiment. On one occasion there were signs that a Beagle, coming in too low on the approach, had crashed, more or less on top of our OP. Although the Soviets had removed most of the wreckage, we found all sorts of pieces of metal, including aircraft balance weights, which we took back for analysis in the West. Of perhaps greater value were some scraps of paper, one of which may have been a table for setting values on a bomb sight, and maps showing geographic co-ordinates. In Soviet bloc countries even telephone directories were classified so maps were high-grade intelligence.

### **Some Notable Failures**

Two off-days with narks should be mentioned. As related in my presentation, we were usually able to shake any narks that picked us up at the Potsdam exits, but on one occasion I had the misfortune to run into a nark while leaving an airfield where I had been doing an aircraft count. He attached himself firmly to us and was not to be shaken. It was already afternoon so, with not much of the working day left, I decided to take him to the nearest town and complain at the local *Kommandatura*. The Soviet town major was unsympathetic, so I said, as a complete *non sequitur*, that I presumed he had spent the war safely at home. He bristled at that: he had been fighting at the Front! And whom had the *Gospodin Major* been fighting? Why, the Germans of course. And so had I! So would he now rid me of the troublesome Germans who kept following me? We shook hands on it, and I returned to Berlin unaccompanied, cherishing a minor moral victory.

On the second occasion the narks got the better of the formidable Cpl Smith, but under rather unusual conditions, severe winter with the *Autobahn* covered in glazed ice. The nark was unusually close. When we tried to outpace him, albeit carefully, in view of the skating rink surface, he managed to keep up with us for several miles, even at 70 mph. Discretion, I decided, should be the order of the day, however,

so we slowed down and made for Leipzig at a more sedate 45 mph. There we treated ourselves to a leisurely two-hour late lunch at the *Astoria*, one of the very few four-star watering holes in the DDR. When we emerged, the narks were morosely chewing on their sandwiches in the car park. We returned to Berlin without incident, but the day had been theirs.

### **The Damgarten Incident**

It is possible that by the autumn of 1959 success had gone to my head. My planning of a particular two-day tour to Rostock certainly overlooked one important factor, and on the day itself I was perhaps not firing on all four cylinders. Rostock was East Germany's major port on the Baltic and contained much of naval interest, but the airfield at Damgarten (which featured in a recent John Thaw TV thriller) had not been visited for a couple of years. It was a standard 24 AA fighter base, but I felt it was due for a check. If we were to watch a day's flying, we would have to drive there on the previous day. We could have spent the night camping out, but I opted for the comfort of an hotel. As we, Hew Madoc-Jones, our driver and I, were setting out, it had completely slipped my mind that a Belgian Air Force F-84, its pilot presumably lost, had landed at Rostock two or three weeks earlier. I should have realised that with such a guest on base, the Soviets were likely to be unusually sensitive.

An overnight stay in an hotel had to be reported to the local *Kommandatura*, so our arrival was well and truly advertised to the Soviets. Perhaps we compounded the folly by our behaviour that evening, for we found ourselves at dinner with a gaggle of junior *Vopo* officers, away from home, on a course in Rostock. Like junior officers away from home on a course anywhere in the world, they made merry, eating, drinking and ogling the local talent. Sure enough, as the evening wore on, they invited us to join them. They were a jolly lot and we easily fell into a genuine camaraderie. How were they getting back to barracks? Could we perhaps offer some of them a lift? They were intrigued: a ride with the '*englischen Offizieren?* *Jawohl, gerne.*' When we got close to their destination they asked us to stop, but I made our driver take them right up to the guardhouse. The *Vopos* felt compromised, and not best pleased. When I turned in that night I never gave a thought to the fact that we had broken my mentor,

George Foot's, cardinal rule: the opposition was thoroughly stirred up!

The next morning we meandered along the byways towards Damgarten but never got anywhere near it. We saw an unusual number of *Vopos* but they seemed not to take any notice of us. There was a lot of light aircraft flying, or was it the same light aircraft that we kept seeing? Although the penny still did not drop, they were actually looking for us. When we were obliged to slow down, while driving through a forest, a *Vopo* appeared behind us on a motor cycle, brandishing a hand gun. I was map-reading, looking for a way out of the woods, and gave the driver a wrong turn. The Baltic shore was ahead and there was nowhere else to go. We stopped. The *Vopo* took up position behind a tree, I can't think why, pointing his gun at us. I got out of the car and walked towards him. What was he up to? He ordered me not to get back into the car. I told him that the car was British territory and that I would most certainly get back into it. He ordered me not to *leave* the car! The three of us had some sandwiches. The *Vopo* stayed behind his tree, his weapon trained on us.

Some twenty minutes later the Deputy Commandant of Rostock, a Soviet lieutenant-colonel, arrived, dismissed the *Vopo* and politely asked us to accompany him to the *Kommandatura*. On arrival I told the driver not to leave the car until we returned, while we entered the dank building. We were left kicking our heels for half-an-hour, then the Commandant arrived, resplendent in his tank colonel's dress uniform. The interview proceeded along standard adversarial lines. What were we doing in a military area? We had been enjoying a sunny day by the seaside and we would like to resume our tour as soon as possible. Were we not carrying out photography of military aircraft approaching to land? Certainly not, and although we recognised that we were temporarily subject to the Colonel's jurisdiction, would he please remember his Soviet colleagues in the West. The colonel recognised the implied threat of a reprisal against SOXMIS and became a great deal friendlier. An *Akt* was drawn up, detailing the facts of the matter, as seen by the Soviet side. Would we sign the *Akt*? No, the *Gospodin Polkovnik* knew perfectly well that our general had forbidden us to sign an *Akt*. A codicil to that effect was appended. Would we sign the codicil? No, our general had forbidden that as well. The colonel left us alone for a few minutes, with a baffling request: would we please desist from contacting our headquarters? We agreed.

In point of fact, we had no means of communicating with anyone anyway, but while we were on our own, Hew, with great aplomb, photographed the *Akt!* The colonel returned and said that we would shortly be free to leave, but would we, in future, if we wished to enjoy the amenities of the Baltic coast, let him know and he would be delighted to arrange accommodation suitable for British officers. We thanked him and promised to take up his generous offer; meanwhile, was there anything by way of a bottle or two we could bring him? The colonel confessed that he was not averse to Cognac. He escorted us to our car, where our driver was bursting to see us. After a further exchange of pleasantries we left the *Kommandatura*, somewhat chastened at the failure of our mission: the air ORBAT at Damgarten remained uncertain. But we saw to it that the colonel did get his consignment of *Remy Martin*.

### **The Mission House Siege – ‘A Bit of a Riot’**

On 14th July 1958 a group of Iraqi army officers staged a coup against the pro-Western regime in Baghdad; the King, the Crown Prince and the Prime Minister were all murdered. The Lebanese President and King Hussein of Jordan appealed for military help from the United States and Britain. Next day, 1,700 US Marines waded ashore at Beirut and on the 17th RAF Hastings and Beverleys began landing the first of a more than 2,000 strong British contingent at Amman airport.

The Soviets reacted strongly. The Eastern bloc media claimed that Britain and the US were indiscriminately bombing women and children in Jordan and the Lebanon. Anti-Western demonstrations were staged in Moscow and in several other Iron Curtain capitals.

In the DDR the Socialist Unity Party had just staged its Party Congress. Khrushchev had attended most of the sessions, which had taken place under the twin slogans of, ‘IN THE DDR WE ARE ON THE WINNING SIDE’ and ‘THE VICTORY OF SOCIALISM GUARANTEES REUNIFICATION’. But what Ulbricht really wanted from Khrushchev was action to induce the Western Powers to recognise the East German state. When the Middle East crisis occurred, he saw it as an opportunity to force the sovereignty issue by acting against the only Western representatives on East German soil, the military missions. Accordingly the DDR’s government decided to stage its own ‘popular’ demonstrations on the morning of 18th July,

without giving prior notice to its Soviet ally, and it was in one of these demonstrations that I was caught up.

Returning from an all-night tour in East Germany at about 6.30 that morning, expecting merely to drop off my films at the BRIXMIS offices before going off duty, I was surprised to find the Chief, Brig Miles Fitzalan-Howard, at his desk at so early an hour. "Sorry to put this on you. Hans, when you've been out all night, but it seems there's a bit of a riot going on in Potsdam. When you've had a shave and some breakfast, would you mind going down to see what's going on? Give me a call when you get to the Mission House." Our compound was located at *Wildpark* and consisted of a number of two-storey villas. Its chief advantage was that it overlooked the Satzkorn railway sidings, important to the Soviets for shunting troops and equipment around the Berlin area. These movements could be observed at close quarters without our ever having to leave one of the villas.

The Chief was noted among his officers for never giving a direct order, but we always knew exactly what he wanted from us and I was delighted to oblige. A 'bit of a riot' didn't really suggest a violent affray, but that is just what I found when I got to the Mission compound at about 9.30 am. About 200 people had invaded 'our' territory and they forced my car to halt near the entrance. Another mission car was almost on its side and I was shocked to see my normally immaculate army colleague, Major Chris Hallett MC MBE, looking somewhat dishevelled, his shirt covered in what appeared to be blood. The crowd had clearly turned nasty, and I suspected that it could well turn nastier still, an assessment that was soon confirmed when the tyres of my car were slashed. The Mission villas seemed to be the worse for the crowd's attention: red *graffiti* on walls and doors proclaiming 'HANDS OFF THE MIDDLE EAST'; first floor windows and signals equipment smashed; telephone cables dangling from the door leading to the Signals Office. I would not easily be able to report back to the Chief as briefed.

While a handful of activists harangued the crowd about the iniquities of the Anglo-Americans, I walked across to Hallett's car and was reassured to find what I had taken for blood was actually the paint that had been used to apply the *graffiti*. Hallett had earlier secured our Union Jack which the crowd had been trying to set on fire, fortunately without too much success. Beyond that he seemed to be disinclined to



take much notice of the vulgar brawl that was going on all around him, preferring to concentrate on his *Times* crossword.

The crowd, tired of its party songs and slogans, eventually brought me their grievances about the atomic bombing of Lebanese women and children. What did I have to say about that? I showed them my copy of *The Daily Telegraph*, which had no reports of bombings, atomic or any other kind. *Ergo*, I argued, it had not happened. Why should they believe *The Daily Telegraph* rather than *Neues Deutschland*? I explained that I habitually read both papers. Whenever there was a conflict of evidence and I knew the facts first-hand, I could vouch for the correctness of the Western rather than the East German media.

This dialectic seemed to impress some of the activist intelligentsia and they invited me to address the crowd! I stood on a box, cleared my throat, and was about to begin when I was taken aback by being introduced as an Anglo-American terror bomber who was prepared to inflict untold atrocities on the women and children of the Lebanon. ‘Atom bombs’, he added, sinisterly. Too late to draw back, I started with a thumping lie. ‘How very nice to see so many of you here in the British compound!’ This naivety seemed to amuse the crowd; one or two people laughed. I went on to say, and it came from the heart, that what I would really like to be doing right now was to be employed on normal flying duties. What I certainly would *not* be doing, however, was bombing women and children and, since I knew them well, I was confident that my British and American colleagues in the Middle East were not acting in that way either. I went on to rehearse my arguments about the Western and East German press.

The crowd was warming to me; I was quite enjoying myself but the leading agitator, a nondescript man with a mousy moustache, came up from behind. He spoke quietly and, no, he didn’t say, ‘I shall say this only once’, but he did leave me in no doubt as to his meaning: “Now listen”, he said “and I know your German is good enough to understand what I am saying, you’ve had your say, and now, if you know what’s good for you, you’ll go into one of your villas until this is over.” I retired in the best order I could muster.

This is when I remembered Mrs Hare. She was the 19-year old wife of SAC Oswald Hare, one of the Mission drivers. Being under age, he and his wife were not entitled to official quarters in West

Berlin. When we learned that she was pregnant, we had arranged for them to have a flat on the second floor of one of the villas. I knocked on the door and heard Mrs Hare saying, "Oh, it's the squadron leader. Do come in." as though it was my morning for calling. Yes, she and the baby were quite all right. When she had seen the crowd, she had locked herself in and passed the time by baking a cake, and there was a good programme on the British radio service. Clearly the commotion that had been going on for some four hours now had quite failed to shake this self-possessed young woman's confidence.

I rejoined the crowd. A patrol of the People's Police appeared and said their only concern was to ensure that the people could continue to demonstrate peacefully. Next to turn up was the Soviet town patrol, a major and two sergeants. Hallett remonstrated with the major over the invasion of the British compound. The 'people' threatened to throw Hallett into the ornamental pond. The Russian seemed genuinely surprised at the invasion and had withering looks for the *Vopos*. I asked the man who had threatened me earlier, how long the demonstrations were likely to continue? He looked at his watch, "Give it another half hour or so." The crowd shouted their slogans and sang their Party songs, and thirty minutes later the agitators linked arms and pushed the crowd out of the compound, back onto their trucks.

The final chapter was utterly incongruous. As I looked in the direction of the departing trucks I saw two uniformed figures slowly advancing towards the compound. One was the imposing, stocky shape of Col Sergeyev, the chief Soviet liaison officer in Potsdam, in full fig, cavalry boots polished to perfection. The other officer was younger and slight by comparison, his neatness understated, unmistakably British. He was holding Sergeyev by the arm, as though gently leading him. He seemed to be talking to him like a Dutch uncle. It was Brigadier Miles, and I was dumbfounded to see that the Soviet colonel was crying!

"I was merely reminding him," the Chief explained as we crossed the Glienicker Bridge back into West Berlin, "that he had given me his word that there would be no violence against the Mission and that he had broken this solemn promise." With reports of disturbances at each of the three allied Mission Houses, there was some disquiet among the wives because several husbands were still in Potsdam or out on tour. The best way to restore everyone's composure, the Chief decided, was

for us all to dine together at the Club that evening, which turned out to be both a relaxed and convivial occasion. There was one formal moment, however, when Brigadier Miles presented each officer with a portion of the charred Union Jack. When my wife mentioned that she was a little nervous, because, as Duty Officer, it was my turn to go down to the Mission compound, the Chief had the deft answer: "Don't worry, Greta, let's enjoy the rest of the evening, and then Hans *and* I will go down and spend the night in Potsdam." We must have slept well for we never heard the subsequent break-in at the adjoining villa. Nothing of value was taken.

The French and US Mission Houses had undergone similar treatment. Accordingly, the heads of all three Allied Missions had filed formal protests at the violation of their compounds and submitted detailed damage claims. The US Mission, located on one of the lakes abutting West Berlin, saw a case for a motor boat which might, in any future disturbances, be used to evacuate their personnel. The US Chief obtained Soviet authorisation for such a boat and decided to celebrate the apparent *rapprochement* by throwing a grand barbecue, to which all Mission personnel, as well as Soviet liaison staff, and their families were invited, and at which the boat would be officially launched. After a well-turned speech, redolent of Western goodwill towards the Soviets, the boat was named *Druzhiba* (Friendship) and embarked the various Heads of Mission and their ladies on its maiden voyage, the party subsequently disembarking in high spirits. The following Monday, the Soviets revoked their authorisation for the US Mission's motor boat, *druzhiba* notwithstanding.

Towards the end of 1958 Brigadier Miles was asked to bring two of his officers to Potsdam to look over a possible replacement for the damaged *Wildpark* compound. They inspected an imposing lakeside villa, used as the Socialist Unity Party's school for activists, the very people who had damaged our compound. In due course the activists were informed that their school was due to move.

There was one last development. Almost exactly a year after the mission riots, the Chief was asked to call on the Soviet liaison staff in Potsdam. Col Sergeyev received him politely and from a bundle of Sterling notes and a pile of coins of the realm counted out the exact amount of the British claim. He did not ask for a receipt.

**IF IT AIN'T BROKE, DON'T FIX IT.  
DON'T EVEN LOOK AT IT!**

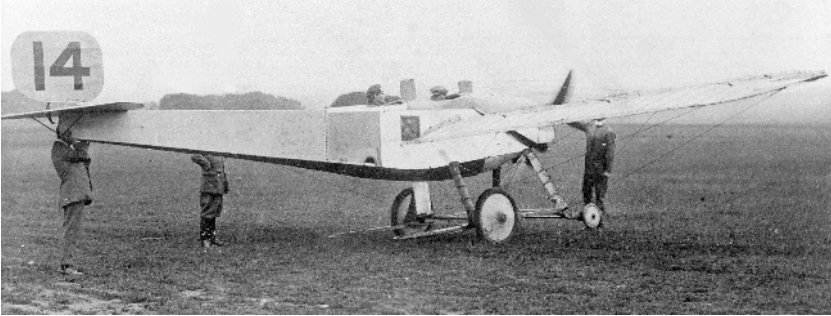
**Wing Commander George Wilson**

In his article on the Airmen's Cross in Journal No 16, AVM Barry Newton described the RFC's first fatal flying accident; the crash, on 5th July 1912, of a Nieuport Monoplane in which Capt E B Loraine and Staff Sgt R H V Wilson were killed. Capt Loraine, an experienced pilot, had had some trouble with the 70 hp Gnôme engine earlier that morning and had returned to have it seen to, but there does not seem to have been any suggestion that the subsequent accident had been caused by anything other than pilot error. R Dallas Brett in his *History of British Aviation* says: 'The pilot attempted a tight turn, side slipped inwards and dived into the ground from 400 feet.'

Two months later, however, there were two more fatal accidents which led to the new corp's first safety investigation, an innovation which was eventually to have far reaching consequences.

On 6th September, Capt P Hamilton and his passenger, Lt Wyness-Stuart, crashed at Graveley near Hitchin, in a Deperdussin Monoplane. The aircraft had apparently broken up in the air whilst flying normally at 2,500 feet. This particular machine had recently gained the second prize in the Military Aircraft Competition won by Cody and it had been taken over by the RFC only a week earlier. Investigation showed that the primary cause had been failure of the 100 hp Gnôme. A broken tappet rod had damaged the engine cowling which had then been carried around by the rotary engine, eventually fouling the fuselage and the wing bracing wires.

Only four days later, Lt E Hotchkiss and his passenger, Lt C A Bettington, were killed in a crash near Oxford while flying a Bristol Monoplane fitted with an 80 hp Gnôme. The machine had broken up in the air when a quick release fastener had opened during a gliding descent. This had happened because a ferrule, holding the fastener, had been made of the incorrect material and had broken. This had allowed a bracing wire to flap and damage the fabric of one wing. In addition, the fixing strap for the attachment had been fastened to the fuselage by only two screws where there had been provision for no fewer than nine. The uneven load due to the open fastener had caused this strap to break free, allowing the opposing bracing wire to flap,



*The Bristol-Coanda Monoplane in which Lts Bettington and Hotchkiss died on 10th September 1912. The '14' on the rudder was its competition number for the Military Aeroplane Trials of 1912. After winning the 3rd prize (£500) the Bristol was taken over by the Military Wing who allotted it to No 3 Sqn. By the time of its demise, the '14' had been replaced by the military serial 263.*

this in turn damaging the other wing.

Immediately after these two accidents, and *before* the full facts had been established, the Royal Aircraft Factory (RAF) issued a report which questioned the practicality of the monoplane. This report claimed: that it was difficult, if not impossible, to brace the wings properly; that the wing loading was too high; and that the higher speeds involved meant that landing accidents were more likely. The fact that neither of the two recent accidents had occurred during landings was ignored, as was the fact that the wing loading of the BE2, designed and built by the Factory, was actually higher than that of the Bristol Monoplane and only slightly lower than that of the Deperdussin. The report could scarcely be regarded as unbiased, however, because the Factory, which did not design or build monoplanes, plainly had an interest in promoting the merits of the biplane.

Nevertheless, the report was probably a critical factor in the War Office's subsequent decision to suspend the use of monoplanes by the RFC pending an investigation. The investigating committee included: F W Lanchester, a world recognised expert on aerodynamics; Brig-Gen D Henderson, Director of Aeronautics at the War Office; Maj F H Sykes, OC Military Wing; Maj R Brooke-Popham, OC CFS; Lt S

Grey, RN, Naval Wing and Mr Mervyn O’Gorman, Superintendent of the RAF.

Their report was delivered to the Government on 3rd December 1912, although it was not published until the following February. In addition to the two accidents described above, the Committee had also covered another, non-fatal, accident. This had occurred on 13th September when Lt Gerrard’s aircraft had suffered an engine failure shortly after taking off from Port Meadow near Oxford, although, on this occasion, a safe landing had been made.

The Committee had concluded that none of these accidents had been due to causes which were peculiar to monoplanes and had found no reason to prohibit their use, provided that certain precautions were taken, some of which also applied to biplanes. They had recommended a number of modifications to design and construction techniques, several of which could be incorporated on the existing machines. The task of carrying out the recommended modifications to the monoplanes which had already been grounded was given to the RAF. The consequences of this decision are another story, but the Committee’s further comments on testing and inspection were of even greater long term significance to the RFC and later to the Royal Air Force

The Committee had stressed the importance of testing and periodic inspection and had recommended that a thorough examination and approved test should be carried out on all aircraft before they were accepted for service. It had also urged that arrangements should be made for the regular inspection of in-service machines and engines. It was considered that permanent officials should be appointed to carry out this task and to raise any necessary reports. These officials were also to investigate and report on every accident and repair. The Committee was of the opinion that the condition of engines was of such importance to the safety of pilots and observers as to justify the employment of a dedicated engineer with extensive technical experience; it was envisaged that this ‘Inspector of Engines’ would hold a commission within the RFC, Military Wing.

They went on to say that the lives of aircrew substantially depended on the skill of the RFC’s mechanics and the Committee brought to the notice of the Admiralty and the Army Council the importance of having their mechanics adequately trained, without delay, so that they

could perform their duties in an efficient manner. To do this it was recommended that the current training arrangements should be supplemented by temporarily attaching two or three skilled mechanics to each squadron to act as instructors. The aim was to establish a high standard of technical workmanship and, to this end, it was considered that advantage should be taken of the facilities offered by private firms, both at home and abroad, for teaching men in their workshops.

Whether the delay was due to a funding problem or simply bureaucratic lethargy is difficult to determine, but nothing was done immediately to address these recommendations. Nevertheless, the Military Wing was driven to take action without War Office direction by three fatal accidents, all of them attributed to structural failure, in April, May and August of 1913. In the first of these, Lt L C Rogers-Harrison was killed at Farnborough when flying the 'Cathedral' aircraft with which Cody had won the first prize in the Military Trials of 1912, although a 120 hp Austro-Daimler engine had been fitted since then. The aircraft had broken up while gliding in to land, the accident report subsequently noting that the fabric covering the wings and elevator was old and threadbare and that the structure was in such a poor state that it had been unable to stand the strain of flying at 70 mph as a result of using the 'powerful' 120 hp engine. The pilot had been flying around the airfield for about 20 minutes and had begun a gliding descent from 1,200 feet when, at 500 feet, the front elevator had collapsed, followed by the wings. The aircraft had completely disintegrated before it had reached the ground; the pilot had died instantly on impact.

The second accident was to a BE2 at Montrose on 27th May, the pilot being Lt D L Arthur. The aircraft, which had been built in June 1912, had been fitted with new wings at the RAF in August. It had been in regular service ever since, although it had been delivered to No 2 Sqn only a few days before the accident. Lt Arthur had been at a height of 2,500 feet while descending in a gliding turn when the starboard top wing had collapsed. The pilot fell from the wrecked aircraft soon afterwards; his safety belt was later found to have been broken.

An investigation carried out by the Accidents Investigation Committee of the Royal Aero Club considered that the failure of the wing had been due to criminally negligent repair work carried out on

the aircraft, either at the RAF or in service. The main rear spar had at some time been broken about eleven inches from the top starboard wing tip. It had been repaired with a 7½ inch taper-splice, so badly made that the glue was an eighth of an inch thick in places. This crude affair had been bound with whipcord which had not been treated with cobbler's wax, as would have been normal practice. The new section of spar had not even been varnished before this bodged repair had been covered with a fabric which was different from that which had been used to cover the rest of the wing. This repair had failed, leading to the collapse of the whole wing structure. There was no entry referring to this work in the records of either the Factory or the RFC and the Committee made a strong recommendation that: 'All future repairs to service aircraft should be properly inspected, and that each such job should be marked, both by the workman concerned and by the inspector, so that in future cases stern justice could be meted out to the culprits.' Sadly, this recommendation seems to have been more concerned with identifying and punishing poor workmen than with improving standards and avoiding future accidents.

The third victim was not a member of the Military Wing. He was the famous Cody himself, who was killed at Farnborough on 7th August when one of his own biplanes broke up while coming in to land. He had just built the aircraft to compete for a £5,000 *Daily Mail* prize for the winner of a seaplane race around Britain, but it differed little from the Cathedral in which Rogers-Harrison had been killed ten weeks earlier. Cody, clinging to outmoded practices, had used bamboo for the main longitudinal members and, in a retrograde step, he had introduced wing warping for lateral control in place of the split elevator he had used previously. He had been airborne for about eight minutes and was at a height of some 200 feet while gliding in to land when the lower front spar of the port wing had broken. The aircraft had turned over in the air, throwing out both Cody and his passenger, a Mr Evans; neither of them had been strapped in.

It was clear that the cause of all three accidents had been structural failure and that they might all have been prevented if the state of the structure had been determined beforehand by independent inspection, as had been recommended by the Monoplane Committee. The condition of Lt Arthur's aircraft in particular must have caused serious concern at HQ Military Wing as well as, presumably, to the



squadron's pilots. In any case the Military Wing took appropriate action soon after Cody's death, issuing the following Routine Order on 18th August:

'Inspection of Machines The following procedure will be adopted as regards inspection of machines in future:

After an aeroplane has been in use for 12 months, or has been in the air for a total of 100 hours, it is to be examined by an Inspector of the Royal Aircraft Factory. If, on the conclusion of the examination, the Inspector is of the opinion that the aeroplane is fit for further use, he will enter in the log of the aeroplane a certificate to that effect, giving the period of further employment before re-examination he recommends. If the Inspector considers that the aeroplane should be repaired, overhauled or reconstructed before further use he will submit a report to this effect to the Officer Commanding RFC (M Wing) explaining the reason for his opinion. This report will be forwarded to The Secretary, War Office, with the Commanding Officer's recommendation as to the disposal of the aeroplane.'

A year seems a long interval between inspections but at least it was a start and it did introduce the principle of periodic inspection and condition-based servicing which forms the basis of the servicing system which is still in use to this day, not only by the RAF but by most, if not all, other air forces as well as by civilian operators.

The War Office eventually took action late in 1913, a year after receiving the recommendations of the Monoplane Committee. On 17th December an Inspection Department for Military Aeronautical Material was formed under a Chief Inspector (Maj J D B Fulton) assisted by: an Inspector of Aeroplanes (Mr G De Havilland); an Inspector of Engines (Capt R K Bagnall-Wild); three Assistant Inspectors and a staff of examiners, viewers and clerks.

This Department was soon renamed to become the Aeronautical Inspection Department which, with its offshoot, the Accident Investigation Branch, has been a key factor in maintaining the high standards of British aeronautical engineering ever since.

Early in 1914 the Military Wing took another important step when it introduced a new log book. Log books were already in use but, as the accident to Lt Arthur's aircraft shows, and as some of the instructions for using the new books imply, they had been open to abuse.

Instructions on keeping the new-pattern log books were issued by HQ Military Wing on 3rd February. These included seemingly elementary and obvious advice, such as the fact that entries were to be in ink or indelible pencil, and that pages were not to be torn out of the books. There were also instructions for the books to be checked by Flight Commanders, Squadron Commanders and even OC Military Wing. Separate logs with cross-entries were to be kept for engines and airframes, and the names of the pilot and rigger responsible for each aircraft were to be recorded.

These procedures served to establish the proper maintenance of servicing records. It had taken the Service a long time to recognise the need for preventive servicing, regular inspection for structural integrity and the setting of servicing standards, but the steps that were eventually taken in late 1913 and early 1914 did lay the foundations for the development of a systematic method of trying to detect incipient defects and to decrease the appalling accident rate. The RFC had discovered, just in time, before the outbreak of war, that it was necessary to look at things *before* they broke, as well as fixing them afterwards and that, to do this, proper records had to be kept of any work that was ever carried out on an aircraft.

**Sources:** Except where noted, this article has been based on information in a number of War Office and RFC files held under Class AIR 1 in the Public Record Office at Kew.

## **BIGGLES - THE LAST ACE OF THE FIRST WORLD WAR?**

### **Air Cdre Peter Dye**

*Since Biggles' adventures will surely be familiar to many Society members, it is surprising how little we actually know about the man. Like King Arthur, he is as much of a riddle as he is a hero. Air Cdre Dye's meticulously researched paper brings this inspirational, yet shadowy, figure into sharper focus.*

As the last few veterans of the First World War quietly fade away, with the occasional obituary to mark their passing, there is little sign that the nation's interest in the most enigmatic of their number, Major James Bigglesworth DSO MC DFC, will suffer a similar fate. A year never passes without some public debate about 'Biggles' and his exploits. The correspondence pages of the national press routinely feature letters on the subject of Biggles, most recently about his links to Lawrence of Arabia. Much of the mystery of Biggles lies in the lack of detailed information about his career, notwithstanding the numerous books and articles produced by Captain W E Johns who first brought Biggles' exploits to popular attention. What is not in doubt is that Biggles was one of Britain's most successful fighter pilots of WW I; he had more than 40 confirmed victories. It is all the more surprising, therefore, that the official record studiously avoids any reference to Biggles' wartime career.

Part of the problem is that Johns is vague about key aspects of Biggles' life and appears to have deliberately changed dates and locations, no doubt for reasons of security and to disguise the true identity of those involved. There seems to be no other likely explanation for the failure to include Biggles in the official list of British WW I Aces. Even the latest research continues to overlook Biggles.<sup>1</sup> In attempting to redress the balance, historians have been thwarted by the apparent lack of any official documents referring to Biggles. Neither the Public Record Office nor the Air Historical Branch hold any files relating to Biggles' Service career. While it is possible to put this down to overzealous weeding by unknown archivists, it is more difficult to explain why the records belonging to the units with which he flew have had all reference to Biggles excised. For example, there is no mention of Biggles in the war diary of No

266 Sqn, although we know from Johns that Biggles flew with them from the summer of 1917 until the Armistice, achieving most of his aerial victories during this period. It seems likely that this is the result of a deliberate policy to protect Biggles' identity as a member of the British Security Services.<sup>2</sup> Over the period that Johns published much of his material (1932-38), the threat from Nazi Germany was growing ever stronger and it would have been foolhardy to compromise such an effective agent. Unfortunately, this has meant that errors continue to be perpetuated by subsequent historians unaware of the deliberate attempt to conceal Biggles' wartime achievements. Thus, a highly respected and comprehensive history of RAF squadrons, published in the 1980s, continues to perpetuate the official story that No 266 Sqn was not formed until September 1918 at Mudros, in the Aegean, where it was equipped with Short seaplanes.<sup>3</sup> This error is compounded by the book's further stating that No 169 Sqn, with whom Biggles served from October 1916 until the summer of 1917, was not formed until 1942!

In the absence of Combat Reports or any other form of official record we are forced to turn to Johns' writings for the information from which to construct an accurate picture of Biggles' wartime career. It is probable that Johns had access to Biggles' log book and, of course, the man himself, as well as to his contemporaries, Wilkinson, Algy and Colonel Raymond. Even so, some detective work is called for if the date and place of Biggles' air combats are to be determined. Sometimes the clues are contradictory. A good example occurs in the *Yellow Hun* (1934), in which Johns notes that No 266 Sqn had been equipped with Sopwith Camels (in which Biggles fought the engagement in question) for nearly a month and describes the day as a 'warm spring afternoon'. Since Camels had replaced the RFC's last operational Sopwith Pups in December 1917, Johns could not have meant spring 1918. On the other hand, the first Camels allotted to the RFC did not arrive in France until June 1917. In this instance, it seems reasonable to assign the combat with von Kraudil of *Jasta 17* to the summer of 1917, rather than the spring. As it is known that *Jasta 17* arrived in the Flanders area in late June, the summer date seems confirmed. Unfortunately, there is no record of a von Kraudil having served on *Jasta 17* or any other *Jasta* units but, given the unsporting behaviour reported by Johns, it seems likely that

his name was changed before publication to avoid embarrassing his family.

Most of Biggles' aerial victories were scored with No 266 Sqn; however, there is no official date for his move from No 169 Sqn which Biggles had first joined in October 1916. Since the latter converted to Bristol Fighters before his departure, the transfer cannot have been before May 1917. In fact, as Biggles' first air combat flying a Sopwith Pup involved a significant number of Fokker Triplanes as well as Albatros Scouts, the actual date of his posting can have been no earlier than August 1917.

The final puzzle to be resolved is that of geography. No 266 Sqn appears to have been unique amongst RFC squadrons in France in that it remained on the same airfield for the entire war. Based at Maranique, north of St Omer, Biggles operated mainly over the Flanders sector. There are, nevertheless, numerous references to areas of the Western Front further to the south, including the Somme. It seems likely, therefore, that No 266 Sqn operated from an advanced airfield in the vicinity of Amiens for extended periods, although Johns makes no specific mention of this.

Despite these problems, it has proved possible to provide a rough chronology of Biggles' aerial victories between October 1916 and November 1918, even though Johns is particularly vague on the time and place of the incidents he describes. Much of this detail has proved impossible to reconstruct. The time of only one of Biggles' many air combats, that involving a Pfalz DIII over Jebel Tire, Palestine, is quoted by Johns and, even then, the date is not given, although it can not have been earlier than November 1917. Somewhat surprisingly, Johns is more forthcoming about the identities of Biggles' many opponents, such as Hess (in the incident quoted above), Leffens and von Balchow to name but a few. None of these individuals appear in the official record of *Jasta* pilots, indicating that, once again, Johns was concerned to protect Biggles from possible German retaliation.

While Johns does not provide a final total of Biggles' aerial victories, there is mention in *Spads and Spandaus* (1932) that Biggles had been officially credited with 12 aircraft and 5 balloons. There is some difficulty in fixing the date at this point, as it involves a squadron of the United States Air Service (the 299th Pursuit), equipped with Spad fighters. This suggests that it can have been no

earlier than June 1918, although by this time Biggles had officially shot down more than 20 aircraft. Perhaps, modesty prevented his actual score being revealed to his fellow American aviators, none of whom had yet seen aerial combat. This could also explain why there is no record of the 299th Pursuit Squadron ever having served in France.

Listed below are Biggles' known claims with reference to the original publications in which they are to be found. His credited victories comprise 41 aircraft (including 2 shared with Algy) and 3 balloons, making an official score of 44. Of course, it may well be that there are other victories to add to those listed. Johns was a prolific writer and it is quite possible that there are further combat claims to be discovered in as yet unrecorded publications. Whatever further research may reveal, it is quite clear that Biggles was amongst the leading British Aces of the Great War.

1. The most comprehensive analysis of the fighter aces of the British Empire air forces, *Above the Trenches*, published in 1990, fails even to include Biggles.
2. Johns makes specific reference to this issue in his introduction to *Biggles Flies East*. There are clear parallels in the well-known uncertainties over the wartime career of the Canadian fighter pilot, William Stephenson, who played an important role in counter-intelligence during the Second World War.
3. Wing Commander C G Jefford, *RAF Squadrons*, Airlife, 1988.

**Editor's Note.** It should perhaps be explained that, unlike British practice during WW II, when victories were specifically categorised as confirmed, probable or damaged, this was not the case in 1914-18. In the early days of WW I, it became the practice to record when one had emerged from an engagement as the victor. This did not necessarily imply that the enemy aircraft had been destroyed; the important point to register was that its crew had been defeated. This procedure was sustained throughout the war, which did tend to inflate British claims somewhat. Nevertheless, the confirmation process soon became relatively sophisticated and contemporary documents, particularly Combat Reports but including squadron, wing and brigade records, almost always reveal whether the enemy aircraft (EA) had been destroyed (DES), had fallen in flames (DES(F)), had been forced to land (FTL) or had merely been driven down out of control (OOC). In recent years, researchers working in this field have established what amounts to a convention for presenting the details of victory claims and Air Cdre Dye has used this format here, although, in the absence of the primary sources which would normally feature in the final column, he has been obliged to note which of W E Johns (at least 71) published accounts of Biggles' exploits provided the relevant data.

### **BIGGLESWORTH James, Major, DSO MC DFC**

Born in Garhwal, West Bengal, India, in August 1899, he enlisted as a 2nd Lt in a Rifle Regiment in the summer of 1916, before transferring to the Royal Flying Corps after only 2 week's basic training. He was posted to No 17 Flying Training School, Settling, Norfolk in late September 1916 and completed his training at No 4 School of Fighting, Frensham, Lincolnshire, before joining No 169 Sqn in France flying the FE2. In the spring of 1917, he was posted to No 266 Sqn, Sopwith Pups, based at Maranique where he served for the remainder of the war, apart from a brief spell in the Middle East on special duties. The Armistice precluded his taking command of No 319 Sqn, equipped with Sopwith Snipes.

<b>No</b>	<b>Date</b>	<b>Type</b>	<b>Sqn</b>	<b>Type/Location</b>	<b>Time</b>	<b>Claim</b>	<b>Source</b>
	<b>1916</b>			<b>FE2</b>			
1.	Oct	EA 2-seater	169		pm	DES	<i>Battle</i>
	<b>1917</b>						
2. <sup>1</sup>	Apr	Albatros DIII	169			DES	<i>The Camera</i>
3. <sup>2</sup>	Apr	Albatros DIII	169			OOC	<i>The Camera</i>
				<b>Bristol Fighter</b>			
4.	Apr	Albatros DIII	169			DES	<i>The Camera</i>
				<b>Pup</b>			
5.	Aug	Rumpler C	266	near Maranique		FTL	<i>The Pup's First Flight</i>
6.	Aug	Fokker Dr1	266	near Douai	pm	OOC	<i>Caught Napping</i>
				<b>Camel</b>			
7. <sup>3</sup>	Sep	Albatros DIII	266	Passchendaele		DES(F)	<i>The Yellow Hun</i>
8.	Sep	Fokker Dr1	266		am	OOC	<i>The Dawn Patrol</i>
9.	Sep	Fokker Dr1	266		am	DES	<i>The Dawn Patrol</i>

10	Sep	Albatros DIII	266		pm	DES	<i>A Ride to Remember</i>
12.	Sep	Halberstadt	266		am	DES	<i>The Camera</i>
13.	Oct	Pfalz DIII	266	Maranique		FTL	<i>The Zone Call</i>
14.	Oct	Rumpler	266	Talcourt-le-Chateau		DES	<i>The Decoy</i>
				<b>Pup</b>			
15. <sup>4</sup>	Nov	Pfalz DIII	SD	Abba Sud Oasis		DES	<i>Biggles Flies East</i>
				<b>Camel</b>			
16. <sup>5</sup>	Nov	Pfalz DIII	SD	N Jebel Tire	1051	DES(F)	<i>Biggles Flies East</i>
17.	Dec	Albatros DV	266			DES	<i>War in Hot Blood</i>
18.	Dec	Albatros DV	266	Seclin		OOO	<i>War in Hot Blood</i>
19.	24 Dec	Albatros DV	266	Seclin		OOO	<i>The Turkey</i>
		<b>1918</b>					
20. <sup>6</sup>	Feb	Albatros DV	266	Aerodrome 32		OOO	<i>The Professor</i>
21. <sup>7</sup>	Mar	Pfalz DIII	266			DES	<i>The Bridge Party</i>
22.	Mar	Balloon	266	Duneville		DES(F)	<i>The Bottle Party</i>
23.	May	Albatros DV	266			OOO	<i>The Funk</i>
24.	Jun	Albatros DV	266	Nr Maranique		DES(F)	<i>The Rescue Flight</i>
25.	Jun	Albatros DV	266	Douai		DES	<i>The Rescue Flight</i>
26. <sup>8</sup>	Jun	Roland	266			DES	<i>The Rescue Flight</i>
27.	Jun	Albatros DV	266	Nr Belville		DES(F)	<i>The Rescue Flight</i>
28.	Jul	Albatros DV	266			DES	<i>Spads and Spandaus</i>
29.	Jul	Fokker Dri	266	Berslaade		OOO	<i>Fog!</i>
30.	Jul	Hanoverana	266	Aerodrome 29	am	DES	<i>The Battle of Flowers</i>
31.	Jul	Fokker Dr1	266			DES	<i>The Balloonatics</i>



32.	Jul	Balloon	266	Duneville		DES(F)	<i>The Balloonatics</i>
33.	Jul	Balloon	266	Duneville		FTL	<i>The Balloonatics</i>
34.	Aug	Albatros DV	266			DES	<i>The Blue Devil</i>
35.	Aug	Fokker DVII	266			DES	<i>The White Fokker</i>
36.	Aug	Hanoverana	266	Berniet		DES(F)	<i>J-9982</i>
37.	Aug	Camel	266	Berniet		DES(F)	<i>J-9982</i>
38.	Aug	Fokker DVII	266	Berniet		DES	<i>J-9982</i>
39. <sup>9</sup>	Aug	Albatros DV	266	Somme		DES	<i>Biggles Finds His Feet</i>
40.	Aug	Freidrichshafen	266		am	DES	<i>The Bomber</i>
41.	Sep	Hansa-B W19	266	Ramsgate		DES	<i>On Leave</i>
42.	Sep	Hansa-B W19	266	Ramsgate		DES	<i>On Leave</i>
43.	Sep	Fokker DVIII	266			DES	<i>The Ace of Spades</i>
44.	10 Nov	Fokker DVII	266	Lille	1100	DES	<i>The Last Show</i>

1. Shared with unknown FE pilot.
2. Shared with unknown FE pilot.
3. Von Kraudil, *Jasta 17*.
4. Ltn Karl Leffens (6 victories).
5. Hptm Kurt Hess (26 victories).
6. Shared with Lt A M Lacey ('Algy').
7. Shared with Lt A M Lacey ('Algy').
8. Ltn von Balchow.
9. Destroyed by Biggles from the ground.

## FEEDBACK

### The Comox Conundrum

I read the articles on Air Transport in Journal 22 with particular interest, having long ago been a Dakota navigator on Nos 62 and 48 Sqns in SE Asia. I wonder if you would publish a supplementary question which has perplexed me for many years. Why was No 6 (Transport) OTU set up in June 1944?

The unit's origins were at Patricia Bay, near Vancouver, where No 32 OTU (RAF) had been established late in 1941 to train torpedo-bomber crews on Hampdens. In December 1943 it changed to a transport OTU, and as flying training became congested at 'Pat Bay' it moved in June to become the sole occupant of the newly completed RCAF Comox where it was renumbered as No 6 OTU (RCAF). By the end of July there were 255 aircrew in training (70% RAF, 30% RCAF), and on strength were 36 Expeditors and 18 Dakotas. The CO was Gp Capt P H Maxwell (RAF) who had previously been at Dorval, the Montreal base for transatlantic ferry flights.

We were crewed up in threes - no co-pilots. The pilots were almost all ex-instructors from the Canadian flying schools, which at this stage of the war were winding down their programme. The Expeditors assisted the pilots' graduation to Dakotas. Most of the wireless operators had been brought out from the UK, veterans of a tour on bombers. Almost all the navigators were 'sprogs' like myself, straight from 'wings' parade. I would be in experienced hands - my unflappable skipper had 1,500 hours on Harvards; but I anxiously wondered at first what he and our WOp would expect of me.

We trained entirely for long-range transport. For navigators this meant emphasis on astro, with long sessions in the Celestial Link Trainer. Almost all of our flying was out over the Pacific, where there was no GEE or LORAN, and for which there was little accurate weather forecasting. There was lots of practice too, in ground school, of the various main ferry routes: not just Dorval to Prestwick, but the long haul to Cairo, via Florida, Brazil, Ascension and Lagos - a flight I would have loved to make for real. Sometimes ground instruction was particularly esoteric. I remember learning how to calculate high tide for any given day at Auckland, which seemed far from any possible battle zone or ferry link, even supposing that I might have

been navigating a Sunderland which needed a safe anchorage for the night. Perhaps it was such a topic which provoked the conference mentioned in Comox's Station Daily Diary for 8 September 1944: "... a meeting to better co-ordinate ground and air instruction."

The flying was great, especially when we graduated to Dakotas, all fitted with auxiliary fuel tanks installed aft of the bulkhead. We went out over the Pacific for six, seven, and once for nine, hours. All good training for long-range flights in parts of the world where there were few or no advanced navigational aids; and the thought of the mountain ranges down the west coast encouraged accuracy when coming home at night or in bad weather.

I enjoyed that Comox posting. But why were we there? Why were we given such training at that stage of the war? The AOC Transport Command, Air Chf Mshl Sir Frederick Bowhill visited the station during my stay, I do not remember him talking to the trainees. Where, I wonder, was it envisaged that many transport squadrons would be engaged in the sort of operations for which we were being trained? Surely by the second half of 1944, long-range ferry operations were winding down, and in both the European and Asian theatres, the main use of transport squadrons was in support for the army. And so it was to be for us. No crew from my time at Comox was posted to Dorval or any other ferry base, nor to a long-range transport squadron. It was back to England by troopship, to No 107 OTU at Leicester East, where we were taught all those army-co-operation skills. From there, it was out to Burma. However, it turned out that some of the work at Comox was not wasted. After the Japanese surrender we were kept busy over a wide area of SE Asia, where there were few aids to navigation, and I count myself particularly lucky to have finished my service on No 48 Sqn at Changi, with long-haul runs over the South China Sea to Hong Kong (two days, with a stop at Saigon) and over the Bay of Bengal to Calcutta.

I have gone on too long. But can someone tell me why a long-range transport OTU, was established at Comox *in the summer of 1944*? I have studied the Station Daily Diary on microfilms from the National Archives of Canada (Nos C-12-361 & C-12-362) but among a lot of interesting information to refresh my memory there was no answer to my question. The only answer I can suggest is that plans were first made early in 1943, and that when Comox became available

in June 1944, no one thought to alter them in the light of changing operational requirements.

I must not end without expressing my appreciation of the high standards of the Journal over many years. It does make a significant contribution, not only to the history of the RAF, but to the study of air power.

**Donald F Harris, Shrewsbury**

**Gp Capt Denis Croucher** has written in a similar vein. He started his course at Patricia Bay in February 1944 and notes that crews included RAAF, as well as RAF and RCAF personnel. Like Donald Harris, he was extensively trained in long-range ‘ferry’ techniques but, shortly after returning to the UK in June 1944, he too was posted to India where the Canadian members of his contingent eventually joined Nos 435 and 436 (RCAF) Sqns, most of the others finding their way to Nos 62 and 194 Sqns. All of these units flew Dakotas on relatively short-range tasks, which raises the same question. Why the investment in long-range work?

The most easily accessible reliable reference, Carl Christie’s *Ocean Bridge*, notes that to prepare Hampden crews to ferry themselves back to the UK as ‘one trippers’ (although not all of them would have actually done this), No 32 OTU’s syllabus had always included long-range navigation. This aspect of the course became increasingly dominant and in December 1943 No 32 OTU became a dedicated transport unit. The syllabus, which ‘was based on the one in use in Britain, stressed long-distance flying.’ This may hint at the answer we seek, as it suggests that, rather than being trained for ferry duties, the prevailing policy was to prepare all transport navs for what amounted to the worst case, ie long-range flying over empty spaces. With that under their belts, those posted to strategic transport units, could presumably just get on with it (after any necessary type conversion). This was a fairly small market sector for new boys, however, and most freshmen finished up on domestic ‘airline’ duties at home or abroad or in tactical outfits, the latter requiring an appropriate role-related course in army support techniques, parachuting, supply dropping, glider towing and the like.

One can understand that impatient young navigators, who were not immediately called upon to exercise their recently acquired long-range

skills may well have regarded the Comox course as a bit of a waste of time. On the other hand, seen from a global viewpoint, providing all transport navs with a sound foundation in long-range techniques may well have been a seamanlike precaution. After all, Donald Harris owns that he did eventually find his No 6 OTU training of value when flying long-haul after the war. Similarly, while Denis Croucher states in his letter that the course was ‘completely irrelevant’, he too acknowledges that what he had been taught was later put ‘to very good use’ during a stint with BOAC in 1947-49. Could it be that, while the prospect of ferrying may well have been presented to the trainees of 1944 as the immediate justification for their courses, the underlying philosophy was actually to provide all ‘truckies’ with the flexibility that both of our correspondents were subsequently able to demonstrate?

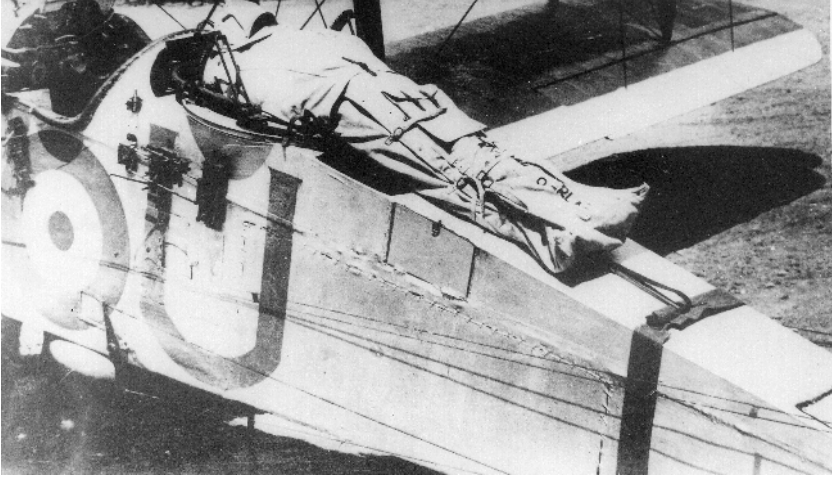
While this is merely the editor’s interpretation, this topic has been discussed with the AHB’s Gp Capt Tony Stephens who concurs. Are there any transport policy men from 1943-44 out there who can shed any more light?

**CGJ**

### **Stretch(er)ing a Point**

Sparked by the interesting, if rather familiar, picture of a DH 9 ambulance in Journal 22, **Peter Green** has submitted something a little different. The date and location are uncertain but, the idea was plainly to immobilise the injured party in a rigid straight jacket and then strap him to the upper decking of a handy Brisfit or Ninak, using the Scarff ring as the main anchorage. The hapless casualty then had a bag pulled over his head before experiencing a ride which would probably still bear comparison with the best that Alton Towers can offer – especially with the recommended prospect of a morphine ‘trip’ to heighten the experience. Under other circumstances this might qualify as a ‘cruel and unusual punishment’ and an airman subjected to this sort of treatment today could probably sue the Crown, but in the 1920s this was the height of paramedical sophistication.

Also published here are the associated contemporary instructions, although these have been edited somewhat to approximate the current conventions of what the RAF used to call Service Writing, although it is now obliged to use the more politically correct ‘Defence Writing’.



*The date and location of this photograph are not recorded but it was clearly somewhere hot in the 1920s; a single code letter aft of the roundel on a DH 9A is not much to go on, but the seriffed style of the 'U' suggests No 8 Sqn at Hinairi. Note the High Altitude Drift Bomb Sight Mk Ia mounted below the rim of the rear cockpit.*

Note that, in the original version, the No 3, Mk II Barbettes (to give it its official name) was referred to as a Scarfe (*sic*) mounting. This was, and still is, a common misnomer, the correct colloquialism being Scarff, after the designer of the installation WO F W Scarff, RNAS. **Ed.**

### **Neil Robertson Stretcher - Instructions.**

1. To enclose patient in stretcher.
  - a. Open out stretcher and lay patient on bamboo with back of head on centre cushion. See that grommets are through cloak.
  - b. Fold bamboo over legs and secure: the chest piece to be strapped quite loosely - a deep breath being taken as indicator. Arms outside.
  - c. Fold cloak as indicated and secure all cloak straps. Face mask to be kept open and only just closed before machine takes off.
2. To attach stretcher to DH 9A or Bristol Fighter.

- a. If no ambulance available - two men required. Secure a rope to heading of stretcher and run free end through yoke of Scarff mounting arm and hoist into position. Then proceed as in para 2b(5) below.
- b. With ambulance - four men required. Positions of men:- No 1 in pilots cockpit; No 2 on fuselage steps; Nos 3 and 4 in ambulance.
  - (1) Place stretcher on upper tier of ambulance with head to rear: see that all straps are hanging free.
  - (2) Back ambulance close to starboard side of fuselage and opposite Scarff mounting.
  - (3) Rotate arm of Scarff mounting to port.
  - (4) Thrust patient forward out of ambulance. (see photograph on back).
  - (5) Secure the six leather straps as directed on each.
  - (6) Ambulance goes forward and stretcher is man-handled by Nos 3 and 4.
  - (7) Swing arm into zero position and secure fuselage strap at struts (see photograph).
  - (8) At last moment fix face mask.
3. To receive stretcher from Machine. The measures described in "2b" are merely reversed. The machine on landing should await ambulance and not taxi.

Note.

1. The inner blanket is detachable. Face mask and cushion slip are also detachable for cleaning.
2. a. In summer.
  - (1) If the inner blanket should be removed it should be wrapped around the patient's feet.
  - (2) Heat discomfort experienced on the ground ceases once the machine takes off.
- b. In winter. It may be necessary to augment cloak coverings by means of extra blankets and hot water bottles.
3. If not contra-indicated by disease. The patient should be given an injection of morphine about 20 minutes before machine takes off.
4. Patients suffering from pneumonia or spinal injuries should not be transported by this ambulance outfit.

## BOOK REVIEWS

**War Atlas of Asia and the Pacific 1941-1945** by David Smurthwaite. Airlife Publishing Ltd; 2000. Price £12.95.

The original edition of this book, published by HMSO in 1995, was not reviewed by this Society. This new edition also emanates from a quality publishing house; the experienced author is Assistant Director of the National Army Museum. The book, 144 pages of approximately two-thirds A4 size, contains more than 100 coloured maps and small illustrations; it is surprisingly detailed, given the scale and geography of the operations. Mr Smurthwaite is at ease with his subject and the text is authoritative and well-marshalled. After a compact introduction, he starts with the period between the wars prior to the Japanese onslaught in December 1941, going on to record their subsequent successes until Allied resources could be improved, leading to the final Japanese surrender in August 1945.

As expected, given the title of the book, the maps are excellent and repay careful study. I do have one constructive criticism, however, which is to observe that most printers would advise against printing black on a medium or dark blue background; better to reverse out the lettering in white, which is precisely what the publishers did with their own details on the back cover - QED.

This is a welcome addition to the military bookshelf at a reasonable price.

**Roy Walker**

**Faster than the Sun** by Peter Twiss. Grub Street; 2000. Price £9.99.

I still have my *Eagle* diary with its picture of Peter Twiss after he became the first man to fly at 1,000mph in the Fairey Delta 2. *Faster than the Sun* recounts the compelling story of that record-breaking event in March 1956, interspersed with biographical flashbacks of Twiss' formative days and Fleet Air Arm operational service. Looking back from our age of certainties and computer modelling, it is salutary to remember that thirty-two British test pilots died between the end of the war and 1951 alone. This book goes part of the way to explaining why, by illustrating the extent to which aircraft designers and engineers felt their way forward in the early supersonic age. Concorde's 'droop snoot' was tried and tested on the Fairey Delta, and



Twiss was expected to find out the hard way whether or not his hydraulic power controls worked when the engine failed.

Peter Twiss tells his tale in the typically modest and understated manner of the man himself. But rather than being uplifted by his book, I have to admit that I put it down at the end with a heavy heart. To read how much British aerospace was capable of in the mid-1950s, and how much of it came to grief at the hands of the bean counters and unimaginative 'Jobsworths', is no fun. Every time I see a Mirage flying by, I reflect on how much Fairey's expertise could have done for Britain. Peter Twiss shows no sign of anger or bitterness, and his is a fine tale well told. But it is a sad one nevertheless.

**Wg Cdr Andrew Brookes**

**Naval Fighter Pilot: Lt-Cdr R J Cork DSO DSC RN** by A H Wren. Heron Books; 1998. Price £16.99. The publishers have generously offered RAFHS members the opportunity to purchase this hardback at only £10.99 (inc p&p); apply to Heron Books, PO Box 1112, Lichfield, Staffs, WS14 9FN.

The name of 'Dickie' Cork will be remembered by some Battle of Britain veterans, as one of a small number of naval pilots attached to the RAF in the second half of 1940. Sub-Lt(A) Cork joined No 242 Sqn at Coltishall where he successfully adapted to operational flying, eventually becoming a member of Bader's own section. He was notified of the award of a DFC while flying with No 242 Sqn, an award which was swiftly converted into a DSC by the Navy. Released by Fighter Command as winter set in, he briefly flew Blenheims from Chivenor with No 252 Sqn of Coastal Command before returning to the Fleet Air Arm in early 1941.

An extended period of operations followed and by August 1942 he was a Flight Commander with No 880 Sqn aboard HMS *Indomitable* which was about to escort a large and vital convoy through to Malta, Operation PEDESTAL. Losses were severe and Cork assumed command of his squadron when its CO was killed. A badly damaged *Indomitable* docked at Gibraltar for temporary repairs prior to returning to Liverpool. Cork was admitted DSO and 'screened' to become CFI at Yeovilton. He later returned to operational flying as Wing Leader aboard HMS *Illustrious* only to be tragically killed in a flying accident in April 1944, aged just 27.

The author, son of another late Fleet Air Arm pilot, is to be congratulated for seeing this biography recorded in print, but there are some technical shortcomings. The book contains several quotations from many willing contributors which should have made an index mandatory, yet not even a list of contents is provided, even though there are spare pages at the end of the book and others which could have been arranged. For unidentifiable reasons the Prologue and Acknowledgements appear in an obviously smaller print size, and the proof-reading is moderate. This is a very readable book, although it could have been better presented.

### **Roy Walker**

**Pilot's Summer** by Frank D Tredrey. Tiger & Tyger; 2000. Unit 9, Old Boundary Way, Ormskirk, L39 2YW. Price £15.50.

First published in 1939, *Pilot's Summer* is the author's story of his Instructors Course at the Central Flying School in 1935. Acclaimed at the time, it somehow got lost in the fog of war but fortunately has now been reprinted in paperback. The story is told in diary form, a diary meticulously kept each day over the three-month period of that summer's Course. Much of it is devoted to a detailed description of the flying. The spirit of adventure and excitement of flying in those days shines through with its open cockpits, smell of aviation petrol, hangar dope and oil, etc.

There is a nice blend though of life on the ground. We are given a fascinating picture of the happy but disciplined life in the Mess with its comfortable quarters, batmen, formal dinners in mess kit several times a week and good companionship. Life outside the Mess too is amusingly and graphically described, from the train journey between London and Stamford, to life in the villages and countryside and the trauma of dealing with one's London tailor.

The pilots lived a life of the privileged few in society. It was great fun but at the same time they worked hard and to strict rules. The Course was busy and the diary brings out the exacting standards set by the Central Flying School, even in those early days. The co-ordination which had to be mastered to perfection between the instructional patten and complex flying manoeuvres will evoke memories in anyone who has been through the Instructors Course.

The book presents a wonderful picture of life in the RAF of the

1930s. The story is elegantly told in an easy flowing style and with a delicate blend of humour. It is a real classic; a 'must' for aviators young and old, but there is also much in it for any reader to enjoy.

### **Marshal of the RAF Sir Michael Beetham**

**The Day We Bombed Switzerland** by Jackson W Granholm. AirLife; 2000. Price £19.95.

Jackson Granholm was senior navigator on a B-24 group flying out of Horsham St Faith (now Norwich Airport) during the war. "Ho hum," I hear you cry – yet another 'I was there' catalogue of reminiscences. But this is a much better history than many of its ilk. Granholm, a witty and thoughtful writer, paints a very good picture of US Army Air Force life in wartime Norfolk. He is an obvious Anglophile, which is nice, but his gift lies in being able to tell a serious story in a chatty and unpretentious style. For too long, the strategic bombing saga has been hijacked by two camps - the air rank brigade who would have us believe that everything was done in the best possible taste, and the revisionists who do not have a good word to say for the bombing effort. Granholm, by weaving his tale between the mundane (but often hilarious) realities of life in USAAF uniform, and the aerial trials and tribulations of bombing occupied Europe in the last year of the war, gets as near to 'the real world' as I have read. He certainly answers the question of what constituted a 'target of opportunity' where it mattered, ie where the rubber met the road.

The title comes from the incident in March 1945 when a bevy of Liberators bombed Zurich and Basel by mistake. Granholm was on the defence team at the subsequent court martial, and much of the transcript – faithfully recorded in the book – has resonance today for any aircrew who feel in danger of being stitched up by higher authority. All in all, this is a fine read. Buy it, because you're not having my copy.

### **Wg Cdr Andrew Brookes**

**A Trenchard 'Brat'** by F A B Tams. The Pentland Press; 2000. Price £15.00.

As the title chosen for his memoirs implies, Frank Tams began his Service career at Halton. While he clearly still takes considerable pride in his origins as an apprentice in 1930, like many of his kind, he

soon cut the apron strings to become an airman pilot. Commissioned shortly before the war, by which time he was flying Ansons with No 217 Sqn, he had converted to Beauforts by February 1941 when he was shot down over Brest. Obligated to spend the rest of the war as a PoW, he was involved with the 'Wooden Horse' escape from *Stalag Luft III*. Repatriated in 1945, he became, after a couple of months on Fortresses with No 521 Sqn, CO of No 517 Sqn flying Halifaxes from Chivenor. A subsequent stint at Northwood was interrupted by a six-month battle with TB, following which he commanded No 224 Sqn at Gibraltar in 1948-50. Thereafter he filled a number of staff appointments, retiring in 1959 after a final tour as OC Admin Wg at St Eval.

Unfortunately, Pentland appear simply to have published the draft manuscript as submitted. The book desperately needed editing, for style (to remove a number of repetitive passages) and for content (to correct the many factoids). Examples of the latter include: p51 - *High Flight* was written by Magee, a US citizen who had enlisted in the RCAF (not by Maggee who was killed 'shortly after leaving Rugby') and, having been introduced in 1919, short service commissions were hardly 'new' in 1936; p78 - the Blenheim I was not 'much larger' than the Anson (it had much the same wingspan and was two feet shorter); p91 - the Hudson did not have a nosewheel and Trubshaw never flew the Brabazon; p143 - Brawdy is in South (not North) Wales; p145 - the Spitfire XVI had four (not five) propeller blades; p161 - the last Halifax to fly with No 224 Sqn was a Mk VI (not a Mk III); p171 - Claude Grahame-White lacks both the 'e' in Grahame and his hyphen; p180 - the British High Commissioner in Malaya is identified as both Sir Henry and (incorrectly as) Sir Edward Gurney while two pages later the AOC is named as AVM Scherger and (incorrectly as) Sherger; p183 *et seq* - all references to the use of 'Lancasters' as bombers during FIREDOG should read 'Lincolns'; and so on, and on. As for the reproduction of photographs (some of which are probably quite interesting), if this is the best that Pentland can do, they really ought not to bother.

Despite all of this, while its telling may leave something to be desired, Tams' story, that of a typical middle-ranking 'regular' of his era, is a worthwhile contribution to the recording of RAF history. It's a shame but, in view of its serious shortcomings, I recommend that

you read this one before deciding whether to invest in a personal copy. Try your library first.

**CGJ**

**RAF Bomber Command Losses of the Second World War, Volume 6, 1945** by W R Chorley. Midland Counties Publications; 1998. Price £14.95 post free to UK addresses (15% overseas p&p), if ordered direct from the publisher.

Many readers will be familiar with this excellent series of softbacks, and this volume completes the substantial story of the operational squadrons throughout Bomber Command's long and arduous campaign. Notwithstanding that by this stage the Allies had almost complete air superiority and the German defences were increasingly extended, Bomber Command still lost 1,080 aircraft in this final year of the war in Europe. As before, the entries appear in date order; each summary with the squadron, aircraft type, serial, crew names and the circumstances in which the loss occurred.

Among the many valuable appendices there is a detailed report on the German night-fighter operation code named *Gisela* on the night of 3rd-4th March 1945. Almost 200 enemy aircraft intruded inland from the Thames Estuary to North Yorkshire punishing a comparatively small bomber force on their homeward journey. Nineteen or twenty of our returning bombers were shot down, plus a further five aircraft from Heavy Conversion Units. The cost to the *Luftwaffe* was also high with some twenty-five aircraft, all Ju88 variants, being written off. Had attacks of this size been mounted earlier and sustained it might have been a different story.

Members may be interested to know that Mr Chorley is now working on further volumes which will detail the in-training losses incurred by Bomber Command's OTUs and HCU's. Recommended.

**Roy Walker**

**RAF Fighter Command Losses of the Second World War, Volume 3, 1944-1945** by Norman L R Franks. Midland Publishing; 2000. Price £14.95 post free to UK addresses (15% overseas p&p), if ordered direct from the publisher.

Volume 2 of this valuable reference source was reviewed in Journal 20, and this new book, which completes the series, also

includes losses incurred by Air Defence of Great Britain and 2nd TAF. Produced to similar high standards and very much along the lines of its companion series, *Bomber Command Losses*, it provides a wealth of information complemented by detailed appendices and illustrations, many from this very experienced author's own collection. Recommended.

**Roy Walker**

### **The Battle of Britain**

Can there really be anything new to say about 'the Battle' after all these years? – and all those books? The facts have been exhaustively filtered, refined, collated, tabulated and presented in a variety of ways. Both sides' tactics have been reviewed, analysed and criticised and the very significance of the engagement has been debunked by revisionists and defended with equal vigour by traditionalists. On top of all that, there have been numerous personal accounts. A moratorium might be appropriate, but the publishers seem to think that the market is insatiable and books about the battle continue to proliferate. Here we have five, of well over a dozen new, or recently re-released, Battle-related titles.

**The Battle of Britain** by Roy Conyers Nesbit. Sutton; 2000. Price £25.00.

While Roy Nesbit provides a workmanlike narrative, summarising the evolution of the UK's air defence system prior to the outbreak of war and providing an account of its operations up to October 1940, the author of this large format volume (30.4cms × 22cms) is not really attempting to add anything new to the nuts and bolts of the story. His underlying intent is plainly to try to recapture something of the atmosphere of the period. The book is not about words; it is about pictures. The illustrations, which have been carefully selected, include reproductions of pages from contemporary publications, for example government information leaflets, advertisements and magazine covers, both German and British. Some of the latter are in colour, as are a dozen paintings by well-established artists. And then there are the photographs; I made it 240 of them. All of the pictures have been very carefully reproduced. The purist may take issue with the fact that,

presumably in an attempt to heighten the period 'feel', some photographs have been printed in blue or sepia inks; others have been spread across two pages, inevitably creating a 'staple in the navel' effect.

Does it all work? Yes; well almost. The text does not delve too deeply and it provides an adequate summary of the events. Paradoxically, the flaw in the book lies in the very excellence of the photographs used. Some of these seem familiar and will have been drawn from official sources, others are typical of those that used to illustrate *Picture Post* and the like. The problem is not so much that one feels as if one has seen them before but that many were intended as propaganda pictures. As a result, we are presented with an image of indomitable Brits, smiling bravely in the face of adversity; there is not a lot of blood and grime. By using this material, the book inevitably tends to recreate the impression that the artfully named Ministry of Information was at pains to foster, which may not reflect the *Zeitgeist* of the summer of 1940 with absolute fidelity. Good though.

**CGJ**

**Battle of Britain Day – 15th September 1940** by Dr Alfred Price. Greenhill; 2000. Prices: hardback £17.50; softback £11.95.

In contrast to the previous volume, which presents a panoramic view of the entire battle, this one places just one day under the microscope. Drawing on the official records of both sides and on the personal reminiscences of the bombers *and* the bombed, as well as the more usual defenders, Alfred Price has reconstructed an almost minute-by-minute account of the events of what came to be recognised as Battle of Britain Day.

All of this takes about 115 pages which are followed by another 25 of analysis and reflection, the whole being supported by about seventy-five photographs, sandwiched in the middle, and annexes providing the customary ORBATs and a very detailed accounting of the individual aircraft losses actually suffered by each side. It is good stuff, *very* thoroughly researched and presenting convincingly argued reasons for dispensing with a number of myths, eg despite frequent claims to the contrary, the RAF never succeeded in 'breaking up' bomber formations nor did it cause them to 'turn back'.

This is not a new book, however; it is a reprint of one which first

appeared in 1990. One hesitates to use a word as overworked as 'definitive' but, for an objective account of what *really* happened during the air fighting in 1940, this is as close as we are ever likely to get.

**CGJ**

**Blitz on Britain, 1939-45** by Alfred Price. Sutton; 2000. Price £20.00.

It is perhaps a little unfair to characterise this title as a 'Battle of Britain book' as it actually deals with the German air offensive against the UK in its entirety, including the *Baedeker* raids, Operation *Steinbock* and the air-launching of V-1s (but not those launched from the ground or the V-2 onslaught). Nevertheless, about half of the content is concerned with the events of 1940 and one is impressed to read of a low-level attack on Kenley on 18th August during which the incoming Dorniers had to *climb* to their minimum release height of 45 feet.

*Blitz* first appeared as long ago as 1977 but this edition is not simply a reprint. The text has been revised to reflect information that has been released in the interim, not least that concerning ULTRA. The book does contain a few typos; '2,000' mph, for instance, on p13 should surely have been '200' and 'tared' for 'tarred' on p128. These are mere quibbles, however. The text is comprehensive, coherent and, above all, easy to read. Furthermore, the 160-odd photographs (plus sundry maps and diagrams) are embedded within the text so that they appear adjacent to the passage which they illustrate. Buy this one.

**CGJ**

**Hornchurch Scramble. The definitive account of the RAF fighter airfield, its pilots, groundcrew and staff. Vol. 1. 1915 to the end of the Battle of Britain** by Richard C. Smith. Grub Street; 2000. Price £17.99.

I would hazard a guess that more books, articles, films, etc have been produced on the Battle of Britain than on any other single military encounter in history. Perhaps we might say that never in the field of human conflict has so much been written about so few! This book adds its quota to the total.

The emphasis which the Battle has received stems from several factors. Firstly there is its importance in the history of this country but



there is also the fact that it was fought by relatively few men over a short period and therefore lends itself to three types of historical writing which are not so easily accessible when dealing with a force as large as, say, Bomber Command, operating over years rather than months. One of these is summed up by the term antiquarianism, the second by a less familiar word, prosopography and the third by oral history. The antiquarian follows an honourable tradition in carefully assembling facts and figures. If we want to know about times, dates and places he will provide us with reliable information. The prosopographer asks not what the guys did, but rather who the guys were. Too many guys make his task difficult, but a couple of thousand Battle of Britain pilots are manageable. The oral historian goes in for interviews and his sources are men and women - with their inevitably fallible memories.

Richard C Smith's first volume of a history of Hornchurch, from its early days of Zeppelin-bashing until the end of the Battle of Britain, combines antiquarianism - in its well-marshalled facts - with a lot of oral history. The latter is used effectively in personal accounts which cover the whole period of the book and especially the Battle of Britain - to which some 50% of the text is devoted. The author has done his work well and his pre-Battle treatment deals with WW I and inter-war topics which deserve an airing. However, once the Battle starts then if the title were to refer to any 11 Group sector station I guess the contents would provide a pretty similar, and by now rather familiar, picture.

**Dr Tony Mansell**

**Richard Hillary. The definitive biography of a Battle of Britain fighter pilot and author of *The Last Enemy*** by David Ross. Grub Street; 2000. Price £20.00.

We might ask, was Richard Hillary a typical Battle of Britain pilot? My answer would be that there is really no such animal. Apart from the men of European nationalities and the Dominions who flew in the Battle, its pilots came from a wider spectrum of British society than is generally appreciated - ranging from the Public School/Oxbridge origins of such as Hillary to men who had left their council elementary schools at 14 and gained what qualifications they needed from night schools. Nevertheless, Hillary's experiences contain elements which

were typical of the Battle itself. He fought hard and, in his short battle life of eleven sorties – all flown from Hornchurch - became an ace with five '109s and three more as possible to his credit. His terrible injuries and protracted treatment at East Grinstead place him among those who suffered in a particularly appalling way and his unfortunate death as he tried to return to operational flying puts him in the company of others who overcame their injuries and were able to resume useful and active lives.

What makes Hillary really untypical is the book he wrote about his experiences - a book which has true literary merit and is in a different class from the general run of memoirs of the Battle. As the author notes, without *The Last Enemy* Hillary's name would be simply one more amongst those of the pilots who flew in the Battle.

This biography provides an almost blow by blow account of the whole of his short life and, to its credit, does not pull its punches at times. Hillary's poor start as a pilot at Oxford, his arrogant manner, his womanising and his unpopularity with some are all revealed here. Knowledge of these imperfections helps in understanding the mentality of this complex man who saw the fighter pilot in the role of the medieval knight, challenging his adversary in mortal combat and either living or dying cleanly in the process. That all his victories were over '109s, the most dangerous adversaries in the Battle, perhaps shows the playing out in practice of his idealism; but his end was not the clean one of his imagination by any means. David Ross has done a sound job in constructing his narrative from a mass of documents and from the personal reminiscences of fellow pilots and others who knew Hillary in all walks of his life and were in positions to make informed comment. The reader will know the facts of Hillary's life better after reading this book. Whether he will relish the detail will depend on where his interests really lie, in the subject himself or in the contexts in which he lived.

**Dr Tony Mansell**

**Jiri: The Story of Spitfire R7218** by Vic Hall. Country Books, Courtyard Cottage, Bakewell, Derbyshire DE45 1NN. Price £5.95.

This 48-page booklet tells the story of an aircraft, bought by the people of Retford and District in response to one of the wartime 'Wings for Victory' appeals, and of its Czech pilot Jiri Macacek. Both

were lost on 8th July 1941 when flying with No 145 Sqn. This is a thoughtful tribute not only to Jiri, but to his many countrymen who served with the RAF.

### **Roy Walker**

**Spitfires Over Sicily** by Brian Cull, with Nicola Malizia and Frederick Galea. Grub Street; 2000. £17.99.

The publisher's blurb for 'Spitfires Over Sicily' says that the book provides a day-by-day historical account of Malta Spitfire operations, leading up to and during the invasion of Sicily. The British, Italian and Maltese co-authors live up to this promise. The text, generously embellished with up to 100 photographs of Spitfires, their pilots and adversaries, takes the reader from the start of 1943 right through to the moment when a formidable anti-aircraft 'flak' barrier made an Axis 'Dunkirk' possible.

The strength of this book is also its greatest weakness. Cull, Malizia and Galea have amassed a host of facts and personal recollections that add greatly to the sum of our historical knowledge. But their sights are firmly fixed at the tactical level. There is no serious attempt to set the Spitfire operations within the overall Allied strategic political or air power framework, nor any analysis of the effects of politics or the impact of other theatres such as the Eastern Front on the quality of Axis aircraft and trained crews. Finally, the index leaves much to be desired. It consists simply of names of Allied and Axis personnel, which is fine as far as it goes but it does nothing for those who want to refer to places or units.

In other words, this book is a detailed catalogue of individual operations that becomes wearing after a bit. It is a worthy source reference, but if you are after the big picture, you will need to look elsewhere.

**Wg Cdr Andrew Brookes**

## ROYAL AIR FORCE HISTORICAL SOCIETY

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

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

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

Membership of the Society costs £15 per annum and further details may be obtained from the Membership Secretary, Dr Jack Dunham, Silverhill House, Coombe, Wotton-under-Edge, Gloucestershire. GL12 7ND. (Tel 01453-843362)

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