

**ROYAL AIR FORCE  
HISTORICAL SOCIETY**



**JOURNAL**

**44**

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**CONTENTS**

REFLECTIONS ON HIS TIME AS CHIEF OF THE AIR STAFF, 1992-97 by Air Chf Mshl Sir Michael Graydon GCB CBE FRAeS	5
SUMMARY OF THE MINUTES OF THE TWENTY-FIRST ANNUAL GENERAL MEETING HELD IN THE ROYAL AIR FORCE CLUB ON 25 JUNE 2008	20
FROM CONINGHAM TO PROJECT CONINGHAM-KEYES: DID BRITISH FORCES RELEARN HISTORICAL AIR-LAND CO-OPERATION LESSONS DURING OPERATION TELIC? by Wg Cdr H Smyth	23
A LETTER FROM 'BOMBER' HARRIS	64
TIGER FORCE AND FLIGHT REFUELLING by Brian Gardner	68
BOOK REVIEWS	99

**OUR GUEST SPEAKER AT THE RAF CLUB, FOLLOWING  
THE SOCIETY'S AGM ON 25 JUNE 2008, WAS**

**Air Chief Marshal Sir Michael Graydon GCB CBE FRAeS  
WHO WAS INVITED TO REFLECT ON HIS TIME AS CHIEF  
OF THE AIR STAFF, 1992-97.**

I sat down to put pen to paper for this talk on the balcony of my cottage in Cyprus looking out towards Mt Hilarion, Kyrenia, the Mediterranean and Turkey. It is some view, and I confess that concentrating on the job at hand was a struggle.

It seems that written revelations, accounts of events past, are in vogue: Cherie Blair, John Prescott, not long ago Alastair Campbell; Tony Blair is at it and, of course, Mike Jackson. I have never kept a diary. I have considered it, and indeed at one period of my tenure as CAS, I did consign to paper a record of certain events. I put it away safely, and when I came to leave Kingston House a year or two later, it was not to be found. Either MI5 had got it, or my splendidly efficient House Manager had found the jottings in a drawer and consigned them to the bin in the spirit of 'out with the old'. So much for my literary ambitions. As they contained some fairly forthright comments on certain personalities, subsequent discovery might be interesting.

But that is some way from writing one's story and I have long thought that many who do run the risk of seeking to justify their actions or even rewriting history – emphasise the good; economise on the bad. Some perhaps end up diminished in the eyes of the public and, more dangerously, in the eyes of those whom they have led.

So, if my dates are hazy, my memory faulty and I, too, fall into the trap of self justification, I apologise, but remember you asked for it.

What I will try to do is take a broad sweep through my 4½ years in post; set the scene as I found it on taking over as CAS in early November 1992; outline my aims and objectives at that time; recount the events which inevitably affected those objectives. Harold Macmillan's famous reply to the query as to what had influenced his time as PM most – 'Events dear boy, events' – was in my case prophetically apt.

And finally, I will describe the equipment programme and its

vicissitudes because, of the various legacies a CAS can leave to the Service, the equipment programme is most likely to have the greatest affect on its long term health. The long lead times and lengthy in-service period of modern equipment means that the sins of the past will be visited on the future for good or bad.

I came to the post as an ex-CinC of both Support Command and Strike. Of the two, Support was the most revealing. Unsurprising, because my background had been in Fighter and Strike and I knew, or thought I knew, a fair bit about that organisation.

Support was new. An integrated HQ with Training, Maintenance, Administration and many DAUs (Directly Administered Units). Some 200 or so units scattered over the UK and abroad; 40,000 plus personnel – military, civilian and contractors – and the RAF lead for the New Management Strategy (NMS). To remind you, NMS was delegated budgets; a good strategy which offered incentives to commanders at all levels.

Moreover, Support Command was beginning the major changes post-Cold War: the closure of many bases; the focus on centres of excellence and the introduction of further civilianisation and contractorisation. It raised issues. Our small bases were becoming blue-suit wastelands. Sports and activities were badly affected. Was this the environment in which to cultivate a Service ethos?

In parallel, Ken Macdonald, the 2nd PUS and David Omand, the rising star of the MOD, were conducting the study into decentralising from MOD in London – the Prospect Study. In it the PPOs (Principal Personnel Officers) and PSOs (Principal Supply Officers), AMP and AMSO for the RAF, were to be relocated as CinCs outside London as Personnel and Training, and Logistics, Commands. Support would disband; Strike would assume a number of MOD roles; RAFG was to disband too, with residual units coming under Strike Command, and so on. Whatever its merits, it was the Roman General's cry writ large: 'Every time we were organised we were re-organised ... and so on'. And this obsession with re-organisation would go on, and on, and on.

Strike Command was largely immune from this at the time I took over. Its operational tasks were to recover from the Gulf War – to disband the squadrons that had performed so well in that war, but were now considered unnecessary under the Options for Change study; this of course had been initiated post-Cold War but pre-Gulf War; and

then, within four months, Strike Command squadrons would be back out to the Gulf for the No Fly Zones, North and South, over Iraq.

We fought and gained, too, the formation of AFNORTHWEST (*a NATO Regional Command collocated with Strike at High Wycombe and the successor to the previous HQUKAIR. Ed*) under a 4-star airman in the face of strong challenges from the Navy at Northwood.

But the budget challenges meant some further big changes. Absorb the tasks from MOD; we devised and proposed massive changes to the Air Defence (AD) posture of the UK and we debated at length the best Command/Group structure for the new era. Centralise, or decentralise as NMS would dictate? We can come back to this, but I mention it now because these experiences, and my NATO pedigree, were the foundations for my views, or possibly prejudices, when I took over the RAF in November 1992.

What did I find? A Service grappling with all these issues certainly; one which, despite the ongoing one-third reduction in the front line, was still some 90,000 strong and had avoided a redundancy programme which might have arisen under Options for Change. In one sense this was good; in another, the view was widely held, by the other Services in particular, that the RAF had had got away with Options. Add to this, the wide recognition, that Air Power had been the key to success in the Gulf War, which I confess we were not slow to exploit – in retrospect too much – then the knives were out for us if the chance arose.

There were other agendas being peddled. My first meeting as a COS was with the FCO whose mandarins were advancing the view that post-Cold War and now Gulf, future conflicts would more likely be small scale and peacekeeping with soft power as important as hard power and the Services could be re-structured accordingly; the blue beret syndrome. We told them forcefully that retaining the spectrum of war fighting capabilities would allow us to carry out all these functions, being a militia would not. But the thought was there and I have no doubt it was transmitted widely, not least to the Treasury.

Then there was NATO. To adapt a saying, ‘An organisation that had lost an Empire and not yet found a role.’ But it was reinventing itself steadily towards Out of Area (OOA) and Expeditionary structures; the question was, would nations pay the premium in the unseemly rush to disband their armed forces and take the peace

dividend?

And finally, the political landscape. The Major Government, with a narrow majority, not having really won an election but rather able to capitalise on the public perception that Labour was still led by unelectable personalities. It was a Tory Government beset by ‘big beasts’ most of whom thought they could do a better job than the PM.

In this light, what were my principle aims and objectives for my tenure?

I knew that we could not sustain our present blue suit numbers. So did my predecessor and he had set up the Roberts Study to map out the future manpower requirements of the RAF. It was in its infancy and in Andrew Roberts we had a man of great ability who needed little encouragement to press on all the boundaries of change – centralisation, civilianisation, contractorisation, etc – but to ensure a coherent and robust career structure across the Service. All of this information would be digested and we would then decide on how far we could go, and the timing. This then was a major objective.

Next, to bring a better balance in the equipment programme between platforms and weapons. No doubt, CASs and CAs (Controllers Aircraft) for generations had tried to do this and I accept that without platforms you have nothing. But for too long, in my view, weapons which had increasingly long lead times had been sacrificed on the budgetary altar either in numbers or in capabilities. Getting this right was a priority.

I had other ambitions: building on our relationship with the USAF; improving the understanding of the importance of Turkey in NATO and Europe; finding a better answer to the stop/go of pilot training numbers. But, the RAF post-Cold War, size and shape, and platform/weapons harmonisation, were to my mind real key goals. Get these right and the Service would have sure foundations for the future.

But – ‘Events, dear boy, events.’

It wasn’t long before the Government were looking for further savings from defence. We were still digesting ‘Options for Change’ when ‘Front Line First’, or ‘Defence Costs Studies’ (DCS) as it became known, was launched.

Throughout 1993, articles were appearing in the press comparing the RAF with the Israeli Air Force – unfavourably of course. The source of these articles is now, I think, pretty well known but I suspect

at the time the influence of special advisors to Ministers was not fully appreciated.

Today, the role of special advisor is much associated with such as Alastair Campbell, but the Conservatives led the way, at least in the Defence Secretary's office.

Let me say, for the record, that by and large the motives of those involved in this campaign were always to improve, as they saw it, our defence capability – the RAF in particular. Cut out waste; improve the equipment programme; sharpen our operational posture – admirable. The problem was that the Government, and certain individuals in particular, saw defence savings as their passport to higher office and more generally to a re-election opportunity through deploying this money in vote-winning ways.

Moreover, these savings, it was suggested, could come from the RAF which had too much manpower, a wasteful training system and was, to use a recent term, 'unfit for purpose.' Savings from a major re-organisation would fund the equipment programme.

I was made aware of this quite early. As always, there were elements of truth and shafts of sunlight in the scattering of facts and assertions. But, it was not a Service I recognised, nor did it take account of the far-reaching work in hand in Roberts or in Support Command as I have described. Moreover, a central proposition was that a redundancy programme, generous but immediate, of up to 30,000 servicemen and women was in the best interests of the RAF. This was not something I could contemplate. In my judgement, it would have destroyed at a stroke the trust between the leadership and the Service which had taken many years to fully recover from the notorious redundancy programme of the 1970s. Nor, of course, was there any guarantee that money saved would actually benefit the RAF.

Nevertheless, Ministers were seized with the opportunity, and to the eighteen or so individual studies into training, support, organisation, medical, etc was added a study into the RAF. I was asked to agree to this, and said only if parallel studies were carried out into the Army and Navy by independent sources and to the same depth. This, in theory, occurred but it was the RAF that was the target, mainly because the study had already been trawled in front of Ministers who believed that the climate being generated would enable them to get away with such blatant selectivity.

Throughout the period of DCS, its conception, gestation and delivery, a series of events beset us: Peter Harding's resignation; the fuss over the cost of maintaining senior officers' 'residences'; the death of John Thompson; and the loss of the Chinook on the Mull of Kintyre. You will remember them, and in some cases the vicious press articles timed often to coincide with announcements of bad news for the RAF arising from DCS. On the very day we buried John Thompson, a major article attacking the Air Force appeared in *The Times* which had fingerprints all over it.

I will not go further into these events now, apart from the death of John Thompson. The opportunities for command and the training ground for future high rank were increasingly diminishing in the 1990s. You may remember a time when the RAF had some nine commands in the UK and four overseas; in 1992 we had, at 3-star and above, only six posts and this was on its way to five. I have not included the NATO posts. The loss of John Thompson threw a major spanner in the works of 'top plot'. It took some time to get it back into kilter and this was further compounded by the uncertainty of central staff appointments which previously had been 'Buggins turn'. Actually, I do not remember any Buggins turn incumbent letting the side down, but in the new world these appointments were now to be fought over, with all that this entailed for career planning. I suspect that today is a total nightmare for any coherent plot if a joint post is part of the pathway, which ideally it should be. As an aside, it was at this time that the 5-star post was lost and later I had the distinction of being the first COS to retire to 4-star rank.

But back to DCS. I believe we saw off its worst excesses for our Service. How?

First, the work already in hand was more convincing than most of the propositions in DCS 19 in the flying and ground training fields. The skills of John Willis and his excellent team at Support Command held off the barbarians. Indeed, they caused the first rift in the ranks of DCS 19. Secondly, Roberts spoke for itself. We were already aiming for a uniformed service of less than 60,000 with centres of excellence, further civilianisation and contractorisation and the closure of yet more bases. The only real issue was timing.

And finally, on that infamous day when Ministers took the three service studies in one afternoon, in a packed COS room, during which

the RAF inquisition lasted for approaching three hours and the other two Services were cantered over in under an hour, we held them off. A Minister with a sense of history, and not at the time a fan of the RAF, said afterwards, 'This was your finest hour.'

In the context of attacks on our service post World War II, it was, I think, a major achievement. By the end of the afternoon the PUS and certain central staff were arguing on our side. I was immensely proud of my team and its measured response to the wilder assertions and attacks on our record.

I apologise if I appear to have spent an unseemly amount of time on DCS, but this event and its ripples were to be the most disruptive influence on my time as CAS. And it is not to say that we did not sustain some hits; we did, but we came through them pretty well under control and not marching to a tune over which we had little influence. Delivering the outcome of DCS – the two major redundancy tranches – was to occupy us for much of the remainder of my time as CAS. I believe it was well done. We bought time; we argued for, and won, a voluntary redundancy scheme before embarking on the carefully structured compulsory programme; we accepted the possible disturbance to the career pyramid and, to give the Government its due, the redundancy terms were generous – eighteen month's tax-free severance pay and one year's notice.

I have not mentioned the Bett Study, which was introduced by the Government at the same time; it was to be a fundamental study into personnel, rank structures and so on. Its timing was awful, but luckily the other Services were subject to it just as we were and I could be reasonably confident that they would be more reactionary than ourselves.

A last word on DCS; the amalgamation of the Staff Colleges is one thing you might wish to discuss later; but, the Medical Study, DCS 15, was, I think, one outcome which has been universally criticised. We were all exhausted; it was the last one and, although we in the RAF had been more outspoken against it than the other Services, we had to keep our ammunition primarily for DCS 19. All of the COSs of that time would, I think, acknowledge that we took our eye off the ball just before stumps were pulled.

Now a canter through other things. The No Fly Zone over Iraq, North and South, continued; despite my concerns over being trapped

in Bosnia/Croatia, we went ahead and eventually its course demanded air power presence and utilisation. This was a time, to my mind, when the other Services, primarily the Army, saw an opportunity to regain the limelight after the Gulf War – muscular peacekeeping; Special Forces and so on. Air power, so it was said, had nothing to offer in this arena. It took the humiliation of the Dutch at Srebrenitza and other blatant acts by the Bosnian Serbs to show that our excellent ground forces could not, without massive reinforcement, police the area required. It was the start of a debate that still goes on today. Wise men recognise that the ebb and flow of warfare brings with it prominence for ground forces with air in support, just as it brings prominence for air forces with ground in support. But, most importantly, all the Services need to operate with the full knowledge of each other's capabilities and plan to use them rather than wait for crisis; avoid what Glenn Torpy calls 'the 999 syndrome'.

Our relationship with the USAF remained strong, built on the Cold War and enhanced in Gulf War I. But there was a danger that the massive changes in NATO, an organisation once critical to USAF career building, would mean that we would no longer have the close foundation which had fostered our relations. The USAF young were looking increasingly to the Pacific to get the 'joint and international' tick in the box necessary for promotion. Inevitably we would lose touch with them.

So, with Ron Fogleman, then the USAF COS, we set up opportunities for some of our 1- and 2-star bright hopes to meet, converse and get to know one another in small conference mode. Such actions and, of course, the continued operations in the Balkans, and now Afghanistan and Iraq, have ensured that the air force to air force and personal relations remain very strong. CAS has certainly majored on this aspect.

And finally in this section – Turkey, a subject close to my heart. Taken for granted, neglected, patronised and then expected to deliver, it was obvious to any balanced strategic thought that this long-standing and strong NATO ally was the key to stability in the most volatile region in the world. We engaged the FCO and I would like to think had some influence in seeing a steady change in foreign policy in the 1990s – one which supported Turkey in its aspirations to join the EU and improved relations with this much misunderstood but

staunch ally. I was able to include Turkey in the formation of EURAC (European Air Chief's Conference) despite French attempts to make it an exclusive inner circle of European states.

And so to the equipment programme. You may recall that balancing better the platform/weapons equation was a key aim for my time. But the first challenges arose from the cost overrun on the Tornado GR1 to GR4 upgrade programme. Not until some £400M of overrun had emerged on this £900M programme was the matter given a real airing at my level. There was a real danger of its being cancelled. Something had to give. At a long session in my office with ACAS, Tony Bagnall, the key PE (Procurement Executive) men and OR (Operational Requirements) we thrashed out a solution which removed one of the capabilities and brought the programme back into order. The lesson on involving the Service earlier was obvious. I hope that is done now; it didn't seem to be the case a few years ago.

Eurofighter (EF). This was rocky. The Treasury were against it, even though, as a collaborative programme, there would have been major difficulties in cancellation. The Government appeared to be for it industrially and politically, but how many, and what combination of AD and multi-role was uncertain. And there were forces at work to scotch the programme and buy American.

One morning I got a phone call from my Italian counterpart. 'I need your help', he said, 'My '104s are falling out of the sky; EF is years away; the Americans are offering F-16s for peanuts and, if we accept, we will never get EFs. We need some Tornado F3s to stem the tide.' I could see this was indeed a crisis. And the MOD Building, or at least the RAF part of it with support from the SofS, dealt with it superbly. Much credit to Tony Bagnall and the team which unearthed the aircraft from store, refitted them, set up a training system and delivered the first F3 in a record time. I believe this effort saved the EF programme from a major setback. But, later on we, too, were under pressure to introduce F-16s to compensate for the deficiencies of the F3. There is quite a lot to be said about this particular campaign but, suffice to say, that it sparked in response the Tornado F3 Capability Sustainment Programme (CSP) which not only saw off the F-16 advocates at lower cost but made the F3 one of the most effective all-weather AD machines in the world for its last years in service. Great work by the RAF team and especially Steve Nicholl.

- The EH101 (*aka the Merlin*) was a major event. It was pushed hard by Ministers and Civil Servants for industrial purposes; our priority was lift, which demanded additional Chinooks. In the end, Ministers gave way and agreed on a mixed fleet, and they were forced to admit, in the light of extra costs, that they had given direction on the EH101; in short, our steadfast position maximised the lift element, and at the same time provided adequate 101s to address the missions where it has an operational advantage. All of us understand the industrial and political consequences of procurement decisions but making the defence budget pay for these matters cannot go unchallenged.
- In C-130J (*the second-generation Hercules*) we were the lead customer, and set the pace on performance/software and standards of equipment. Its subsequent delay was disappointing but it seems to be giving outstanding service today.
- Back to Eurofighter for a moment; we got to a Production Contract, and, very significantly, boomed off those who wanted to go for a contractor-controlled Support Package. By insisting on a Service-rich blend of contractor/organic, we retained our deployable capability. The model has, of course, also survived on other platforms, not least because of our stance on EF.
- Replacement Maritime Patrol Aircraft (RMPA); you will recall the three options: a P-3 Orion from the desert, with no airframe records (despite being cheap and therefore attractive to the Treasury, quickly abandoned!); a new P-3, primed by Lockheed Martin, with GEC mission support avionics; Nimrod MRA4. Lockheed Martin could not match the early years resource profile; BAE Systems said that they could! Obviously, the risk had not been costed properly, with consequences today on both in-service date and numbers.
- Weapons; principally CASOM (Conventionally Armed Stand-Off Missile) and an Anti-Armour Weapon (ASRs 1236 and 1238). This was quite a battle. The Army argued for a more direct-fire anti-tank weapon, the RN for more TLAM (Tomahawk Land Attack Missile), suggesting no RAF requirement, which would have raised serious doubts about Harrier/Jaguar/Tornado GR1 replacements, and could have halved the front line strength of the RAF. We won

the day after a gruelling six months of OA (Operational Analysis), argument, cajoling, pleading, and both Weapons and RMPA were announced as a package by Michael Portillo in 1997 after taking on the Treasury over ASR 1238; I believe that this positioned the RAF as a force capable to meet future HIC (High Intensity Conflict) challenges, and it was key to an Air Force capable of strategic independent action.

- Ancillary Equipment: new Ground Radars, capable of deployment; Digital Data Links – the Tornado F3 was the first AD aircraft in the world to be fitted with Link 16, with astonishing impact on its operational credibility, as I have mentioned; Harrier GR7/9 upgrade (new weapons and avionics); Future Strategic Tanker Aircraft (FSTA) OR firmed up; Future Offensive Air System (FOAS) and Joint Strike Fighter (JSF) ORs written, confirming the need for the manned element of future offensive ops; Unmanned Aerial Vehicles (UAV) were recognised as a likely future element of ISTAR (Intelligence, Surveillance, Target Acquisition and Reconnaissance) and OA; all this laying the groundwork for the NEC/NCW (Network Enabled Capability/Network Centric Warfare) concept of today.

Overall we consolidated and achieved a first class programme, and its foundations were built upon and developed by Dick Johns and Peter Squire with great success. Let me also record the debt we owe to Chris Coville and his team for their strong and effective advocacy over much of this period.

Regrets over that turbulent 4½ years? Plenty of course. We were never able to really sort out the maintenance cost-effectiveness equation, despite gallant efforts. Perhaps we might have done if we were not so busy being re-organised.

The loss during our drawdown of some superb young airmen, not in redundancy, because they were not eligible, but they could have expected to be signed on for further service. And they were mad keen to do so. I hated losing such fine people. Failing to convert Max Hastings, although we did establish a good relationship with John Keegan. And other things to regret too; but perhaps for later.

I have almost certainly spoken for too long but 4½ years is not easy to cover in 30 minutes. History will make its own judgements but I

remain proud to have had the privilege of commanding the Royal Air Force from 1992 to 1997. With magnificent support from many people and under intense challenge, we not only managed a major drawdown from 90,000 to 58,500, saw off the more extreme and risky ideas being canvassed, but laid down the foundations for the well-equipped, flexible and highly effective Service we have today.

## QUESTIONS & ANSWERS

**Wg Cdr Andy Brookes:** Every now and then, someone will say, ‘Why doesn’t CAS, or CGS or whoever, resign over this?’ – whatever the currently contentious ‘this’ happens to be. I doubt that it would make much difference myself, but could you share with us your thoughts on the pros and cons of resignation?

**Air Chf Mshl Sir Michael Graydon:** I remember, when I was at Staff College, someone asking Sam Elworthy, who was then Chief of the Defence Staff, much the same question and I thought that the answer he gave was very apt. He said that, when you are faced with this sort of decision you have to ask yourself what would you be resigning *for*? Is it hubris? Is it just because someone has done something that you don’t like? Ultimately, you have to ask yourself – if I were to go, would my successor be able to deal with the problem any better than me? If you were able to orchestrate a wholesale resignation, that would probably have some impact, but I don’t think that the departure of an individual would ever make much difference. Take the example of the Navy and the cancellation of the carriers in 1966 – the First Sea Lord and a Minister resigned but it had no effect on the decision and within a year or two most folk had forgotten their names.

So, to answer your question. – I suppose that if you simply cannot accept a change in policy – or have totally lost confidence in a government – then you would have to go. But I don’t believe that it would have the slightest practical effect.

**Wg Cdr Jeff Jefford:** This is probably a naïve question, but you would have had a Minister for the Air Force. What was his brief? Was he there to help or to hinder?

**Graydon:** We don't have one any longer, although we did at one time and I think that they were probably a good thing. Did you have one Michael?

**MRAF Sir Michael Beetham:** Yes, I did – and they were a good thing; they could be very helpful in getting decisions taken.

**Jefford:** Perhaps that's why they had to go . . .

**Gp Capt Jock Heron:** Few, if any, of the politicians and Whitehall mandarins who administer today's Services have ever worn uniform. How difficult is it for the Chiefs to get the government and the Civil Service to understand the culture of the Services and what it is that makes our men and women respond 'above and beyond the call of duty' when circumstances so dictate when the society in which we live is motivated by far more material things and the cult of the celebrity?

**Graydon:** I think that if I actually knew the answer that one I would probably have been better off pursuing a different career!

But I will offer two thoughts. One is that we are currently fighting two campaigns and we need to take advantage of the opportunity that this presents. It is far more difficult to hold the attention of ministers when your forces are not engaged. When you are actually fighting a war, and people are dying, you can exert real leverage.

The other thought is that, so far as the public is concerned, I believe that the root of the problem lies in ignorance, rather than an 'anti' attitude and at least some parts of the press are currently raising the profile of the military by focusing on what servicemen are doing and thus creating a better understanding of what is going on in Iraq and Afghanistan. As a result, even if people do not support the war in Iraq, they do appreciate what our men and women are doing there – and they are even quite proud of them, when they actually think about it. The challenge is to get them to think about it.

Our problem today is that our 'footprint' on the country is so small. Once upon a time we had airfields, army camps, naval bases and other military installations everywhere, with their people integrated into the local communities. Compare that with the size of our forces today and the way in which we have been obliged, for budgetary reasons, to contract and concentrate our facilities – and here, of course, I have to plead guilty to having contributed to this process. But while these

developments may have yielded economies and increased efficiency, there has been a hidden cost and we definitely lost something in our reduced presence. Which is why uniformed organisations, like our own Air Training Corps, are so valuable to us. We just have to keep plugging away at this, but the current Chiefs are clearly in the strongest position that they are ever going to be in and I do hope that they are taking all the advantage of it that they can.

**Graham Stagg:** I spent most of my career dealing with aspects of Flight Safety and I wondered whether, despite the media storm and the political involvement, the Mull of Kintyre incident had any tangible benefits in the overall context of Flight Safety.

**Graydon:** I would like to think that people will have acknowledged the honesty underlying the conclusions that were drawn. One of the points that was made, repeatedly, was that, if we could have avoided drawing our eventual conclusion – blaming the pilots – we would have done it! Why would we have *wanted* to lay the blame, on anyone, if it could have been avoided? But there simply was not the slightest doubt in any of our minds – and we faced up to it. I remember going to see Ministers at the time to inform them of the conclusion that had been reached. I explained that it had been tested by all manner of agencies and individuals, all of them experts in the field, some having no vested interest in the matter, and we had *all* reached the same conclusion – and it was not a happy one. But, we were putting our hands up and saying, ‘We got it wrong’. It was the honourable, the honest, thing to do, and I think that my colleagues, the other Chiefs, admired our courage in doing it, even though the Army and the Security Services had lost a lot of first class people themselves in that incident. It really was a disaster. If we had tried to fudge the issue, perhaps to say that we simply didn’t know what had happened, or had in any way resorted to obfuscation, I think that we would have forfeited our credibility. By being honest and acknowledging that ‘we got it wrong’, our credibility was enhanced.

So – yes – I think that there probably was a positive spin-off in terms of Flight Safety in that confidence in the system was reinforced. Despite the furor, we had letters from ordinary folk expressing sympathy for the *Flak* that we were taking at the top because they knew that we were right in our judgement. I know, of course, that

there were guys in the helicopter force who felt that it was simply wrong to blame people who were dead. I quite understand that, and if I had been serving at that level at the time, I would probably have taken the same position myself. But when you are actually faced with the problem – at the top – when *you* have to decide – you have to take all of the factors into consideration and then make an honest judgement. And that is what was done.

**SUMMARY OF THE MINUTES OF THE TWENTY-SECOND  
ANNUAL GENERAL MEETING HELD IN  
THE ROYAL AIR FORCE CLUB ON 25 JUNE 2008**

**Chairman's Report.**

AVM Baldwin noted that the Society had held two seminars since the last AGM. The first, at the RAF Museum, Hendon in October, covered the history of RAF Aviation Medicine, while the second, held at BAWA in Bristol, covered the history of the Canberra in RAF service. This will be the subject of a hardback publication, not least because of the generosity of Rolls-Royce, BAE Systems and Cobham PLC. The next seminar would be on Wednesday 22 October 2008 at the RAF Museum when unguided conventional weapons will be the topic.

Three journals were distributed during the year, the latest of which covered the minutes of last year's AGM, Anthony Furse's post-AGM lecture about his uncle, Air Chf Mshl Sir Wilfrid Freeman, and several papers of interest to members. We also published the eulogy to Air Cdre Henry Probert delivered by the Head of the Air Historical Branch at Henry's funeral in January. Having conceived the idea of the society Henry was a founder member and had a major influence over its affairs. His wise counsel and experience would be greatly missed. As the visit to Cosford did not lend itself to published proceedings, Journal 41 reproduced some seminal papers in the society's history, including the lecture that Professor R V Jones gave at the inaugural meeting in October 1986.

The finances of the society remained in good shape, and subscriptions would remain unchanged at £18. Although subsidised, seminar attendance would also remain at £15 per head. Thanks to the stalwart work of our editor, Wg Cdr Jeff Jefford, and the invaluable help of Dr Michael Fopp and his colleagues at the RAF Museum, the website had developed apace. Information about the next seminar, a downloadable membership form and, most importantly to historians, the entire published output of the society from 1986 to 2006 was now in the public domain via the web.

Concluding, the Chairman thanked the committee for their continued hard work on behalf of the society. The advice and encouragement of the President, Marshal of the Royal Air Force Sir

Michael Beetham, and the Vice-President, Air Marshal Sir Frederick Sowrey were especially appreciated.

### **Secretary's Report.**

Gp Capt Dearman noted that correspondence and queries were received throughout the year. Since the last AGM, thirty-nine new members had joined the society, of which sixteen were serving. Fifteen had died, and six had resigned leaving a total of 827. The sale of journals had raised £234.

### **Treasurer's Report.**

Mr Boyes tabled the annual accounts for 2007 which showed a surplus of £526 leaving a balance of £28,494 in reserves. The society had made grants of £500 towards research on the biography of MRAF Sir Michael Beetham, and £1,500 towards the funding of a PhD study at Imperial College, London, by Miss Hermione Giffard into the history of the development of the gas turbine engine. A proposal by Wg Cdr Cummings, seconded by Capt Ian Whittle, that the accounts be accepted and that J R G Auber Ltd be reappointed independent examiner was carried.

### **Appointment of Executive Committee.**

The chairman noted that all the executive committee members had offered themselves for re-election, and that Air Cdre Graham Pitchfork had agreed to stand for election in place of the late Air Cdre Probert. A proposal by Air Mshl Sir Frederick Sowrey, seconded by Wg Cdr Brookes, that Air Cdre Pitchfork be elected and all other committee members be re-elected was carried. The executive committee members so elected were:

AVM N B Baldwin CB CBE FRAeS	Chairman
Gp Capt J D Heron OBE	Vice-Chairman
Gp Capt K J Dearman FRAeS	Secretary
Dr J Dunham PhD CPsychol AMRAeS	Membership Secretary
Mr J Boyes TD CA	Treasurer
Wg Cdr C G Jefford MBE BA	Editor & Pubs Manager
Air Cdre G R Pitchfork MBE MA FRAeS	
Wg Cdr C J Cummings	

The ex-officio members of the committee elected were:

J S Cox BA MA	Head of AHB
Dr M Fopp MA PhD FMA FIMgt	Director RAF Museum
Gp Capt A J Byford MA MA RAF	DDefS(RAF)
Wg Cdr J M Dixon AFC MA BSc RAF	JSCSC

### **Discussion**

The Two Air Forces award had been won by Wg Cdr H Smyth for his paper comparing air-land co-operation in the Western Desert with Operation TELIC in Iraq. As he was unable to attend the AGM, the award would be presented at the next seminar.

Wg Cdr Ryan deplored the apparent loss of stored unit silver. There were suggestions that thefts might have occurred, but the inability to account for squadron silver was disgraceful. He advocated transferring any remaining silver to the custody of the RAF Museum, who already held the RAeC silver. AVM Dye noted that an additional curator would be needed and storage space might be difficult to find. Nevertheless, if a post could be funded, he would give consideration to the suggestion. Sir Michael Beetham noted that the matter should be taken up by the Air Force Board, and he would be willing to lend his support.

The Vice-President expressed his thanks for the work of the committee. There being no further business, the meeting closed at 1845 hrs.

*In 1996 the Royal Air Force Historical Society established, in collaboration with its American sister organisation, the Air Force Historical Foundation, the Two Air Forces Award, which was to be presented annually on each side of the Atlantic in recognition of outstanding academic work by a serving officer or airman. It is intended to reproduce some of these papers from time to time in the Journal. This one was the winning RAF submission in 2007. Ed*

## **FROM CONINGHAM TO PROJECT CONINGHAM-KEYES: DID BRITISH FORCES RELEARN HISTORICAL AIR-LAND CO-OPERATION LESSONS DURING OPERATION TELIC?**

**Wg Cdr H Smyth**

### **ABSTRACT**

In 2003, the British Army and RAF emerged from operations in Iraq with the realisation that their ability to conduct integrated air-land operations was less than adequate. Project Coningham-Keyes was subsequently instigated to resolve this issue. This paper compares the air-land lessons learnt from the North African Campaign of the early 1940s, with those of Operation TELIC in 2003, to answer the question, ‘did British forces relearn historical air-land co-operation lessons?’ Utilising both primary and secondary source materials, including archived manuscripts from World War 2, original debrief interviews from Op TELIC, and the latest draft material from Project Coningham-Keyes, this comparative study will demonstrate that, in 2003 in Iraq, contemporary British forces relearned identical air-land lessons to those of their North African Campaign forebears.

### **INTRODUCTION**

Operation TELIC, the UK’s contribution to Operation IRAQI FREEDOM, the conflict to liberate Iraq, lasted from 20 March to 22 April 2003.<sup>1</sup> Although Coalition forces emerged victorious, in approximately one month of warfighting the UK military exposed

<sup>1</sup> *Operations in Iraq: First Reflections*, (2003), p 42. On 22 Apr 03, UK area of operations was declared ‘permissive’ by UN for humanitarian operations to commence.

serious inadequacies in its ability to conduct, and understanding of, air-land co-operation. After TELIC, Air Vice Marshal Torpy, the UK's Air Component Commander (ACC) for the Operation, commented that, 'There is no doubt that we need to do more air-land integration. I believe there are lots of lessons that we have learned out of this particular campaign in terms of the core skill that air-land integration should form for all our fast jet aircraft'<sup>2</sup>.

Although British aviators have been providing air support to ground forces since World War I (WW I), there were still many mistakes made in this domain during TELIC. This paper asks the question, 'did we relearn historical air-land co-operation lessons?' To answer this, a comparative study will be completed between the North African Campaign of World War II (WW II), arguably the birthplace of true air-land co-operation, and TELIC. This comparison is relevant for three main reasons. Firstly, both campaigns were fought over similar desert terrain; therefore, lessons pertaining to operating environment can be discounted. Secondly, British forces entered each campaign ill prepared to conduct air-land operations. Finally, air-support doctrine utilised in TELIC was effectively identical to that developed in North Africa, since technology has had minimal impact upon contemporary British air-support methodologies.

A chronological examination of the North African Campaign will draw out the key British air-land lessons learnt, and demonstrate how these lessons were addressed. Briefly, the British successfully implemented two key enablers, which provided the springboard for successful air-land operations: gaining control of the air and centralised command of air-support assets. However, with specific regard to the implementation of air-land operations, three significant areas were lacking: command and control (C2) structures; training and doctrine; and tactical level situational awareness. During TELIC, British forces achieved identical successes and failures in the air-support arena to those of North Africa. Hence, it can be determined that British forces operating in Iraq in 2003, *did* relearn historical air-land lessons.

<sup>2</sup> Minutes of Evidence (Torpy), (2003), Question 1253.

## What Is It?

Current doctrine lists Anti-Surface Force Air Operations (ASFAO, or generically, air support) as a core capability of air power and defines it as either direct or indirect air operations that may be employed in the air-land environment. Indirect air operations are those intended to disrupt and destroy an opponent's military assets and infrastructure in the rear area whereas direct air operations are those intended to directly affect the outcome of a contact engagement between friendly and opposing forces. Direct air operations against an opposing force are normally conducted under the procedures for Close Air Support (CAS), which is defined as, 'air action against hostile targets that are in close proximity to friendly forces, and requires detailed integration of each mission with the fire and movement of those forces'<sup>3</sup>. During TELIC, the British implementation of CAS was most lacking.

## Why Study It?

In 1943 General Montgomery stated, 'If you can knit up the power of the Army on the land and the power of the air in the sky then nothing will stand against you and you will never lose a battle'<sup>4</sup>. In contemporary warfare, the success of air power in providing day, night, adverse-weather, precision air support for ground forces has convinced Army leadership that it can make its forces more deployable and agile by reducing its own organic fire support, such as artillery, and relying more heavily on air power.<sup>5</sup> This was reflected in Iraq in 2003: of 19,898 targets struck, over 15,000 were through CAS missions.<sup>6</sup> Moreover, as British forces suffer from defence cuts, it has become necessary for components to add weight of effort to the joint scheme of manoeuvre in order to maintain capability. All components operating in this joint arena must have a common understanding of each other's doctrine if agility (both in command and execution), tactical synergy and exponential capability are to be achieved. Integrated Air Operations, of which air support is a part, is one of the six core air and space power roles; hence, it must be studied and

<sup>3</sup> RAF Operations Manual, (2000), pp 5.III.1-5.III.2.

<sup>4</sup> TNA Air 37/876

<sup>5</sup> Pirnie *et al*, (2005), p 3.

<sup>6</sup> Isby, (2004), p 21.

understood.<sup>7</sup>

Since the end of the Cold War, there have been few real-world opportunities to test air-land co-operation within conventional operations.<sup>8</sup> Cold War joint air-land organisations, such as developed in 1 BR Corps in West Germany, were disbanded in the mid 1990s and not replaced. Hence, as stated by Air Vice Marshal Torpy after TELIC, ‘...we have forgotten some of the things we were quite good at during the Cold War...we have neglected the exercising of those [air-land operations] over the years.’<sup>9</sup> In 1940, the RAF similarly entered the North African Campaign poorly placed to conduct air-land operations. It is from this common baseline of ill preparedness that comparisons can be drawn.

## **THE NORTH AFRICAN CAMPAIGN AND AIR-LAND DEVELOPMENT**

### **Before North Africa**

During WW I relations between the RAF and the Army were relatively good. However, the period post WW I brought with it intense inter-service rivalry as the British government began a process of large-scale defence cuts.<sup>10</sup> The RAF was desperate to maintain its independent status and hence, grasped the doctrine of strategic bombing as a proclaimed panacea for future warfare. Therefore, with overshadowing budget constraints, the RAF set about developing both doctrine and aircraft that could support the strategic bombing principles whilst air-land integration lessons learned during WW I were largely sidelined.

In Air Ministry circles, there was a marked reluctance to take air-land issues seriously, with the official attitude being emphasised by the then Wing Commander J C Slessor in a series of lectures delivered between 1931 and 1934, in which his principle theme was that an aeroplane was not a battlefield weapon.<sup>11</sup> By the time Slessor became Director of Plans at the Air Ministry, he completely rejected the concept of air support, except in the event of an emergency. Even as

<sup>7</sup> FASOC, (2005), p 5-8.

<sup>8</sup> Grant, (July 2003), p 32.

<sup>9</sup> Defence Committee Third Report of Session 2003-04, (2004), para 101.

<sup>10</sup> Jordan, (2003), pp 67-73.

<sup>11</sup> Smith, (1990), pp 35-36.

late as 1941, he was continuing to argue that if invasion came ‘it would be fatal to have bombers scooting about Kent trying to shoot up individual tanks [...] I do not believe in close support at all,’ and unfortunately, this view was still widely held across the RAF.<sup>12</sup> It is against this backdrop that the development of air-land doctrine during WW II, and more specifically the North African Campaign, should be studied.

Having firmly rejected the concept of air support during the inter-war period, the RAF was inadequately equipped and poorly trained to conduct air-land operations at the beginning of WW II. During the German invasion of the Low Countries and France, army requests for air support had to pass through an unwieldy chain of command, involving assessment at both Army and RAF headquarters. The system proved completely inadequate to counter the rapid pace of German Blitzkrieg operations and broke down after German armour punched through the Allied Front and encircled the Anglo-French Armies.<sup>13</sup>

Conversely, German air-land warfare during the Blitzkrieg had been most impressive and inspired the British to concentrate its efforts in developing doctrine that would succeed in future air-land campaigns. What was noteworthy about the German campaign was its synergistic blend of firepower on the battlefield, termed *Schwerpunkt*, or ‘joint fires’ in contemporary parlance.<sup>14</sup> The Germans placed air-ground control teams in corps/divisional headquarters and with advancing infantry and Panzer units on the ground.<sup>15</sup> The overwhelming effect of German air-land integration is encapsulated in the following comment made by France’s Pierre Cot: ‘The Battle of France demonstrated the importance of air power in modern warfare; it proved that an army can do nothing without the support of an adequate air force’<sup>16</sup>.

### **Army Co-operation Command**

Defeat in 1940, and subsequent escape from the Dunkirk beaches,

<sup>12</sup> TNA Air 20/2970 (1941).

<sup>13</sup> Gooderson, (1998), pp 22-23.

<sup>14</sup> Luftwaffe General Staff (1938).

<sup>15</sup> Hallion, (1989), pp 145-148.

<sup>16</sup> Cot, (1944), p 274.

exposed the fundamental weaknesses of British air-land doctrine: insufficient contact between the Army and the RAF staffs, a situation exacerbated by dislocated positioning of their headquarters and the lack of a reliable communications and C2 network.<sup>17</sup> However, there is no doubt that the RAF made a definite contribution to the successful withdrawal to Dunkirk and eventual evacuation, despite Army claims to the contrary and subsequent renaming of the junior service as the 'Royal Absent Force'. Importantly though, the experiences of this campaign gave a powerful impetus to the development of an air-support organisation and resulted in the formation of Army Co-operation Command in December 1940.<sup>18</sup>

The true function of the RAF, according to the pre-WW II creed, was 'to generally create disorganisation and confusion behind the enemy front while the ground forces achieved their objectives'<sup>19</sup>. However, this philosophy had not worked in France and worse still, the contradictory German doctrine had been seen to work only too well. Hence, amidst continuing Army/RAF debate, Army Co-operation Command was formed, its purpose being to control policy, training and administration of all air-support matters. However, the AOCinC, Air Marshal Sir Arthur Barratt, had no operational responsibility and hence was excluded from discussions of policy in respect of such problems as the employment of bomber squadrons in close support.<sup>20</sup> Therefore, many saw Army Co-operation Command as a token effort to appease the Army during the post-Dunkirk depression and the situation in which Barratt found himself, did nothing for his quest to further air-land integration.

Nevertheless, during this same period, the Air Ministry sanctioned a number of air-support experiments and it was in Barratt's 'Cinderella' Command that some the most significant theoretical work on air-land co-operation was done. In September 1940, under the guidance of Colonel J D Woodhall and Group Captain A Wann, the 'Wann-Woodhall Report' was produced.<sup>21</sup> Bomber Command's Army

<sup>17</sup> Gooderson, *op cit*, pp 23-24.

<sup>18</sup> AP3235, (1955), p 22.

<sup>19</sup> Terraine, (1985), p 349.

<sup>20</sup> AP3235, *op cit*, p 25.

<sup>21</sup> Terraine, *op cit*, p 351.

Liaison Officer described it as:

‘a plan that was far superior to anything possessed by the Germans...for co-ordinating the action of forward troops and supporting bombers. It was a signals network which sent out ‘tentacles’, army officers in light cars, who went forward to the leading troops and signalled back requests for support, by wireless links that avoided the normal channels, directly to a control centre, where they were monitored by Army and Air Force officers sitting together. This shortened by several hours the time needed to lay on bomber action. After a period of adjustment in England, the controls were established as Army Support Signals Units (ASSUs)...one of the outstanding successes of the war.’<sup>22</sup>

Moreover, the system called for the joint staff at the control centre (ASSU) to evaluate air-support requests as they came in, checking the proposed target locations in relation to the ‘bomblines’. A deconfliction measure to reduce fratricide, the bomblines were based on a physical feature easily identifiable to both airmen and soldiers, projected forward of friendly troops, beyond which aircraft were permitted to engage targets. If the target was accepted by the ASSU, the squadron designated for the task was contacted via direct communications, and the Air Liaison Officers (ALOs) attached to the squadron were alerted to brief the pilots, who had then to identify their targets by means of photographic maps with grid references.<sup>23</sup>

Whilst this system was being developed in the UK, a parallel air-support system was being forged in North Africa. Unfortunately, due to poor communications with the UK, many of the theoretical lessons identified in the Wann-Woodhall Report were not promulgated to the desert forces; consequently, lessons were learnt the hard way in the tough test of desert battle.

### **North Africa 1940-41**

After the fall of France, Britain felt powerless against the might of Germany. However, Italy’s entry into the war in 1940, turned the Middle East into an active area of operations and provided a

<sup>22</sup> *Ibid.*

<sup>23</sup> Bidwell and Graham, (1985), p 265.

subsidiary theatre, where British forces could be employed to harass or even inflict some damage on the enemy. Churchill boldly reinforced the region even though the German threat to mainland Britain was far from removed. He resolutely declared that the British would fight for Egypt, describing the desert flank as the 'peg in the sand on which all else hung'<sup>24</sup>.

With Hitler's heart set on undertaking Operation BARBAROSSA on the Eastern Front, the British were once more able to indulge in their predilection for the indirect approach. They responded to Graziani's 10<sup>th</sup> Army's advance into Egypt in September 1940 and thus, the stage was set for a constant 'toing and froing' across the sands of North Africa for the next 2½ years. It would be upon this stage that the British 8<sup>th</sup> Army and the Desert Air Force (DAF) would hone the doctrine of air support.<sup>25</sup>

At the start of the Italian offensive, the British were in no position to counter attack. However, air support, in the form of reconnaissance and bombing, in conjunction with ground attacks on Italian strong points, ensured a safe withdrawal of British forces from the frontier. The primary air effort, which contributed enormously to the land battle, was attacks on enemy motor transport, in an attempt to disrupt the Italian supply chain and stretch lines of communication. Consequently, by mid September the Italian advance had stalled in the area of Sidi Barrani.<sup>26</sup> The prevailing RAF doctrine, which was doggedly anti air-land, defined air's primary role as action against the Italian Air Forces, their bases and supply lines; in effect, a strategic offensive.<sup>27</sup> Of the five stated objectives for RAF Middle East, 'full support for British Army operations' was listed fourth.<sup>28</sup> However, what the Italian advance had brought about was a recognition (which would become enduring) of what the RAF's main role in the Middle East should be: 'if the situation demanded [support to the Army] should be given *first* priority for as long as necessary'<sup>29</sup>. The Italian advance had denied the RAF forward operating bases, thereby

<sup>24</sup> Strawson, (1992), p 14.

<sup>25</sup> *Ibid.*

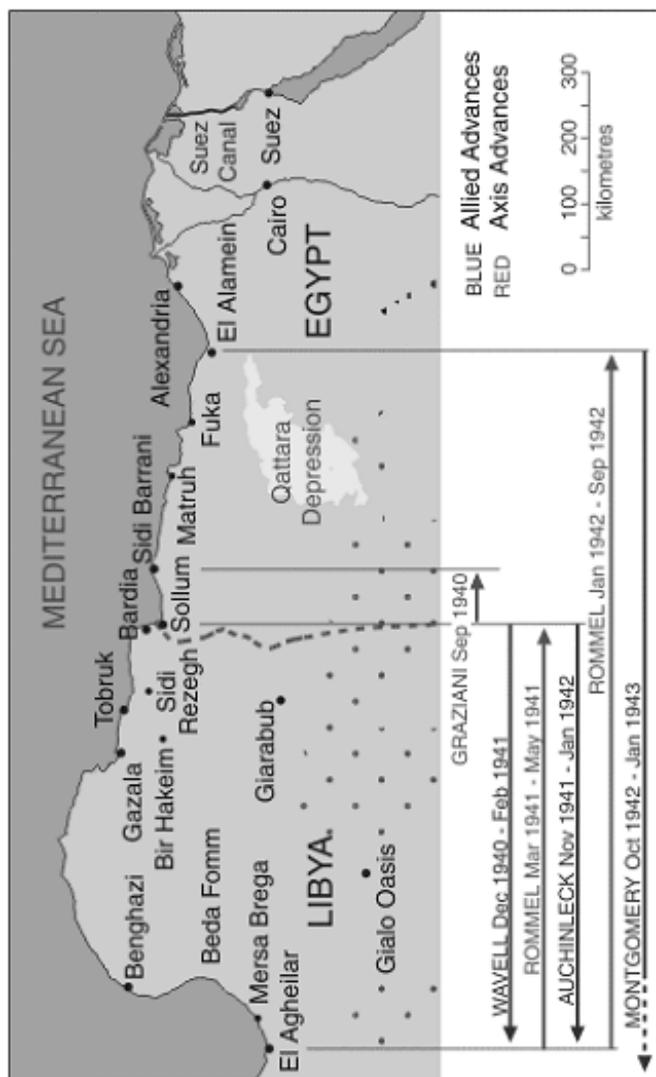
<sup>26</sup> AP3235, *op cit*, p 48.

<sup>27</sup> Terraine, *op cit*, p 312.

<sup>28</sup> Owen, (1948), p 30.

<sup>29</sup> Terraine, *op cit*, p 313.

**Figure 1: Overview of North African Campaign 1940-43**  
 (Taken from the Anzac Day Website)



reducing air's combat effectiveness. Thus, it emerged that 'modern war might take the form of a war for aerodromes' and since aerodromes are not in the sky, but on the land, what happened in the land battle bore direct effect upon the Air Force. Air-land co-operation had become a necessity.<sup>30</sup>

Operation COMPASS demonstrated the first satisfactory co-operative air-land enterprise of the War. A brilliantly orchestrated offensive by the British, COMPASS saw the Army advance 500 miles with only two divisions, routing an enemy army five times its size. The RAF established air superiority over the British, enabling the tanks and armour of Major-General O'Connor's tiny force to outflank the enemy without interruption by air attack.<sup>31</sup> The operation, said Wavell, 'could not have been executed without the magnificent support given by the Royal Air Force [...] it had been a triumph of inter-Service co-operation'<sup>32</sup>.

Early 1941 saw Churchill strip resources from North Africa to support the campaign in Greece. This, coupled with the arrival of the German *Afrika Korps*, under the formidable command of Rommel, meant that the British were on the 'back foot' for the first German offensive in March. With the British in full retreat once more, Tedder concluded that the RAF must do something to stop the enemy, and urged the use of fighters to strafe Axis transport columns.<sup>33</sup> This reversal of fortune brought with it a number of command changes within the British desert force. The first was the appointment of Air Marshal Sir Arthur Tedder as AOCinC of RAF Middle East. 'Co-operation [...] and flexibility were the keynotes of Tedder's air strategy' and the first man he called for, to command 204 Group in the Western Desert, was Air Vice-Marshal 'Mary' Coningham. Coningham, a WW II veteran, had a no-nonsense, common-sense approach to business.<sup>34</sup> Tedder's first instruction to him was to 'get together' with the Army.<sup>35</sup>

Undoubtedly, the proactive, 'non-stove piped' characters of both

<sup>30</sup> *Ibid.*

<sup>31</sup> Strawson, *op cit*, p 16.

<sup>32</sup> Terraine, *op cit*, p 316.

<sup>33</sup> *Ibid.*, p 336.

<sup>34</sup> Owen, *op cit*, p 60.

<sup>35</sup> Orange, (1990), pp 77-79.

Tedder and Coningham contributed massively to the development of air-land co-operation over the next few years in North Africa. Both men understood the need for integration and appreciated the synergy that could be achieved when the effects of land and air forces were amalgamated. Coningham especially, had a reputation for talent in co-operation, and the achievement of a workable air-land support system is generally (and fairly) credited to him.<sup>36</sup> Moreover, Tedder had a good relationship with the army GOCinC, General Sir Claude Auchinleck: 'he made an immediate partnership [...] and from that moment Army/RAF misunderstandings in the theatre were for practical purposes at an end.'<sup>37</sup> Even when Lieutenant-General Sir Bernard Montgomery later replaced Auchinleck, the cohesive trinity of air-land commanders remained intact. This is arguably the first air-land lesson gleaned from the North African Campaign: commanders must have a common understanding of each other, and what each component 'brings to the party'. Moreover, they must fully appreciate how to integrate the strengths of each component to offset the weaknesses of others. This understanding can only be achieved through joint training and establishment of robust joint doctrine.

During the summer of 1941, Operations BREVITY and BATTLEAXE would further test the air-land interface. Both offensives were designed to relieve the Allied-held Tobruk, but due to their shortness, they offered little scope for the practical development of integration techniques. However, there were lessons learned in retrospect:

'The main difficulty in providing air support was the almost complete lack of information from the Army. This was caused by the failure of the air-ground recognition system, brought about mainly by lack of response to aircraft signal by ground formations [...] failure of the wireless communications between forward troops and their headquarters had meant a serious lack of information at the headquarters regarding the dispositions of formations so that it was frequently impossible to give even a

<sup>36</sup> Hallion, *op cit*, p 152.

<sup>37</sup> Terraine, *op cit*, p 340.

conservative bomblines.’<sup>38</sup>

Additionally, another cogent reason for the break down of air-land co-operation was that the Army and RAF headquarters had been sited some 80 miles apart.<sup>39</sup> The lack of information flow between the two components was a direct result of remotely located headquarters and poor quality communications.

BREVITY and BATTLEAXE exposed many of the difficulties encountered when attempting to conduct dynamic air-support operations: combat identification (CID) of friend from foe; unreliable communications between engaged forces; lack of situational awareness at the headquarters level, leading to stifled decision-making; and the emotive subject of bomblines placement. These enduring problems are equally apparent in modern air-land warfare.

On arrival in North Africa in July 1941, Coningham noted that, ‘my headquarters was a small hole in the ground 5 miles away from the Army Commander. There was no combined headquarters.’ Therefore, with agreement from the Army, he initiated the establishment of a joint Army-Air headquarters when the 8<sup>th</sup> Army was formed two months later. This decision, wrote Coningham, ‘was of fundamental importance and had a direct bearing on the combined fighting of the two Services until the end of the war.’<sup>40</sup> Coningham knew that in order to harness true air-land jointery, his headquarters had to be joint.

Coningham’s initial efforts also focused on a joint air-land conference held in Cairo on 4 September to discuss the policy to be adopted in the Middle East for the provision of Air Support for the Army.<sup>41</sup> A memorandum issued by Churchill the next day regarding air-land integration backed up the efforts of this conference. Not only did his comments break the Army’s belief that only aircraft visible overhead were really helping, but they expressed the principle command relationship required to enable successful air-land co-operation:

<sup>38</sup> *Ibid.*, p 345.

<sup>39</sup> *Ibid.*

<sup>40</sup> Orange, *op cit* p 79.

<sup>41</sup> AP3235, *op cit*, p 55.

‘Nevermore must ground troops expect, as a matter of course, to be protected against the air by aircraft [...] the idea of keeping standing patrols of aircraft above moving columns should be abandoned [...] Upon announcing that a battle is in prospect, the AOC-in-C will give him [*the army commander*] all possible aid irrespective of other targets, however attractive. The Army [...] will specify [...] the targets and tasks which he requires to be performed [*and*] it will be for the AOC-in-C to use his maximum force on these objects in the manner most effective [...] the sole object being the success of the military operation.’<sup>42</sup>

These rulings, which bore resemblance to the *Schwerpunkt* concept, were widely published and vigorously enforced by both Tedder and Coningham, giving the RAF assistance in ‘sealing the deal’ on its propositions from the September conference; the results of which were embodied in the Air Support Directive of 30 September 1941. This significant directive detailed the conceptual principles that informed co-operation between the Desert Air Force and the 8<sup>th</sup> Army for the forthcoming CRUSADER offensive in November 1941 and more importantly, for the remainder of the war.<sup>43</sup>

The Directive detailed the concepts of indirect and direct air support, conveying the message that not all support to the Army would be conducted by aircraft located immediately overhead.<sup>44</sup> These two concepts continue to form the bedrock of contemporary Anti Surface Force Air Operations (ASFAO) doctrine as detailed in the current RAF Operations Manual.<sup>45</sup> The additional principles of the Directive began with the merging of headquarters and associated development of intimate working relationships amongst component commanders. Coningham had by this stage already co-located his headquarters with that of the 8<sup>th</sup> Army and Tedder had merged his with that of General Auchinleck. Tedder, demonstrating a taster of today’s joint approach, stated that, ‘In my opinion [...] the Middle East theatre is now so closely inter-related that effective co-ordination

<sup>42</sup> Terraine, *op cit*, p 347.

<sup>43</sup> Lewis, (2005), p 5.

<sup>44</sup> Middle East (Army and RAF) Directive on Direct Air Support, (1941), paras 2 & 3.

<sup>45</sup> Royal Air Force Operations, (2000), p 5.III.1.

will only be possible if the campaign is considered and controlled as a combined operation.<sup>46</sup> The Directive also called for the establishment of Air Support Controls (ASC) that could 'meet, modify or reject the requests for support' ensuring 'that the maximum effort is obtained from the available aircraft.'<sup>47</sup> Finally, guidance was given regards bomber attack profiles, target selection, allocation of effort, bomblines placement and air/ground communication and recognition signals.<sup>48</sup> Overall, the Directive provided a relevant doctrinal one-stop-shop for all air-land co-operation practitioners.

The formation of the ASCs arguably provided the solution to the majority of air-land problems in North Africa (similar in concept to the ASSUs proffered by the 'Wann-Woodhall Report'). A 'tentacle' concept was also adopted which established wireless communication between front line units and appropriate headquarters. In addition to the Tentacles, 'Forward Air Support Links' (FASLs) were developed for controlling air-support aircraft in the air, the equivalent of today's Forward Air Controllers (FAC). Tentacles and FASLs were assigned to infantry divisions to enable commanders in the field to call for air support when needed. ASC headquarters would pass accepted requests to the appropriate airfields, effectively scrambling aircraft, and then inform the relevant Tentacle of the strength and intended arrival time of the support on its way. Pilots could be passed target details before take-off, shepherded to the target area by a reconnaissance aircraft or, most often, a FASL would give them a 'target talk-on' once established in the overhead.<sup>49</sup> This flow of information, from request, to tasking, to talk-on, is identical to that used in modern air-support operations. Through meticulous training and constant refinement by exposure to combat, Coningham was able to drill this system into the North African forces. Moreover, by December 1941, Air Liaison Officers (ALOs) began to arrive in the Desert, specially trained to explain to both aviators and soldiers the intricacies of air support.<sup>50</sup> (Figure 2).

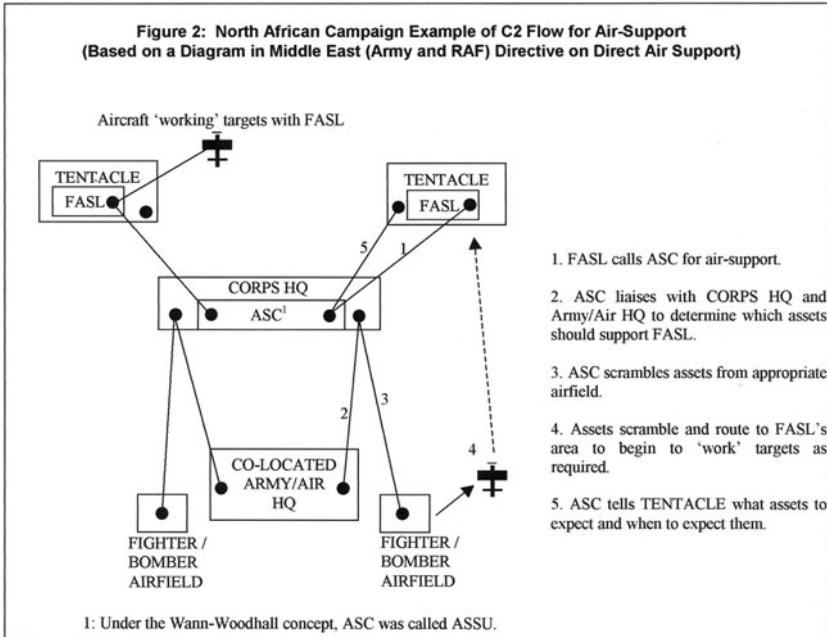
<sup>46</sup> Terraine, *op cit*, p 344.

<sup>47</sup> Middle East (Army and RAF) Directive on Direct Air Support (1941), *op cit*, paras 14 -72

<sup>48</sup> *Ibid.*

<sup>49</sup> Orange, *op cit*, p 82.

<sup>50</sup> *Ibid.*, pp 82-83.



The summer of 1941 saw both sides prepare for decisive encounter and by November, Operation CRUSADER provided Coningham with the ideal test ground for the improved air-support system. The objectives of the Operation were to destroy Rommel's forces, relieve Tobruk and open Tripolitania to invasion. Whilst on the ground CRUSADER was a disappointment, resulting in the eventual withdrawal to the Gazala Line, in the air the air-support system generally functioned well. The British established air superiority early on and heavy rains caused the enemy armour to bog down, providing perfect targets for the DAF. The introduction of new technology, in the form of the 'Hurribomber', and implementation of newly developed dive-bombing skills, allowed the DAF to harass German columns with 250lb bombs and cannon fire.<sup>51</sup> The introduction of the fighter-bomber (today known as swing-role) was, 'an important step in the development of what proved to be a formidable weapon for

<sup>51</sup> Hallion, *op cit*, p 156.

supporting the Army.<sup>52</sup> Moreover, the shift in dogmatic thinking, from a reluctance to perform dive-bombing to a recognised need for this art, was a welcome development. The fighter-bomber soon demonstrated that it could rival the famed *Stuka*, with parallel success and survivability.<sup>53</sup>

However, the air-support system had its share of difficulties during CRUSADER. For the greater part of the offensive, there was an average time lag of 2½ to 3 hours between initial call from the Tentacle to the employment of aircraft ordnance with the FASL. Clearly, this was hardly 'direct or close' support in the preferred meaning of the words.<sup>54</sup> The average distance from airfield to FASL was 200 miles, therefore increasing transit time, and on reaching the target area, many aircrew found it impossible to identify friendly forces from the enemy. Thus deprived of targets, pilots endured the further frustration of long waits for 'impromptu' support calls, as the Army itself battled with CID: a theme that was also apparent during Op TELIC in 2003.<sup>55</sup> There were unacceptable delays in the relay of messages from ASC to headquarters and unavoidable hold-ups caused by rendezvousing with fighter escorts on the way to the designated target area.<sup>56</sup> Target recognition, CID and fluidity of information flow stood out as the main areas that required attention post CRUSADER. For all its apparent 'paper symmetry', the air-support system still required much streamlining.<sup>57</sup> Nevertheless, 'none of this alters the fact that during CRUSADER the Army enjoyed the best air support it had ever had.'<sup>58</sup>

### **North Africa 1942-43**

The Battle of Gazala followed in May 1942 and continued through to July with the First Battle of El Alamein. From an air perspective, common themes were developing. The Army again fell into great confusion, with commanders uncertain of the location of their own

<sup>52</sup> Terraine, *op cit*, p 357.

<sup>53</sup> Hallion, *op cit*, pp 49-50.

<sup>54</sup> *Ibid*, pp 359-360.

<sup>55</sup> Minutes of Evidence (Brims), (2003), Question 681-692.

<sup>56</sup> AP3235, *op cit*, p 62.

<sup>57</sup> Terraine, *op cit*, p 359.

<sup>58</sup> *Ibid*, p 362.

forces, and intercommunication between units fragmentary. Additionally, crews found it impossible to identify the bomblines; conditions were extremely unfavourable for air-land support. However, at El Alamein, Rommel was forced into defence from which he was never able to escape; this signalled the turning point in the desert campaign. 'The Air Force participated fully in the fierce battles of early July, in which Rommel's army was at last decisively checked.'<sup>59</sup> The refined air-support system worked extremely well throughout the battle and got better and better. 'The speed with which the Air Force answered calls for support steadily increased, until the average time of delay between request [...] and aircraft [...] was [...] 35 minutes.'<sup>60</sup> As a result of a combination of doctrinal theory, experimentation, peacetime training in the UK, and operational experience in North Africa, an effective British air-support system had been developed by 1942, and essentially remained the same throughout the remainder of the war.<sup>61</sup> Moreover, its tenets still ring true in contemporary air-support doctrine.

By mid-1942, air-land co-operation had, as near as possible, been perfected, but it was the arrival of Montgomery that added the final, and arguably most crucial, element to the command relationship between the DAF and 8<sup>th</sup> Army. Montgomery had an innate understanding of the characteristics of air-land co-operation and he understood precisely the role of the DAF.<sup>62</sup> He handsomely acknowledged his reliance on the air arm by stating 'any officer who aspires to hold high command in war must understand [...] the use of air power'<sup>63</sup>. He amplified with, '...concentrated use of the air striking force is a battle winning factor [...] it follows that control of the available air power must be centralised, and command must be exercised through RAF channels...'<sup>64</sup>

He sited his headquarters with that of Coningham and encouraged continuous liaison between air and land. Tedder was later to comment that Montgomery put air co-operation as 'first in the order of

<sup>59</sup> *Ibid.*, pp 365-377.

<sup>60</sup> *Ibid.*

<sup>61</sup> Gooderson, *op cit*, p 26.

<sup>62</sup> Jordan, *op cit*, p 80.

<sup>63</sup> Bickers, (1991), p 125.

<sup>64</sup> *Ibid.*

priority.<sup>65</sup> Although later in the war relations with Montgomery diminished, due mostly to his over-inflated ego, at this point in North Africa he complemented Tedder and Coningham perfectly, demonstrating once again the need for *joint* commanders who appreciate the ‘business’ of the other Services.

The Battle of Alam el Halfa in the late summer of 1942 saw Rommel’s last attempt to break his defensive shackles, however this battle proved the climax of air-land co-operation and to all intents sealed the fate of Axis forces in North Africa.<sup>66</sup> It exemplified the use of air power on efficient and economical lines and was a proving ground for policies and theories for the handling of an air force.<sup>67</sup> Indirect air support began nine days before the enemy attack and then, in a perfectly co-ordinated and integrated effort, the guns and armour of the 8<sup>th</sup> Army made a ring around the enemy and air power gave the punch inside the ring. At the pinnacle of the operation, bombs were being dropped at an average of one every 40 seconds.<sup>68</sup> By 2 September, Rommel gave orders for retreat, largely because of British air superiority.<sup>69</sup> From the air perspective, the theory of indirect and direct support to the Army was proven. According to Montgomery, ‘the tremendous power of the air arm in co-operation with the land battle was well demonstrated.’<sup>70</sup> In short, the battle of Alam el Halfa fully vindicated the new air-support organisation and stands out as a landmark in the development of air-land co-operation.<sup>71</sup>

With Rommel in full retreat, guaranteed air superiority and a slick, battle-proven air-support organisation, the 8<sup>th</sup> Army continued on the offensive, pushing Rommel further west. The Second Battle of El Alamein and subsequent advance to the West witnessed full integration of air power and by February 1943 the 8<sup>th</sup> Army had entered Tunisia. At this point, Operation TORCH saw the determined entry of the USA into North Africa but unfortunately witnessed the

<sup>65</sup> Jordan, *op cit*, p 81.

<sup>66</sup> Terraine, *op cit*, p 381.

<sup>67</sup> RAF Narrative (First Draft), The Middle East Campaigns Volume IV, p 218.

<sup>68</sup> *Ibid*, p 191.

<sup>69</sup> AP3235, *op cit*, p 71.

<sup>70</sup> *Ibid*, p 72.

<sup>71</sup> *Ibid*.

heartbreaking relearning of lessons hard-won by the British in the previous two years. At Kasserine, a timid US ground commander kept his air assets close to his own troops, rather than freeing them to prosecute indirect support. The Axis forces exploited this and thus set the stage for the greatest disaster ever to befall US ground forces in battle, proving the disastrous results that can emerge from poor air-land co-operation.<sup>72</sup> After this, and with vast input from the British, the Americans redeveloped their air-support doctrine in line with that of the DAF, in the form of FM 100-20.<sup>73</sup> With all Allied forces now operating 'off the same hymn sheet', Rommel's forces were once more defeated at the Mareth Line and eventually, by 13 May 1943, the last remnants of Axis resistance in Africa had ended. Tedder's Order of the Day summarised the indispensable contribution of the DAF and other air formations to victory in the campaign by stating, 'by magnificent teamwork between commands, units, officers and men [...] you have shown the world the unity and strength of air power.'<sup>74</sup>

### **Air-Land Lessons Learnt from North Africa**

Whilst the lessons drawn from the North African Campaign are numerous, five main air-land co-operation lessons are of relevance to contemporary military campaigns. The first two are concerned with enabling air-land operations whilst the remainder are specific to the actual conduct of air support.

Firstly, and of overarching significance, control of the air must be achieved before successful air support can be provided. The British enjoyed almost total air superiority throughout the North African Campaign, which afforded the manoeuvring room to develop, perfect and ultimately provide air support to the 8<sup>th</sup> Army. Montgomery concluded that, 'if we lose the war in the air, we lose the war, and we lose it very quickly.'<sup>75</sup>

Secondly, command of air assets must be centralised and maintained within the specialist realms of the airman. Montgomery amplifies this point with his remark, 'the commander of an army in the field should have an Air Headquarter [*but*] air resources will be in

<sup>72</sup> Hallion (article), pp 245-246.

<sup>73</sup> Syrett, (1990), p 185.

<sup>74</sup> Bickers, *op cit*, p 134.

<sup>75</sup> RAF Operations Manual, *op cit*, p 5.II.1.

support of his army, not under his command.<sup>76</sup> He recognised that dedicating air assets solely to army support reduced their inherent flexibility hence, diminishing their overall combat effectiveness within the joint campaign. This recognition proved Montgomery's innate joint understanding of cross component capability. Even if the command of air remains within the domain of the airman, this does not absolve the soldier from understanding air power intimately.

Thirdly, and of prime importance to the effective conduct of air support, is the need for robust C2. Commanders at the operational level need to understand the capabilities of each component, and recognise how to harness these into synergistic air-land effect. Moreover, joint planning and decision making, achieved in North Africa by co-location of headquarters, must be sought in order to exponentially increase integration and co-operation. Additionally, fluid communications and C2 between the operational and tactical levels are essential. For air support to be successful, a system that connects operational decision-makers with tactical war-fighters must be in place to allow the right aircraft, to get to the right area, talk to the right person and prosecute the right target, all in as short a time as possible. No mean feat, and one that is continually grappled with in today's network-centric world of time-sensitive-targeting, and aspired to in the HQ Strike Command 2015 vision of 'precise campaign effects, at range, in time'.<sup>77</sup>

The fourth lesson is that maintaining situational awareness (SA) at both the operational and tactical level is extremely difficult in the 'fog and friction' of war.<sup>78</sup> Systems must be in place to afford operational commanders the ability to maintain SA of friendly forces, especially concerning location. Only with this SA can sensible decisions, such as bomblines placement, be made, thus, affording air the ability to conduct relevant indirect support operations. Furthermore, at the tactical level, robust recognition procedures are required to enable aviators to readily distinguish between friend and foe and therefore, bring air power to bear in a safe, timely and precise manner.

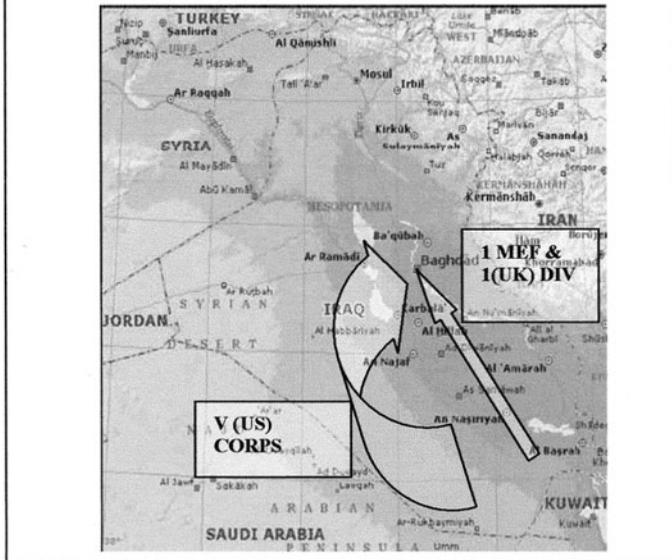
Lastly, but by no means least, the joint development, practice and

<sup>76</sup> *Ibid.*, p 125.

<sup>77</sup> CinC Strike Command's Monthly Bulletin, (2005), p 1.

<sup>78</sup> Howard, (1976), pp 75-89.

**Figure 3: Op TELIC Land Scheme of Manoeuvre  
(Based on a map in British Army Electronic Battle Box  
8<sup>th</sup> Edition, Disk 1, (2005))**



proving of theoretical doctrine through relevant and frequent training is essential if air-land integration is to be successful. Moreover, doctrine must evolve and develop with time and capability in order to prevent it from becoming irrelevant dogma.

## OPERATION TELIC COMPARISON

### Operational Overview

There were two geographical objectives for this campaign: Baghdad and the Rumailia Oilfields. The Coalition Force Land Component Commander's (CFLCC) plan was based on a two-pronged attack on Baghdad from Kuwait. V (US) Corps would attack on the left, approaching Baghdad from the South West. The 1st US Marine Expeditionary Force (1 MEF), a composite air-ground task force which included a dedicated Marine Air Wing (MAW) consisting of attack helicopters and fast-air, would approach Baghdad from the South and South East. The MEF included the 1st (UK) Armoured Division (1 Div): the UK's contribution to CFLCC's land scheme of

manoeuvre. The synergistic integration of air power into the land plan was fundamental for achievement of rapid, decisive success. Moreover, the speed and tempo associated with this campaign was of a different magnitude to that experienced during preceding contemporary operations. Using ‘shock and awe’<sup>79</sup> as its bedrock, this plan was designed to overwhelm the Iraqi regime. Therefore, joint decision-making and targeting had to be unrestrained.<sup>80</sup> Success depended upon deployment and integration of fast moving light forces, highly mobile armoured capabilities and *Close Air Support* (CAS).<sup>81</sup> Hence, a true understanding of air support and air-land co-operation was essential if the planned momentum for the operation was to be maintained. Unfortunately, the UK military entered TELIC with a less than adequate grasp of air support, especially concerning C2, and relearnt the key air-land integration lessons of their North African forebears identified in the case study above.

### **Control of the Air**

As in the North African Campaign, coalition forces in Op TELIC enjoyed a very high degree of control of the air, thus enabling air-support operations. However, unlike North Africa, where the Allies had to conduct air-to-air engagements to gain air superiority, coalition forces in Iraq achieved air supremacy without having to fight a single enemy aircraft: this was due to two main factors. First, the establishment of the Northern and Southern No-Fly Zones after the 1991 Gulf War banned the Iraqis from operating all aircraft in exclusion zones north of the 36<sup>th</sup> parallel and south of the 33<sup>rd</sup> parallel. To that end, the Coalition had control of the majority of Iraqi airspace even before TELIC began.<sup>82</sup> Secondly, the Iraqi Air Force was no match for that of the Coalition. Once combat operations began, no enemy aircraft got airborne. In fact, the Iraqis attempted to save as many of their air assets through ground dispersion, and even buried fighters at bases such as Al Taqqadum.<sup>83</sup>

However, with their airspace denied, the Iraqis had invested

<sup>79</sup> ‘Massive Firestorm Targets Iraqi Leadership’: CNN Website, (2003).

<sup>80</sup> Defence Committee Third Report of Session 2003-04, *op cit*, para 97.

<sup>81</sup> Operations in Iraq: First Reflections, *op cit*, p 19.

<sup>82</sup> ‘Containment: The Iraqi No-Fly Zones’, BBC News Website, (1998).

<sup>83</sup> ‘Iraqi Aircraft Buried in Desert’, BBC News Website, (2003).

heavily in establishing a robust Integrated Air Defence System (IADS). This consisted of multi-linked fibre optics that afforded secure communications and hybrid surface-to-air missile systems (SAMS) that did not solely rely upon radars for guidance, thereby rendering them invisible to coalition Suppression of Enemy Air Defence (SEAD) aircraft. A 'Super-MEZ' (missile engagement zone) of overlapping, complementary SAMS protected the heart of Iraq and was deemed a serious threat to allied aircraft. However, precursor shaping operations destroyed key installations, communications and IADS nodes, thus creating a favourable air situation above 20,000 feet from very early on in the Campaign. By 6 April 2003, coalition forces declared air supremacy over the whole of Iraq and considered the 'Super-MEZ' no longer a factor.<sup>84</sup>

Almost complete air dominance afforded commanders the luxury of concentrating air effort towards the support of the land component. In comparison with Gulf War I, the proportion of air sorties flown in support of land forces increased from 55% to 78%.<sup>85</sup> Owning the air allowed for unhindered implementation of air-land operations from *enemy air attack* however, freedom of action was not absolute during TELIC, and the threat to coalition aircraft operating at lower levels was considerable due to an inability to completely suppress enemy shoulder-launched SAMS and anti-aircraft-artillery (AAA). The DAF were also exposed to AAA, however, in the 1940s, both politicians and the public anticipated friendly losses in combat, therefore pilots were expected to press home attacks at low level despite the threat. This is the opposite to contemporary warfare where the downing of even one coalition pilot would have attracted disproportionate media attention and have great strategic effect upon public opinion towards the campaign. Hence, British aircraft in TELIC were politically shackled to operate at medium altitudes above the threat; however, at such heights, most targeting sensors did not perform optimally. Therefore, aircrew ability to achieve CID or find and positively identify targets was markedly reduced due to sensor technological limitations.<sup>86</sup> The vast proliferation of shoulder-launched SAMS throughout the world,

<sup>84</sup> Moseley, (2003), p 15.

<sup>85</sup> British Army Electronic Battle Box, *op cit*, para 309.

<sup>86</sup> Private informal discussions with members of No 3(Fighter) Squadron, (2003-04).

coupled with Western governments' aspiration to fight zero casualty wars, means that future air support will most probably be constrained to operate at medium altitudes. Thus, if British air support is to be more credible, RAF CAS aircraft need to be fitted with more technologically advanced equipment.

### **Centralised Control of Air Assets**

In Iraq, British land forces did not get priority for air support because they were not on the CFLCC's main effort. However, many British Army officers claimed the shortfall in air support for land forces had been because of a lack of organic, dedicated fast-air. The USMC MAW concept was hailed as the panacea to UK air support post TELIC, mainly because the MAW had provided dedicated air for the MEF throughout the operation. Many British Army officers claimed that the future of UK air support lay in the concept of dedicated Army fast-air.<sup>87</sup> However, the USMC operates in a fundamentally different way from the British Army. With no organic, indirect depth fire, such as UK forces have with artillery, the USMC relies solely on air power to provide depth effects hence, it has its own dedicated fast-air.<sup>88</sup>

The argument for using UK fast-air to support only UK land forces, or more drastically, permanent allocation of 'CAS only' assets to the British Army, has endured since TELIC.<sup>89</sup> This argument is fundamentally flawed and would prove an inefficient use of British air assets and detract from one of the key tenets of air power: agility.<sup>90</sup> Moreover, the UK's ACC for TELIC commented that, '...we would not have sufficient UK assets to provide cover to a UK land component 24 hrs a day. That is why air power has always been used and planned on centralised methodology. It is trying to make the best use of the resources across the battle space.'<sup>91</sup> This was the approach to implementation of air power during the North African Campaign, encapsulated by Montgomery when he said, 'the greatest asset of air power is its flexibility and this enables it to be switched quickly from

<sup>87</sup> British Army Electronic Battle Box, *op cit*, para 315.

<sup>88</sup> 1G/810/G, (2003), p A-1.

<sup>89</sup> Minutes of Evidence (Torry), *op cit*, Question 1316.

<sup>90</sup> FASOC, *op cit*, p 20.

<sup>91</sup> Defence Committee Third Report of Session 2003-04, *op cit*, para 103.

one objective to another. It follows that control of the available air power must be centralised and command must be exercised through RAF channels.<sup>92</sup> Undoubtedly, the argument regarding organic air support for the British Army will continue. However, TELIC proved Montgomery's guidance to be true, and centralising the RAF's air contribution for air support during the Operation worked well.<sup>93</sup>

### **Command and Control (C2)**

Lessons learnt from the North African campaign prove that successful air-land co-operation is reliant upon a robust C2 network that links together all necessary elements to ensure timely, effective and accurate support. During TELIC, air-land C2 was well catered for horizontally between components; however, vertically, at the Divisional level and below, it was sadly lacking.<sup>94</sup> A major lesson identified during combat operations in Afghanistan in 2001, was that in high manoeuvre, high tempo warfare, such as that planned for TELIC, the relationship between air and land is extremely important; therefore, all senior commanders understood and appreciated the need for air-land co-operation.<sup>95</sup> Hence, at the operational level, C2 was well catered for. Within the Joint Force Air Component Command Headquarters (JFACHQ) the Army was represented by the Battlefield Co-ordination Detachment (Air) (BCD(A)). Conversely, an Air Operations Co-Ordination Centre (Land) (AOCC(L)) acted as the Air representative within the Joint Forces Land Component Headquarters (JFLCHQ).<sup>96</sup> Both the AOCC(L) and BCD(A) provided coherent cross-component C2, and using real-time communications and networking, effectively emulated the collocated nature of the Army and RAF headquarters, demonstrated as essential during the North African Campaign.

However, TELIC outlined the woeful state of the UK's capability to provide vertical air-land C2, between the operational and tactical levels. This was arguably the UK's biggest weakness concerning air-land co-operation during the Operation and was described by Chief

<sup>92</sup> Bickers, *op cit*, p 125.

<sup>93</sup> Defence Committee Third Report of Session 2003-04, *op cit*, para 104.

<sup>94</sup> 1Gp.435/2.G, (2004), paras 1-2.

<sup>95</sup> Minutes of Evidence (Burridge), 2003, Question 399.

<sup>96</sup> 1Gp.435/2.G, *op cit*, para 15.

AOCC(L) as ‘not so much a capability gap as a gaping chasm.’<sup>97</sup> 1 Div deployed to TELIC expecting co-ordination of all air-land C2, from divisional level downwards, to be completed by a handful of Air Liaison Officers (ALO). In peacetime, the ALOs provide the essential link between the Army and the RAF but during operations, their meagre manpower and resources are completely inadequate to fulfil a demanding, high tempo, C2 role.<sup>98</sup> The US chain of command recognised this shortfall and, since 1 Div was operating within the MEF, allocated a United States Marine Corps (USMC) ANGLICO (Air, Naval, Gunfire Liaison Company), to act as an Air Support Element (ASE) to fill the capability gap, hence masking the problem. The ASE consisted of over 60 Marines plus their associated communications suite and provided a substantial reinforcement to the inadequate UK air-land C2 structure.<sup>99</sup> It was widely acknowledged that had UK land forces received air support in greater quantities during TELIC than they did, they would have lacked the capability to control it without the assistance provided by the USMC ASE.<sup>100</sup>

Fortunately, plugging the C2 gap with the USMC ASE allowed UK forces to adopt a robust and flexible air-support network that was implemented with relative success throughout the Operation. The procedures for requesting air support during TELIC effectively mirrored that utilised during the North African Campaign and the role of the USMC ASE in this procedure was pivotal, just as the role of its historical equivalent, the ASC, had been in North Africa. However, the lack of an end-to-end air-support C2 network was a fundamental oversight of UK forces during TELIC; this was undoubtedly the most apparent relearning of history during the Operation.

### **Situational Awareness (SA)**

TELIC proved that contemporary conflict is more chaotic, complex and dangerous than previously thought.<sup>101</sup> Attaining and maintaining SA at both the operational and tactical levels is as challenging in the modern age as it was during the 1940s. Even though 60 years have

<sup>97</sup> Pearce Interview (2006),.

<sup>98</sup> AOCC(L)/J5 Plans/Doctrine, (2004), p 1.

<sup>99</sup> Bell, (2003), pp 1-2.

<sup>100</sup> AOCC(L)/J5 Plans/Doctrine, *op cit*, pp 1-2.

<sup>101</sup> British Army Electronic Battle Box, *op cit*, para 302.

elapsed since the DAF grappled with CID in North Africa, technology has only partially solved this conundrum.

At the operational level, one of the high points of TELIC was the successful fielding of the Blue Force Tracker (BFT) system. BFT is a transmitter carried by friendly forces that sends their position, via satellite, to their headquarters. It not only affords commanders near real-time SA of campaign progress but also allows them to know where their forces are at all times, hence making the ‘fog and friction’ of battle more transparent.<sup>102</sup> However, BFT is employed at unit level only; individual soldiers do not carry a transmitter, due to its weight and size.<sup>103</sup> Therefore, the fidelity of information provided is not accurate enough to allow for CID of *individual* troops on the ground. Moreover, there is currently no technological solution to allow UK air-support pilots to determine friend from foe on the battlefield. During TELIC, many CAS pilots found it extremely difficult to distinguish friendly troops from enemy forces, especially when engaged in dynamic and confusing close combat.<sup>104</sup> Inherently, it is in this situation when air support and air power effect is most urgently required hence, increasing the likelihood of fratricide. Whilst recognition markings and panels are painted or attached to friendly equipment, they are of limited use to aircrew when operating in the preferred environments of medium altitude or night.<sup>105</sup> Therefore, at the tactical level, and most especially in the air-ground environment, CID remains as difficult today as it was for the DAF. Until affordable technology can provide a solution to this problem, it will be vital to develop joint understanding through training and doctrine to militate against the possibilities of blue-on-blue.<sup>106</sup>

### **Training and Doctrine**

Prior to TELIC, British air-support training and doctrine was anachronistic; it did not reflect advances in weapon and sensor technology and was steeped in Cold War methodology. Training was conducted on an ad hoc basis and air support for Army exercises was

<sup>102</sup> Isby, *op cit*, p 25.

<sup>103</sup> Minutes of Evidence (Brims), *op cit*, Question 683.

<sup>104</sup> Private informal discussions with members of No 3 (Fighter) Squadron, (2003-04).

<sup>105</sup> Bell, *op cit*, p 16.

<sup>106</sup> Operations in Iraq: First Reflections, *op cit*, p 25.

viewed as a beneficial add-on rather than an essential requirement. Apart from air support provided for development of new FACs, no dedicated front line air-land training was conducted in the UK. Hence, joint understanding in four main areas of the air-land interface, especially from the land perspective, was lacking prior to operations in Iraq.<sup>107</sup>

Firstly, the Air Tasking Order (ATO) process of air allocation to the joint campaign was deemed inflexible. This was due mostly to a poor understanding of the process rather than the process itself however, it has been widely recognised that ATO flexibility could be improved.<sup>108</sup> Secondly, the notion of air-land integration was misunderstood. On many occasions during TELIC, the synergistic effect of joint fires was not achieved because air and land effort had been deconflicted rather than integrated. Whilst some UK doctrine describes the concept of choreographed joint fire effect in the form of the Joint Air Attack Team (JAAT), UK forces very seldom practice it.<sup>109</sup> Therefore, throughout TELIC, it appeared that some land commanders would exhaust all organic fire options, such as artillery, before attempting to utilise air support.<sup>110</sup> Paradoxically, the JAAT concept is not detailed in current Joint Warfare Publications.<sup>111</sup> Thirdly, during TELIC, two new doctrinal concepts were introduced to British forces: Killbox Interdiction Close Air Support (KICAS) and Urban CAS. The UK had no detailed concepts for conducting either of these disciplines, whilst their US comrades appeared well practised, thereby demonstrating the lack of emphasis UK forces had placed on air-land integration before the Operation.<sup>112</sup> Lastly, under current British doctrine, the Fire Support and Co-ordination Line (FSCL) has replaced the 'bomblines' used during WW II to prevent fratricide. Simply put, airspace beyond the FSCL is the domain of the air commander whilst that short of it belongs to the land commander. However, during TELIC, the FSCL appeared to be an outdated air control measure that could not be utilised with ease in the high-tempo

<sup>107</sup> Pearce Interview, *op cit*.

<sup>108</sup> British Army Electronic Battle Box, *op cit*, para 314.

<sup>109</sup> RAF Operations Manual, *op cit*, p 5.III.3.

<sup>110</sup> Grant, (Jan 2003), p58.

<sup>111</sup> JWP3-30 or JWP 3-00.

<sup>112</sup> Bell, *op cit*, pp 12-18.

of modern warfare. US forces almost overran the FSCL because it could not be adjusted quickly enough, whilst at other times the line was placed too far ahead of friendly forces, imposing unnecessary and counterproductive constraints on air attack.<sup>113</sup> The contentious use of the FSCL is a pan air-support issue; however, US doctrine is soon to modify this concept for the modern digitised battlefield, introducing a system of killboxes that can be opened and closed as required, to allow for seamless integration of joint fires.<sup>114</sup> Whilst the WW II bomblines concept has been an appropriate measure until recently, it will soon become obsolete due to the changing face of contemporary warfare, and British forces must acknowledge this fact.

Overall, the paying of lip service to the development and understanding of relevant air-land doctrine and corresponding dearth of realistic joint training before TELIC, left UK forces poorly placed for air-land operations in Iraq. Whilst US forces discovered a new 'sweet spot'<sup>115</sup> in combat co-operation, the British completed TELIC stating, 'there is a lack of experience in requesting, co-ordinating and delivering CAS, the prevalence of which proves a need to conduct more CAS training.'<sup>116</sup>

### **Impact of Technology on Contemporary Air support**

Exponential advances in technology since WW II now allow air-land co-operation to be seamlessly rapid, precise and decisive.<sup>117</sup> Unfortunately however, British air-support assets are yet to benefit wholly from this fact. On the one hand, TELIC saw a significant change in the nature of the ordnance delivered by the RAF, with a shift towards precision-guided munitions (PGMs). Of all munitions employed, 85% were PGMs (compared to only 10% in Gulf War I) and 90% of these hit their intended targets.<sup>118</sup> Conversely, sensors and targeting equipment fitted to RAF aircraft are outdated and incapable of achieving CID when employed at medium altitudes against small tactical targets. Hence, during TELIC, many RAF aircrew wasted

<sup>113</sup> Pirnie *et al*, *op cit*, p xviii.

<sup>114</sup> *Ibid*, p 82.

<sup>115</sup> Grant, (Jul 2003), p 30.

<sup>116</sup> 'Air/Land Integration', (2004), p 1.

<sup>117</sup> Isby, *op cit*, p 25.

<sup>118</sup> Defence Committee Third Report of Session 2003-04, *op cit*, para 99.

valuable time attempting to find and then identify enemy targets from medium altitudes. This frustration, coupled with poor communications because of outdated and unreliable radio equipment, left British aircrew and FACs conducting air support at the same technological level as DAF pilots and FASLs in North Africa. Whilst technology is not the panacea, it can go a long way to expedite air support and alleviate the inherent danger involved with employing high explosives within hundreds of metres of friendly forces.

The RAF is slowly staggering into the world of data-linked CAS and enhanced resolution targeting pods, which has now become the norm for US forces. Until sensor and communication equipment is updated, the fundamentals of contemporary air support in the British forces will remain practically identical to that of the DAF and 8<sup>th</sup> Army: a soldier on the battlefield, trying to talk a pilot's eyes onto enemy targets, using poor radios, amidst the 'fog and friction' of combat. With no affordable technological solution inbound, only rigorous training and the development and understanding of joint doctrine will prevent CID from becoming the hurdle that prevents British air-land co-operation from advancing apace. This was demonstrated extremely well during the discrete counter-Scud operations conducted in Iraq's Western Desert during TELIC. Coalition Special Forces and air-support squadrons trained intensively together before the Operation, developing and refining a robust C2 network, a flexible airspace control system and specific 'Scud-hunting' doctrine, that allowed for fluid joint fires effect.<sup>119</sup> Over 100 'danger-close' CAS missions were successfully conducted with no instances of blue-on-blue.<sup>120</sup>

### **HISTORY RELEARNT?**

The comparative study above demonstrates that British forces relearnt historical air-land co-operation lessons during TELIC. With specific regard to the conduct of air support, the areas of C2, training and doctrine and tactical level SA were extremely lacking. Primarily,

<sup>119</sup> Green, (2005), pp12-17.

<sup>120</sup> Private informal discussions with members of No 3 (Fighter) Squadron, (2003-04). 'Danger-close' CAS is conducted when ordnance is employed within 1,000 metres of friendly forces.

the lack of a robust air-support C2 network was a fundamental omission. Had the US not provided support in the form of the USMC ASE, the British air-support network would have been, at best, rudimentary. Moreover, the lack of joint air-land training prior to combat, accompanied by outdated and misunderstood doctrine, left British forces poorly placed to conduct synergistic joint operations. Technology is often hailed as the fix-all solution to these issues, yet with current pressures on the British Defence Budget and a Government focus on health and education reform, it may be beyond the power of the MOD to supply cutting-edge technology in the near future. Hence, contemporary practitioners of air support will have to focus on the basics, such as those learned in North Africa and subsequently relearned in present-day Iraq, if air-land co-operation is to improve. Project Coningham-Keyes is attempting to bring these basics to the fore.

### **Project Coningham-Keyes and the Future**

The initiation of Project Coningham-Keyes (PC-K) in 2003, a tri-Service, 2-Star led joint venture, was an attempt to address the air-land lessons identified from TELIC. It consists of three separate working groups; Concepts and C2, led by Land; Battlespace and ISTAR (Intelligence, Surveillance, Target Acquisition and Reconnaissance), led by Fleet; and Training and Simulation led by Air.<sup>121</sup> PC-K has resulted in many positive steps forward towards a more robust and capable British air-support system.

The creation of a Joint Air Land Organisation (JALO) now acts as a central body to develop tri-Service air-land integration. The JALO is also attempting to bring together hitherto stove-piped equipment development programmes to produce interoperable technological solutions for future air support.<sup>122</sup> Additionally, extra Tactical Air Control Parties (TACPs) and FACs are being trained for the front line commands. Moreover, properly integrated, air-land exercises are being conducted, both in the UK and on overseas deployments such as in BATUS, Canada.<sup>123</sup> Finally, and most importantly, the development of an overarching Tactical Air Control System (TACS) will plug the

<sup>121</sup> 'Air/Land Integration', *op cit*, p 2.

<sup>122</sup> Pearce Interview, *op cit*.

<sup>123</sup> CinC Strike Command's Monthly Bulletin, *op cit*, p 1.

Air C2 gap. Unsurprisingly, the TACS closely resembles the Air C2 network developed and utilised during the North African Campaign (Figure 2). It includes the full range of C2 agencies involved in the air-support network, from soldier on the battlefield to joint headquarters. Moreover, the establishment of additional ALOs at Brigade and Divisional levels (BALOs and DALOs), to co-ordinate air-support requests into a bolstered BCD(A) and AOCC(L), allows for the development of a robust and efficient air-land C2 network<sup>124</sup> (Figure 4).

Although PC-K has gone a long way to plug the majority of air-land co-operation gaps, there is still one major area that requires development: CID. The Battlespace and ISTAR Working Group within PC-K is attempting to provide solutions for future tactical level CID, but these are heavily reliant on technology and at present are costly. The need for upgraded targeting pods and data link CID solutions is acknowledged but this is subject to the priorities placed upon the Defence Equipment Programme.<sup>125</sup> However, optimistically, MOD's policy for equipment procurement remains focused on this area and 'alongside precision strategic attack...air-land co-operation are [*sic*] the biggest focus for future equipment capability.'<sup>126</sup>

Fortunately, the continuous tempo of current operations in both Iraq and Afghanistan maintains the focus on air-land co-operation. British forces have witnessed a quantum leap forward in jointery and a realisation of the importance of the air-land interface, especially for urban and counter-insurgency operations.<sup>127</sup> A British officer recently serving in Afghanistan had this advice to offer his comrades: 'anyone deploying [to Afghanistan] down to the rank of Platoon Sergeant, must do [...] TACP practice. The one thing that can get to you in time in Afghanistan is air.'<sup>128</sup>

If the British Army of the future is to fight successfully as lighter and faster forces, in a large, distributed battlespace, it must understand the basics of air support. Conversely, tomorrow's RAF must become

<sup>124</sup> 1Gp.435/2.G, (March 2004), pp 1-8.

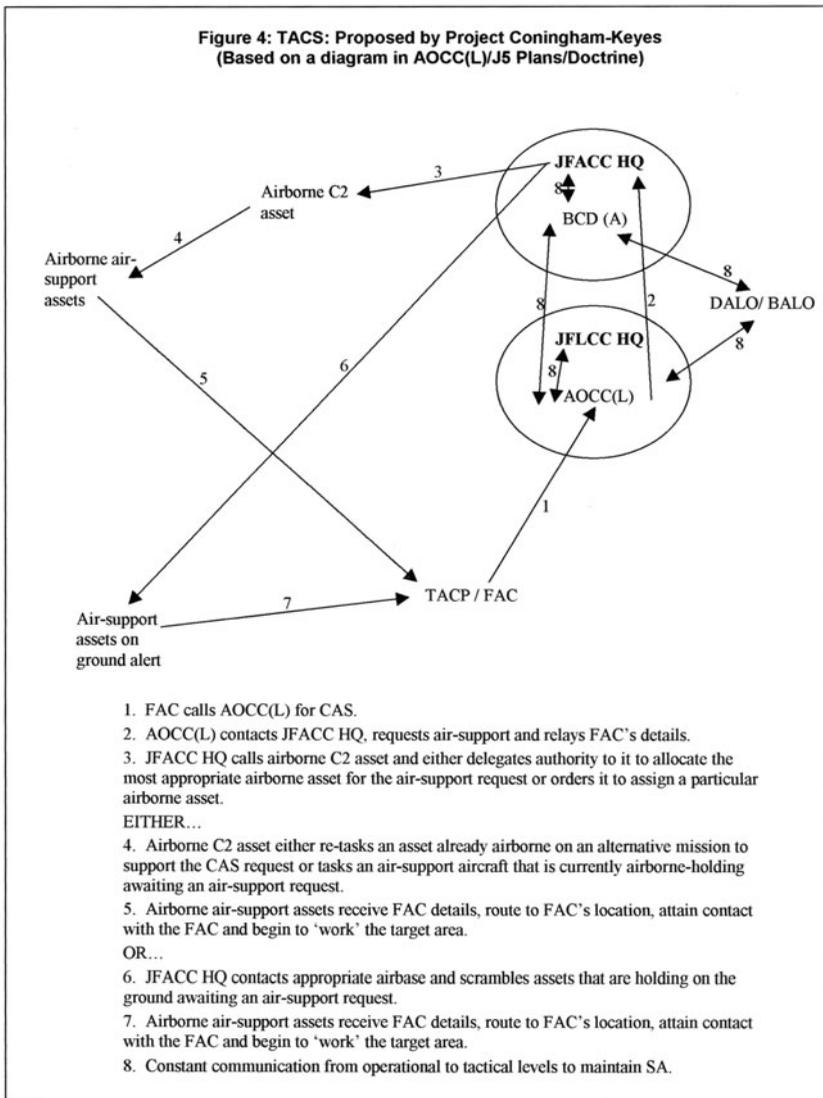
<sup>125</sup> Defence Committee First Special Report of Session 2003-04, *op cit*, para 31.

<sup>126</sup> Hay, (2006), MOD Presentation.

<sup>127</sup> Walters, (2006), p 7.

<sup>128</sup> LAND/Fd Army/3189/2, (2004), para 3d.

**Figure 4: TACS: Proposed by Project Coningham-Keyes  
(Based on a diagram in AOCC(L)/J5 Plans/Doctrine)**



more adept at Integrated Air Operations.<sup>129</sup> Only then will the lessons identified from TELIC become lessons learnt. However, this will not be easy. As inter-component tensions endure, especially in the domain of defence spending, air-land interaction will remain difficult. Co-operation is ‘a slow-growing and delicate plant, requiring time, much goodwill, regular human contact and careful training. It is a mood, not to be conjured into existence by decree at a moment’s notice.’<sup>130</sup> Unfortunately, historical lessons were relearnt in Iraq in 2003. Only a joint approach towards air-land co-operation will prevent British forces from relearning the lessons identified during TELIC in the next major conflict.

## GLOSSARY

1 Div	1st (UK) Armoured Division.
AAA	Anti-Aircraft-Artillery.
ACC	Air Component Commander.
Air support	Generic term for Anti-Surface Force Air Operations (ASFAO).
ALO	Air Liaison Officer. Normally an air force officer permanently assigned to a land unit (either at Division or Brigade level) to act as the link between air and land.
ANGLICO	Air Naval Gunfire Liaison Company. A USMC concept consisting of personnel specially trained in the art of bringing joint fires to bear.
AOCinC	Air Officer Commanding in Chief.
AOCC (L)	Air Operation Co-ordination Centre (Land). An organisation consisting of approximately 20 personnel that represents the JFACC within the JFLCC Headquarters. Co-ordinates and directs air support to Land forces in order to integrate air operations with the supported Land formation.
ASFAO	Anti-Surface Force Air Operations. Defined as a core capability of air power: either direct or indirect air operations that may be employed in the air-land environment.
ASC	Air Support Control. A concept developed in the North African Campaign and detailed in the Middle East (Army &

<sup>129</sup> FASOC, *op cit*, p 8

<sup>130</sup> Orange, (1990), p 79.

	RAF) Directive on Direct Air Support, to facilitate C2 of assets for air support.
ASE	Air Support Element. A concept utilised by the USMC describing a team ascribed for integrating air support with a land unit. Normally consists of an ANGLICO. This concept is shortly to be adopted by UK forces whereby members of the AOCC(L) will form an ASE and attach to a designated land unit as required.
ASSU	Air Support Signals Unit. The forerunner of the ASC concept developed in the 1940s during the Wann-Woodhall air-land co-operation experiments.
ATO	Air Tasking Order. A set of orders disseminated to air power force elements detailing mission and assigned targets etc.
BALO	Brigade Air Liaison Officer.
BATUS	British Army Training Unit Suffield, Canada
BCD(A)	Battlefield Co-ordination Detachment (Air). An organisation that represents the JFLCC within the JFACC Headquarters. It fills two broad functions: passage of LCC's intent and concept of operations and passage of tactical detail to allow co-ordination of air-land operations.
BFT	Blue Force Tracker. A system that transmits location information.
Blue-on-blue	Fratricide. Friendly forces mistakenly attacking other friendly forces.
Bombline	An air-land deconfliction method used during WW II. A line, where possible based on a physical feature easily identifiable to both airmen and soldiers, projected forward of friendly troops, beyond which aircraft were permitted to engage targets, therefore providing for deconfliction between ordnance employed by air and friendly land forces. Similar in concept to the modern day FSCL.
C2	Command and Control.
CAS	Close Air Support. Defined as air action against hostile targets that are in close proximity to friendly forces, and requires detailed integration of each mission with the fire and movement of those forces.
CID	Combat Identification. The ability to determine the identity of friendly and enemy elements in the battlespace.
CFACC	Coalition Forces Air Component Commander.
CFLCC	Coalition Forces Land Component Commander.
DAF	Desert Air Force. The Air Force used in the North African

	Campaign of WW II.
DALO	Divisional Air Liaison Officer.
Danger close CAS	CAS which involves ordnance being employed within 1,000 metres of friendly forces.
Direct Air Operations	Direct air operations are those intended to directly affect the outcome of a contact engagement between friendly and opposing forces.
FAC	Forward Air Controller. The FAC's principle function is the control and prosecution of CAS. The FAC can be either on the ground or airborne. During TELIC, only British ground FACs were used.
FASL	Forward Air Support Link. The FAC equivalent used during the North African campaign.
FM 100-20	A US field manual published in 1943 describing the command and employment of air power with particular reference to air-land integration.
Fratricide	Blue-on-blue. Friendly forces mistakenly attacking other friendly forces.
FSCl	Fire Support and Co-ordination Line. A line established by the LCC to denote co-ordination requirements for fire by other force elements, which may affect his current operations. The FSCl applies to the fire of air, land or sea weapon systems. A modern equivalent to the bomblines of WW II.
IADS	Integrated Air defence System.
Indirect Air Operations	Indirect air operations are those intended to disrupt and destroy an opponent's military assets and infrastructure in the rear area.
ISTAR	Intelligence, Surveillance, Target Acquisition and Reconnaissance.
JAAT	Joint Air Attack Team. UK doctrinal description of the concept of choreographed joint fires.
JALO	Joint Air Land Organisation. Acts as a central body to develop tri-Service air-land integration.
Joint Fires	The choreography of employing different fire effects, from air, land or sea systems, onto a target.
KICAS	Killbox Interdiction Close Air Support. A system of grids which can be opened or closed for CAS. If open, air can prosecute targets within a killbox safe in the knowledge that there are no friendly forces within the same killbox. If closed, air must co-ordinate with the local land commander

	to deconflict from friendly land forces before engaging enemy targets.
Killbox	A coded grid, normally 30 minutes of longitude by 30 minutes of latitude, used as an airspace control measure.
LCC	Land Component Commander.
MAW	Marine Air Wing.
MEF	Marine Expeditionary Force.
Montgomery	General Bernard Montgomery.
North African Campaign	The WW II campaign fought in the deserts of North Africa between 1940 and 1943.
OIF	Operation IRAQI FREEDOM. The US name given to the 2003 campaign to liberate Iraq.
OODA Loop	Observe, Orientate, Decide, Action Loop. A decision-action cycle devised by Colonel John Boyd, describing methodology to employ to force the enemy to become reactive to the initiative of friendly forces.
PC-K	Project Coningham-Keyes. A project initiated after Op TELIC to investigate and implement methods of improving British air-land co-operation.
SA	Situational Awareness.
SAM	Surface to Air Missile.
<i>Schwerpunkt</i>	The German WW II concept of synergistically blending firepower on the battlefield. Equivalent to Joint Fires in contemporary parlance.
Scud	A long range, tactical, surface to surface ballistic missile system.
Super-MEZ	The Missile Engagement Zone that protected the heartland of Iraq during Op TELIC.
TACP	Tactical Air Control Party. A team of four personnel which generally includes two FACs and two signallers. The TACP is the 'point of the spear' in the prosecution of CAS.
TACS	Tactical Air Control System. The overall air C2 structure that supports UK operations at the tactical level.
TELIC	Operation TELIC. The British name for the campaign to liberate Iraq in 2003.
USMC	United States Marine Corps.
Wann-Woodhall Report	A report describing the results of, and recommendations arising from, air-land co-operation experiments conducted in 1940.

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## A LETTER FROM 'BOMBER' HARRIS

*Between undetermined post-war dates, but probably in the 1960s, Gp Capt Hamish Mahaddie DSO DFC AFC\* undertook a lecture tour of Australia and New Zealand. Before departing, he wrote to Sir Arthur Harris seeking a few sentences of introduction for his speeches. Because it is written in his own words, Sir Arthur's response may be of some interest and a transcript is reproduced below along with a facsimile of his signature as it appeared on the original. There is clearly a degree of hyperbole involved and the Editor cannot vouch for the accuracy of any of the statements made; nor is it intended that this should stimulate any correspondence. It is simply offered as an interesting historical curiosity. Sir Arthur wrote:*



Persuading Hamish Mahaddie to revert to his wartime Pathfinder role on my behalf during his present itinerary, I welcome this opportunity to send my greetings and very warmest regards to all Bomber Command Old Lags, Aborigines, Maoris, and Whatevers or Whatareyou's. Not forgetting that 40% of Bomber Aircrew and 49% of Bomber Pilots came to our aid from the Dominions and Colonies mainly as volunteers. I would assure them all, if they still need any such assurance, that their wartime efforts were the major

cause of the enemy's defeat in the Air, on Land, and at Sea. If you want incontrovertible proof of that statement you can now read it repeated over and over again in the statements of Adolf Hitler, Goebbels and Albert Speer in the *Goebbels Diaries* and Albert Speer's two books: Not to mention Monty taking the opportunity of vast public banquets in London and Cape Town publicly to assert that 'the Bomber did more than anyone to win the war'. Rommel, Germany's best General, informed his superiors, once our invasion had got well established ashore in France 'Stop the bombers or we can't win. All

we can gain by going on is the loss of another city every night. If we have the Atom Bomb, drop it, or make peace', but they couldn't stop the bombing and they hadn't got the Atom Bomb because Hitler turned down the idea of producing one saying that it was all 'Jew Science', and you know what happened to Rommel for speaking the truth!

General Sepp Dietrich commanding the armoured spearhead of the Ardennes breakthrough on which the success of that whole final enemy offensive had depended, held up at Bastogne, as so-called 'history' relates, by an American General who, when called upon to surrender, replied with a mild four letter word which it seems so shocked those tough and so nearly victorious soldiery, that they gave up, burst into tears, and went back home to complain to Mother about that 'rude man' – or so 'history' infers!

However, when Hitler's urgent messenger Albert Speer reached Sepp Dietrich's Headquarters and said 'the Fuhrer's orders are that you must not stop; you must go on at all costs', Sepp Dietrich replied, 'Go on! How can we go on? We have no ammunition left and all our supply lines have been cut by air attack'.

In the atrocious weather during those critical few days and nights only the night Bombers of Bomber Command were in continuous action, or at times *at all*. Tedder refers to that work of the Bombers in his book as 'beyond praise'. Eisenhower said, in writing, 'Godammit they *have* achieved the impossible' and Sepp Dietrich confirmed it to Albert Speer that night 'as they listened to the continuous roar of heavy four-engined bombers overhead in the dark and mist' by saying, 'people don't realise that not even the best troops can stand up to this heavy bombing! After an experience of it they lose all fighting spirit'. (The Medicos call that shell-shock). The General who surrendered Boulogne with 8,000 fit men also confirmed that, by writing in his Diary which was captured with him, 'Can anyone survive when a carpet of bombs has fallen. One is driven to despair when at the mercy of the RAF without defence. All our fighting seems hopeless, all our casualties in vain'. Eisenhower also described Bomber Command as 'one of the most effective parts of his whole organisation, always seeking new ways of using their types of aircraft to help the Armies forward'.

As for Goebbels, he and Albert Speer repeatedly assert in their

writings that the strategic bombing was 'the cause of all our set backs' and Speer further asserts in writing that all the allied war books he has read miss that obvious fact and conclusion. He refers to the Strategic Bombing as, for Germany, 'The greatest lost Battle of all'.

The bombing destroyed and/or contracepted hundreds more submarines and small war craft and more capital ships than the Navy. It also annihilated the enemy merchant fleet on which their heavy war industries depended for the import of essential Scandinavian ores. In the air, bombing prevented the Germans from ever building up a worthwhile bombing force and made them concentrate almost entirely on the production of fighters and the training of day and night fighter pilots in a despairing effort, which failed, to protect the Fatherland.

The Anti-Aircraft defence of Germany, which failed to deter you Old Lags, deprived the German armies on all fronts of 20,000, ie half, of their vitally needed Anti-tank – Anti-Aircraft guns and the 900,000 fit men needed to man those guns in Germany, men who would otherwise have manned those essential Anti-tank weapons on every enemy front, a major cause of the German armies' defeat on every front. Railway repairs to bomb damage kept another 80,000 fit skilled men fully employed in Germany and thousands more for repairs to bomb damage to essential war industries. All of those men, but for the bomber offensive, would have been additional highly skilled soldiers in the German armies in the field.

Speer also states that it was the very heavy RAF bombs that did the 'irreparable damage' to industrial plants and he has also expressed his astonishment at the extraordinary and ever increasing accuracy of the RAF bombers on such small targets such as benzole plants, sometimes bombed blind through thousands of feet of cloud, during the final stages of the war.

Our Official History describes the result of the Bombing of Berlin as 'not a failure, but a defeat'. But before any Allied soldier got within 50 miles of Berlin the Central Government of Germany had been virtually reduced by that bombing to two maniacs – Hitler and Goebbels, cowering deep underground beneath the widespread ruin of the Capital City, issuing voluminous orders to practically phantom Armies which either no longer existed or were in such position and condition as to make obedience to such orders impossible.

Meanwhile those two maniacs were testing poison pills on a dog,

to see if they would suit their purpose, which they shortly carried out, of murdering their own wives and children and committing suicide!

If London and the top Government of England had been reduced by German bombing to similar conditions and, say, Winston Churchill and Brendan Bracken to the same position, state and intentions (which is of course inconceivable), I wonder if any German Official History would describe that bombing as 'not a failure, but a defeat'!

I leave that to your Judgement; and to the verdict of real History.

Take my tip, and get those Goebbels and Speers books and, when your grandchildren ask you what you did in the Great War, tell them to read them and they'll get the true facts.

My warmest regards to you all,

Arthur T. Harris  
MRAF

## TIGER FORCE AND FLIGHT REFUELLING

**Brian Gardner**

In late 1937, following several years of flight refuelling experiments carried out independently by the Royal Aircraft Establishment (RAE) at Farnborough,<sup>1</sup> and Sir Alan Cobham's Flight Refuelling Limited (FRL), the Air Ministry asked FRL to assume responsibility for all further development for both civil and military applications. By 1939 sufficient progress had been made to permit Imperial Airways to launch an experimental transatlantic air mail service using Empire Class flying boats refuelled by Harrow tankers.<sup>2</sup> After a delayed start, the service was short-lived, as it was terminated, as planned, in September with the onset of the Canadian winter (ice in Botwood harbour). Plans to reinstate the service during the 1940 season were frustrated by the spread of conflict, the loss of two of the modified flying boats and damage to the UK-based tanker inflicted by enemy action.

Meanwhile, since flight refuelling appeared to have considerable potential in a military context, in February 1939 FRL had been asked to carry out a case study specifically related to the forthcoming Stirling. As was to be expected, this indicated that, by taking off with a reduced fuel load and refuelling in flight, take off performance would be improved, safety would be enhanced, and bomb load and range would be increased.<sup>3</sup>

Cobham made several other proposals to employ flight refuelling, but these were not considered to be practical propositions, especially at night, which had, by mid-1940, become standard practice for heavy bombers. As DOR at the time, Gp Capt R B Mansell, noted: 'By using it we would no doubt carry a few more bombs per sortie where the bomb load has had to be restricted to obtain a reasonable take-off run, but in my view the complications and effort involved would be out of all proportion to the increase in bomb load obtained.'<sup>4</sup>

Writing after the war, Air Mshl Sir Robert Saundby summed up the pre-war Air Staff's views on the employment of flight refuelling as follows:<sup>5</sup>

'The Air Staff more than once made a study of the advantages and disadvantages of adopting this system. It was

clear that it would be quite feasible, in favourable circumstances, to refuel one or two individual bombers or fighters from a tanker, and this would enable them to undertake special missions. But we were at that time visualising air operations involving massed attacks by hundreds and even thousands of bombers, and a defensive organisation employing many squadrons of fighters in the air at the same time.

In such conditions, even if the provision of a large number of tankers were accepted, it would have been quite impracticable to have made any general or even considerable use of the existing system of refuelling in flight.'

### **The Origins of the VLR Force.**

By 1942 the Allies had agreed that their combined strategy should be to defeat Germany first and then to concentrate on Japan, redeploying bombers to the Far East when they were no longer required in the European Theatre. To that end, during the latter part of 1943, the Air Ministry's Directorate of Bomber Operations drew up tentative plans for the bombing of Japan. This involved the creation of a Very Long Range (VLR) bombing force which would become the British contribution to an American-led campaign.

Early drafts, based on an aircraft capable of carrying a 'suitable' bomb load over a radius of 1,500 miles, considered operating from airfields in Burma, China, Formosa, the Philippines and the Marianas. At that time, of course, few of these basing options were actually available and the RAF had no bombers with the required performance in any case. With a view to extending the range of the Lancaster, therefore, consideration was given to employing flight refuelling, and/or to developing the larger Lancaster Mk IV and V – subsequently to become the Lincoln Mk I and II respectively.

In January 1944, an Air Ministry paper examined the use of refuelling in the air for the long-range bombing of Japan.<sup>6</sup> It concluded that it was the only practical means of obtaining the desired range, and recommended that an experimental unit should be set up to develop equipment and techniques and to devise training methods. ACAS(P) responded that, if the projected performance could actually be achieved, priority should be given to developing this technique for large-scale use.

The flight refuelling of Lancasters was discussed at a conference held on 16 February, with representatives of Avro and FRL present, when it was agreed that some forty squadrons would be required for the VLR force, half of them bombers and half tankers.

In his memoirs<sup>7</sup>, Sir Alan Cobham recalls that:

‘ . . . I was told of a plan to bomb the Japanese mainland from Burma using Lincoln bombers that would be refuelled by Lancaster tankers. Six hundred of each were to be converted and ready by the end of the year, for use in early 1945. The two representatives from Avro said that it couldn’t be done in the time. But I got to work, and soon found that I wasn’t “bloody Cobham” any more, but the top priority man of the moment. Malvern and Staverton would not be enough, so we were given facilities at St Athan aerodrome in South Wales; I dragged Hugh Johnson back from America and put him in charge there. We designed the necessary equipment and placed huge contracts for sheet metal, castings, tubes, hoses, chains, everything else. We started to train RAF mechanics: we found a dispersal aerodrome for our finished aircraft and established a training school for aircrew at Staverton; we managed to secure large quantities of the 1880 Greener gun<sup>8</sup> And at every point we found the red carpet spread smoothly before us – even the bank had been told to make no difficulties.’

Approval for development work on Lancaster air refuelling was given on 18 February, with the stipulation that conversion from bomber to tanker or vice versa should be a comparatively simple job within unit capacity.<sup>9</sup> Five days later the Directorate of Technical Development (DTD) was asked to proceed with development of equipment for Lancasters Mk I, III and IV, and to produce an initial fifty sets of fixed fittings, and twenty-five sets each of tanker and receiver equipment.<sup>10</sup>

Three modified aircraft were to be delivered to FRL at Staverton as soon as possible with two more in mid-September and six for the Bomber Development Unit (BDU). Another fifty would be required to permit squadron training to begin in the first half of October. The original estimate of 1,000 production sets plus 50 for training was expected to be sufficient for the initial equipment of the forty

projected squadrons, allowing for one or two month's operational 'wastage'. Apart from the first eleven aircraft to be used in development trials, remaining aircraft were to be new production machines. The Lancaster IV would be fitted with fixed fittings on the production line, and it was anticipated that they would begin to reach the squadrons from the end of December 1944.

Meanwhile the staffs had been considering the operational constraints. It had been agreed that missions would be planned to permit refuelling in flight to be carried out beyond the range of enemy fighters and in daylight, with the bombers then attacking unescorted and in darkness. Some thought was given to planning for an additional refuelling on the homeward leg of a sortie, but it was concluded that this was not acceptable under normal circumstances due to the possibility of a missed RV. Nevertheless, it was recognised there could be occasions when it might be essential to refuel more than once, and this option was to be explored in operational trials.<sup>11</sup> In this context, the development of a dedicated radar aid for homing and rendezvous had also been recommended, as the chances of achieving a tanker/bomber rendezvous by dead reckoning were considered to be 'extremely small'.<sup>12</sup>

Progress was reviewed at a meeting held on 25 May to discuss future production, aircraft modification and delivery plans. It was noted that:<sup>13</sup>

'The more the Pacific Campaign is studied, the more evident it becomes from the great distances involved that the process of 'softening up' Japan by long-range strategic bombing is an essential part of the campaign, and may be a protracted affair. It is our policy to take a share in this part of the war and it is important that we should plan to build up our target force of 40 squadrons as early as possible.'

### **Bomber Command Views.**

On 21 August, AOCinC Bomber Command was advised of the current position regarding the projected Far East bomber force:<sup>14</sup>

'As a matter of policy, the British Chiefs of Staff have agreed that it is desirable that a substantial British Heavy Bomber Force should be deployed to take part with the

Americans in attacks against targets in Japan.

Unless Russia enters the war against Japan, no bases will be available from which bomber operations could be conducted against Japan with standard British heavy bomber aircraft. In order that the range of the Lancaster aircraft can be extended to the maximum, development is proceeding in the technique of refuelling the Lancaster bomber in the air from another Lancaster equipped as a tanker. By this means it is estimated that the radius of action of the standard Lancaster can be increased by about 45%. This would allow operation from bases in Formosa or in the China coastal area, opposite or North of Formosa.

The intention is that after the defeat of Germany, a force of up to 40 Lancaster squadrons from the UK should be moved to the Far East theatre as soon as bases become available. Twenty of these squadrons would be equipped as bombers and 20 as tankers.

If however, bases become available within the normal range of Lancaster aircraft, or should attack be required against targets other than Japan, the entire 40 squadrons would be available as standard heavy bombers by removal of equipment from the tanker aircraft.

To enable experience to be gained and for development purposes, three bomber and three tanker aircraft with full equipment are being allotted in the near future to BDU.'

Bomber Command was not enthusiastic about the idea, and did not consider flight refuelling on active operations to be a practical proposition. The Command's reluctance to adopt flight refuelling was apparent in official correspondence, memos and minutes, as it was thought increased range could best be achieved by increasing fuel capacity, and employing long range cruise techniques to reduce fuel consumption.

The use of Halifaxes instead of Lancasters was suggested, but this was rejected as it had already been established that the Lancaster/Lancaster combination would be the most efficient and economical, and, in any case 'Any change now would set the programme back many months.'<sup>15</sup>



*Lancaster tanker during the BDU trials in 1945. Flight photo 18878s.*

### **Development and Modification.**

Apart from the two prototypes, FRL had been awarded a contract for forty-eight sets of equipment, the main production order having been placed with Avro, who were to install the fixed fittings and new doors under the bomb bay tanks, while production of most of the removable equipment was sub-contracted back to FRL. Preparatory engineering work was to be carried out, mainly by Service labour, at St Athan, where it had initially been expected that aircraft would start arriving from 1 January 1945. This programme soon began to slip, however, and by mid-August 1944, it had been decided that only the first eleven machines (those earmarked for the trials programmes) would be modified prior to the end of the German war, which was forecast to occur on an unspecified date referred to as 'X-day'.

By September, all refuelling equipment (which was much the same as that used in the pre-war Imperial Airways service, but with hydraulic power replacing manual operation) had been ground tested, and the first pair of Lancasters modified as tanker and receiver were expected to fly shortly.<sup>16</sup>

The tanker fit involved two 600-gallon fuel tanks in the bomb bay, together with a hose drum, a line winch and a compartment for the refuelling operator. Bomb doors were removed and replaced by hinged fairings covering the tanks. The receiver had a faired reception coupling in the tail, and an operator's station with an hydraulic control



*Lancaster tanker seen from the receiver; the small drogue is to prevent the hose from whipping. Flight photo 18876s.*

panel in the rear fuselage. An hydraulically-operated winch let out a hauling line from the reception coupling; at its free end there was a sinker weight and a spring-locking grapnel.

In operation, the two aircraft flew more or less side by side with the receiver trailing its weighted hauling line. The tanker fired a projectile in order to intercept the hauling line; the two lines were snagged by the grapnels and hauled into the tanker, where the operator removed the sinker and connected the hauling line to the hose nozzle. The hose was then hauled across to the receiver where it entered the reception coupling and was locked by hydraulically-operated toggles. With the connection complete, fuel flowed under gravity out of the tanker along the hose to the reception coupling and from there it was fed into the receiver's inboard tanks. To reduce the fire risk, the hose was flushed with nitrogen before and after fuel was passed. On completion of refuelling, the coupling was flushed with methyl bromide as the nozzle was released; the hose was let out, and the two aircraft flew apart, causing a weak link in the hauling line to separate.

The prototypes of the modified Lancasters (tanker PB972 and receiver ND648) had both flown by early November, fuel being passed between them for the first time in December. Other aircraft involved in early trials work were LM730, on which the aerodynamic effects of the reception coupling fairing were evaluated, and W4963 which was used to investigate performance.

## **Second Quebec Conference.**

During their five-day transatlantic voyage to Canada in September 1944 Churchill and his Service Chiefs held preparatory discussions before meeting President Roosevelt and his Chiefs of Staff for the Second Quebec Conference. Among the subjects considered was British participation in the bombing of Japan, as the minutes recorded:<sup>17</sup>

‘The positions of probable Allied land bases makes us dependent on aircraft of very long range. We have no long range bombers but steps have been taken to improve the range of the Lancaster by flight refuelling for which the aircraft operate in pairs; one as a bomber, the other as a tanker. The Lancaster bomber thus operated is expected to carry a bomb load of 4,000 lbs over a safe radius of action of 1,500 miles. Preparations are in hand to modify aircraft for this purpose, to perfect the refuelling technique and to train crews. In view of their range, the most suitable areas for basing of Lancaster refuelling aircraft would seem to be Formosa or the Chinese coast. Potential accommodation in this area is limited, but the base requirements of the Lancaster are comparable with those of the B-17 or B-24 and may be easier to provide than those of the B-29 aircraft. In the present state of development it would be unwise to plan on operating the force from bases further from Japan.

British planning and participation cater for a force of 40 squadrons of Lancasters for the direct attack on Japan; 20 squadrons of tankers and 20 as bombers. The whole force can readily be converted to normal Lancaster bombers.

The exact date of deployment of this force cannot be determined until the date of availability of bases is known and the priority for the movement of the units decided. Assuming that squadrons can start withdrawing from Europe by 1st October, the earliest date by which the first squadron might be ready for operations is probably the early summer of 1945; the whole force being completed by September or October 1945 – provided that the necessary priority is given to their movement.’

The Combined Chiefs of Staff were recommended to agree that

flight-refuelled Lancaster bombers would participate in the bombing of Japan. Approval in principle was given at the Conference, and the British Chiefs of Staff were invited to submit further details to provide a basis for planning. On 27 October, the US Chiefs of Staff released a signal welcoming the offer of British participation in the bombing of Japan, while recognising that the deployment of Lancasters would be governed by availability of suitable air bases.

### **Early Proposals for an Order of Battle.**

The composition of the VLR Force changed several times, reflecting progress with the war and the availability of aircraft and squadrons. In October 1944, it was expected to comprise three Groups of Lancasters (or Lincolns), each having six bomber squadrons and six refuelling squadrons, together with six long-range fighter squadrons, initially to be equipped with the Mustang, pending deliveries of Hornets. The bomber squadrons that had been earmarked, as at 17 November 1944, are listed at Figure 1.

At this stage it was anticipated that Lancaster III tankers would begin to become available from 15 February 1945 with Lincoln IIs joining them from May, although neither of these dates would be realised. In the case of the Lincoln, an initial production contract had been placed in August 1943 and the first prototype had flown (as the Lancaster IV) in June 1944. Subsequent deliveries were delayed by problems with engine and propeller vibration and a lack of priority owing to Avro's concentration on civil aircraft for the post-war commercial market.

### **Advantages and Disadvantages of Employing Flight Refuelling.**

Operating from Formosa, the bombers would require a 1,500-mile radius of action in order to reach industrial targets in southern Japan, but with its standard fuel tankage and current weight constraints, it was calculated that the Lancaster III would be able to deliver only 3,600 lb of bombs.<sup>18</sup> The options available to improve this performance were an increase in fuel capacity or refuelling in flight and, since the latter was Air Ministry policy, planning was based on that assumption.

It was envisaged that tankers and bombers would fly as pairs until each had consumed 1,200 gallons of petrol at which point, about 1,000 miles outbound, the tanker would refuel the bomber and return to

<b>Group</b>	<b>Squadrons</b>
<p>One Group, formed mainly from RAF personnel, to remain in the UK until required for operations in the Pacific. Included in this group would be two RAAF squadrons.</p>	<p>Nos 9, 12, 44, 57, 83 (pathfinder), 90, 115, 150, 156 (Pathfinder), 218, 460 (RAAF) and 467 (RAAF) Sqns.</p>
<p>One Group, largely manned by Canadian personnel, to assemble in Canada before proceeding to the Far East.</p>	<p>Nos 405 (Pathfinder), 408, 413 (in Coastal Command at that time) 415, 420, 424, 425, 426, 427, 429, 432, and 433 Sqns. Canadian participation was subsequently amended so that four squadrons (Nos 413, 432, 433 and 434) would remain in the UK, while others (Nos 405, 408, 415, 419, 420, 424, 425, 426, 427, 428, 429, and 431 Sqns) would proceed to the Far East.</p>
<p>One RAF Group to be deployed ex-UK but retained in Air Command South East Asia (ACSEA) until required for operations in the Pacific.</p>	<p>Nos 7 (Pathfinder), 15, 97 (Pathfinder), 101, 166, 617 Sqns.</p>
<p><i>Fig 1. Bomber squadrons earmarked for the projected VLR Force as at 17 November 1944.</i></p>	

base, extending the range capacity of the bomber by about 1,000 miles or permitting it carry a correspondingly greater weight of bombs. Refuelling in flight also meant that aircraft could operate at normal, rather than overload, weights, from standard, rather than extended, runways, and it was also possible to demonstrate savings in terms of crews and aircraft per ton of bombs dropped.

The range and bomb load capabilities of flight-refuelled Lancasters and Lincolns were examined in detail in December 1944, when Bomber Command's reluctance to adopt this techniques was again apparent. Based on European experience, this exercise resulted in the following estimated figures:<sup>19</sup>

<b>Type</b>	<b>TOW</b>	<b>Bomb load/ROA</b>
Lancaster III non-refuelled	65,000 lbs	4,000 lbs/1,100 miles
Lancaster III flight refuelled	65,000 lbs	7,500 lbs/1,500 miles
Lancaster III overload	70,000 lbs	4,000 lbs/1,300 miles
Lancaster III overload	72,000 lbs	4,000 lbs/1,500 miles
Lincoln non-refuelled	75,000 lbs	4,000 lbs/1,150 miles
Lincoln flight refuelled	75,000 lbs	7,500 lbs/1,500 miles
Lincoln overload	83,000 lbs	4,000 lbs/1,500 miles

Although flight refuelling appeared to be a comparatively straightforward technique, it was foreseen that significant difficulties might be encountered if it were to be employed under large-scale operational conditions in the Far East. Because refuelling in the dark was considered to be impractical, the force would be committed to launching in daylight followed by a prolonged period of formation flying by many pairs of aircraft in close proximity. With several hundred aircraft within a small area of sky, it was feared that radio communications would produce 'indescribable chaos'. Further complications could arise from failure to make contact as a result of

unserviceability, crew error or adverse weather.

In view of the anticipated problems, while flight refuelling was still official policy, and planning was to continue on that basis, alternative means of extending range and/or increasing bomb load were also to be examined. Bomber Command's preference was simply to operate at overload weights and, when reviewing current proposals for the VLR Force in December 1944, the Deputy Director of Plans had indicated that the Ministry had also begun to question the feasibility of the air-to-air refuelling concept.<sup>20</sup>

'We are naturally anxious to use our aircraft without the necessity for refuelling in the air if possible, as flight refuelling is bound to be a difficult business, fraught with dangers, within range of enemy fighters, and most uneconomical in the use of aircraft.'

The case for operating bombers at overload weights was strengthened by the attacks that had been made against the German battleship *Tirpitz* by Lancasters of 5 Group in November 1944. The bombers had been fitted with additional fuel tanks and Merlin 24 engines, and had had 2,300 lbs of equipment – including one crew member – removed. Carrying a 12,000 lb TALLBOY, the aircraft had taken off at an all-up weight of 68,500 lbs – 3,500 lbs above the current maximum – and then flown a round trip of about 2,400 miles.<sup>21</sup>

By the turn of the year, the Lancaster III was being cleared for operation at an all up weight of 72,000 lbs for 'very special operations' and it was considered that this might have become the normal operating weight by the time the aircraft were required in Formosa. If so, this would provide a radius of action of 1,500 miles – more than sufficient to reach Tokyo with a 4,000 lb bomb load. If the Lincoln could be cleared to 83,000 lbs it would have the same performance, making it nearly comparable with the B-29. At these higher weights, runway performance in tropical conditions would be marginal, however, and AOCinC Bomber Command suggested that this could be overcome by using rockets to boost take offs and fitting reverse pitch propellers to reduce the landing run.<sup>22</sup>

**Initial Deployment Plans.**

The time required to deploy the projected VLR Force had first been considered in detail in May 1944 when, somewhat optimistically (even unrealistically, since the Allies had not yet even landed in France), it had been assumed for the purposes of a planning exercise that the German war would be over by 1 October and that the Force would promptly begin to redeploy to the Far East. To meet that commitment eight squadrons, already equipped for flight refuelling, would have been required by 1 October, followed by another eight every month until February 1945.

In order to train and equip the first eight squadrons, however, it would have been necessary to withdraw them from the line for at least a month, which would clearly have been unacceptable while the European bombing campaign was still under way. It would not, therefore, have been possible to start the programme until Germany had been defeated. If this actually occurred on the notional 1 October, the first squadrons would not be ready to move until mid-November, which was just as well, as it would take at least six weeks for the ground echelon, which was to travel by sea, to reach the Far East.

At a meeting of the VLR Force's Redeployment Sub-Committee held on 16 February 1945, ACAS(P) stated that the American Service Chiefs had confirmed their earlier agreement in principle to the participation of the VLR Force in the Pacific. It would probably operate under the command of the USAAF's 20th Bomber Command, but would be expected to be largely self-supporting. It was noted that flight refuelling experiments were underway, although a decision as to whether to continue with these would depend on the extent and cost of modifications. It was also noted that the Force Commander Designate (AVM Lloyd) favoured abandoning this scheme.<sup>23</sup>

At a further meeting, on 24 February, a planning date of 1 April was assumed for the end of the German war, and it was estimated that it would then take seven months for the first Group to be deployed to the Pacific. This initial force was to consist of eight VLR bomber squadrons plus one of PR/Met Mosquitos.

Lincolns were not now expected to begin to appear until August 1945, although, it was estimated that some 540 Lancasters would have been modified for refuelling before production eventually ceased in February 1946.<sup>24</sup> Nevertheless, it was still intended that the RAF and

Canadian Groups, each at 200 UE,<sup>25</sup> would be equipped with Lincolns before they moved to the Pacific while the ACSEA Group, also at 200 UE, would deploy on Lancasters which would then be retained until Lincoln production caught up.

Whichever aircraft were involved, it was necessary to specify the required performance, which was stated to be a range of 3,000 miles (1,500 miles radius of action) with 14% fuel reserves while delivering a 6,000 lb bomb load.<sup>26</sup>

### **The Creation of Tiger Force.**

In 1944 the codename MOULD had been assigned to cover the initial administrative planning for the deployment of the VLR Force. On 14 February 1945, a 'Nucleus Planning Staff – VLR Force' was established as a lodger unit at HQ Bomber Command at High Wycombe.<sup>27</sup> Ten days later AVM Sir Hugh Lloyd was appointed as Commander Designate. In April, when AVM H V Satterly joined him as SASO, Lloyd was promoted to air marshal and on 3 May his nascent unit was renamed as the 'Nucleus Planning Staff – Tiger Force'.<sup>28</sup> The inevitable expansion of the staff created a demand for more office space which was satisfied by relocating to Transport Command's HQ at Bushy Park in April, where Tiger Force HQ was formed on 9 July.

### **Progress with Flight Refuelling.**

By late February 1945 the situation was somewhat fluid. A firm commitment to flight refuelling was still awaited and, while the alternative of using overloaded aircraft was gaining support, the viability of this technique had also yet to be demonstrated. In the meantime, FRL was to continue development work 'even if only as an insurance.'<sup>29</sup>

Several problems had been encountered during early testing, but most of these had been overcome by early March. Subsequent flight trials had proceeded satisfactorily, and the first successful full-load transfer was carried out on 17 April, when 1,100 gallons of fuel were passed in 12.2 minutes.

Notwithstanding these teething troubles, at a meeting with the MAP on 16 February, FRL had been sufficiently confident of a successful outcome that they felt able to state that development had reached a stage where it could be considered 'complete and capable of

operation', although some additional modifications might be necessary. This enabled progress to be made in fitting out the remaining aircraft earmarked for the development programme.<sup>30</sup> The equipment for the remaining thirty-nine aircraft (the rump of the initial order for fifty aircraft-sets of which the first eleven had been allocated to FRL and BDU for trials work) was to be stored until the end of the war in Europe, when the aircraft would be modified and crew training started.<sup>31</sup>

It was anticipated that Lancasters modified to accept refuelling equipment would begin to leave the production lines during February. Removable parts were expected to become available from March, reaching a total of 350 sets of each (tanker and receiver) by the end of June. RAF St Athan was nominated as the storage and installation depot for flight refuelling equipment; after modification, aircraft would be held at Rhoose and Llandow pending delivery.<sup>32</sup>

### **Flight Refuelling is Cancelled.**

At a meeting held in VCAS's office on 18 April 1945, it was concluded that 'owing to the decision to concentrate on the Lincoln, the flight refuelling scheme for Lancasters and Lincolns should be abandoned.'<sup>33</sup> Nevertheless, despite the Air Staff's reservations over its viability as an operational concept, BDU's trials programme would continue (*see below*), even it was not to be used against Japan, since it would be useful to establish whether refuelling in flight really was a practical proposition for ordinary Service pilots.<sup>34</sup>

Although it was now a lost cause, FRL produced a paper at the end of April claiming that flight refuelling '. . . enables a far greater weight of bombs to be dropped on a distant target for a given number of bomber aircraft, as compared with a non-refuelled operation.'<sup>35</sup> As an example of the economies that could be realised, it considered the case of three bombers, capable of flying a 3,000 mile unrefuelled round trip, each delivering 4,000 lbs of bombs. These could be replaced by a single bomber of the same type, carrying a 12,000 lb bomb load but refuelled 900 miles from base. The total distance flown by the three aircraft would be 9,000 miles, compared to only 4,800 for the bomber/tanker combination – and the use of two crews instead of three would also yield substantial savings in manpower and their associated training costs.

It was all to no avail, however. Of the first fifty aircraft earmarked for modification, only the first eleven would now be completed. Orders for 200 sets of equipment for Lincolns that had been placed on 1 February were cancelled, together with an earlier order for Lancaster equipment that had already been reduced from 500 sets to 350. Abrupt cancellations of orders are not always sufficient to overcome the momentum within the supply chain, however. Most of the raw materials for the original 500 sets had already been supplied to sub-contractors,<sup>36</sup> and for some time afterwards, hoses and other components continued to 'pour in' to Staverton. Cobham obtained a contract from the MAP to store this material, and in his biography, he recalled his feelings:<sup>37</sup>

'I took it as philosophically as I could and soon earned high praise from a visiting officer on account of the care with which I was storing this fantastic amount of government stuff which was now on my hands. This wasn't because I loved the government. I had suffered a major set-back; I had made a colossal effort and then seen it come to nothing, but I wasn't finished yet. I already had my eye on the future. Civil aviation would soon start up again, and I wanted to be well placed to give it the crucial help that it would need. Aircraft still had short ranges; that heap of junk would be useful, and I intended to cherish it.'

### **Saddle Tanks.**

With flight refuelling no longer in the picture, so far as Tiger Force was concerned, priority would now be given to developing the Lincoln. The plan now called for the first four squadrons to be ready by 15 November, to be joined at a rate of another four per month until the force had built up to a total of twenty squadrons.

To provide the necessary range/bomb load capability it would be necessary to carry a greater fuel load and, using the Lancaster as a basis, various means of augmenting fuel capacity were explored, involving combinations of bomb bay tanks, 'Tirpitz-style' fuselage tanks and, the ultimate option, a 'saddle tank'. Range and bomb load were calculated for each configuration, assuming a takeoff weight of 72,000 lbs, with the mid-upper turret removed, and 350 gallons of fuel remaining.<sup>38</sup>



*One of the two Lancasters fitted with saddle tanks for trials in the UK and India. Via [military-aircraft-photos.com](http://military-aircraft-photos.com).*

The most promising solution involved fitting a saddle tank, exploiting a trial that had originally been carried out in May/June 1945 a Lancaster I (HK541) had been provided with a prototype tank which fitted on top of the fuselage and faired into the cockpit canopy. After initial handling trials in the UK, this aircraft had been flown out to India for tropical trials with No 1577 (Special Duties) Flight.<sup>39</sup>

It was calculated that, with a 1,200 gallon saddle tank plus the standard installed tankage of 2,154 gallons, the Lancaster, operating at weights up to 72,000 lbs, would be able to approach the basic requirement of a 1,500-mile radius of action with 14% reserves while delivering a 6,000 bomb load. The Lincoln, operating at weights up to 82,000 lbs with the same saddle tank and installed tankage of 2,950 gallons could do the same but with 22% reserves. An initial forecast, dated March 1945, envisaged that by 1 October 200 Lancasters and 200 Lincolns could be provided with a saddle tank.<sup>40</sup>

By late May 1945, it had been decided to stop work on the saddle tank for the Lancaster, although with the resurgence of interest in the concept a second trials aircraft (SW244) had been prepared and this was flown out to India in August. In the meantime, the design of a slightly smaller, 1,000-gallon, installation for the Lincoln was begun,

although this programme was also cancelled before any modified aircraft, tentatively assigned the designation of Lincoln III, had flown.

### **Basing Options.**

In March 1945, Air Mshl Lloyd visited Washington to discuss with the American Chiefs of Staff the allocation of airfields and facilities for Tiger Force. Despite the inevitable competition from US forces (the UK-based 8th Air Force was also expected to redeploy to the Pacific after the fall of Germany), he was tentatively offered a base in the north of Luzon in the Philippines. In April, this was changed to the island of Miyako Jima, only 1,100 miles south-west of Tokyo – subject to its capture, of course – and on 17 May the Air Ministry cabled a formal request for Miyako Jima to be allocated to the VLR Force. The Americans' plans changed, however, and capture of this island was postponed.

In April, with a realistic prospect of being able to operate from island bases only a few hundred miles from the intended targets, AVM Satterly had revisited the range and fuel requirements.<sup>41</sup> The Lincoln could now reach all important targets with its standard fuel load, obviating the need for saddle tanks or any other form of overload tank. The Lancaster could reach all targets south of Tokyo but to reach the capital itself it would require an additional 400 gallons of fuel. This could be provided by two removable 200-gallon bomb bay tanks, which still left one bomb station free; alternatively, if the Lancaster could be authorised to operate at the anticipated increased all-up weight of 72,000 lbs, its bomb load could be correspondingly increased when operating against targets south of Tokyo. Either way, as with the Lincoln, there was no longer any need for a saddle tank, hence its cancellation in May.

When the Americans finally overcame Japanese resistance on Okinawa in June 1945 they offered basing facilities, to be shared with USAAF B-29s, on the island for an initial ten British squadrons, with a total of 220 aircraft. Additional RAF squadrons would be accepted later as required. This was a very satisfactory arrangement as Okinawa was only 800 miles from Tokyo, which meant that Lancasters should now be able to deliver 15,000 lbs of bombs and Lincolns some 18,000 lbs, without any of the payload/range problems that had plagued earlier calculations.

In a further meeting with American Chiefs, Air Mshl Lloyd discussed such considerations as airfield construction, areas of responsibilities, and the phasing and acceptance of convoys. The Americans were planning to have two Groups of B-29s operational on Okinawa by mid-August, four more by mid-September, and a total of twenty by January/February 1946. Engineers were already working on airfield construction, and more would be sent to complete six strips for US bomber groups. The Americans would be responsible for port development and defence, while the British would provide logistic support and their share of road and airfield construction.

In July, Lloyd flew out to the Pacific Theatre to meet local commanders and survey airfields and accommodation. In addition to commenting on operational matters, his report contained some blunt criticisms of the domestic arrangements. For example: 'Our hutting is designed for winter on the Yorkshire moors and not a sub-tropical climate. I would like to imprison some of the clowns concerned in this hutting for six months in an Okinawa summer.'<sup>42</sup>

### **Selection of Equipment.**

The ending of the German war on 8 May 1945 permitted planning for the deployment of Tiger Force to gain momentum, although its composition and the associated dates continued to change to reflect uncertainties in aircraft availability and modification states, and the availability of bases. Before the month was out, the stated intention was to equip the main force with tropicalised Lancaster VIIIs, modified to operate at an all-up weight of 72,000 lbs with one 400-gallon bomb bay tank, no mid-upper turret, the new FN82 tail turret and appropriate radio and navigation aids.<sup>43</sup> The radio/radar fit was discussed at a meeting held at the Telecommunications Research Establishment (TRE) at Defford on 8 June when it was decided that it should include:

- GEE Mk III
- REBECCA Mk II
- LORAN Mk I
- a radio altimeter
- IFF
- twin VHF radios
- a radio range receiver



*A post-war Lancaster B.1(FE) of No 35 Sqn wearing the black and white scheme that had been specified for Tiger Force. MAP*

- Marconi HF W/T
- H2S Mk III G or H.

This equipment was to be installed by No 32 MU at St Athan whence selected aircraft were to be flown to Waddington and/or East Kirby to have enlarged bomb doors and equipment associated with the TALLBOY bomb fitted by civilian working parties.<sup>44</sup> A Lancaster VII modified to Tiger Force standards was inspected at Defford on 1 August.

Since 1 May, all new Lancaster production, Mk I, III and VII, had been delivered to No 41 Group and held in store to meet the requirements of Tiger Force.<sup>45</sup> Because there was some uncertainty over the reliability of supplies of American-built engines, however, it was decided not to use the Lancaster III with its Packard Merlins. The first Lancaster VII, the preferred variant, had begun to roll off the production lines (they were being built by Austin Motors at Longbridge) in April and, to permit crew familiarisation to be undertaken, the first eighty aircraft were required by 15 July, with another eighty in August and subsequent production continuing to a total of 450 aircraft.<sup>46</sup> This was a somewhat optimistic target, however, and, in the event, it proved necessary to use Mk Is as well.

Aircraft destined for the Far East theatre were designated Lancaster B I(FE) and B VII(FE) and finished in a tropical scheme of black undersurfaces with white top and sides.

### **Training.**

The first units earmarked for the Pacific were withdrawn from operations on 18 May and transferred to the control of HQ Tiger Force. Work promptly began to select and train crews to the required standard. For RAF and RAAF units, this programme was to be overseen by HQ 5 Gp, but the Canadians of No 6 Gp were to fly back to Canada for an initial training period before returning to the UK for possible re-equipment with Lincolns, before deploying to the Pacific.<sup>47</sup>

In addition to navigation and bombing training, crews were to be familiarised with the geography of the Far East theatre, the air/sea rescue organisation, aircraft maintenance and medical factors. In addition to technical training on radio and radar equipment, ground personnel were also to undergo battle training in preparation for airfield defence duties.

Flying exercises began in June and included 12-hour flights around the UK, to gain proficiency in navigation and fuel management on long range/duration sorties. Bombing practice and fighter affiliation exercises were carried out in the training areas of Yorkshire and Lincolnshire.

### **The Evolving Order of Battle.**

For planning purposes, by late May 1945, the force was expected to comprise:<sup>48</sup>

- Twenty heavy bomber squadrons at 20 UE.
- One Mosquito pathfinder squadron at 30 UE.
- One Mosquito Met squadron at 16 UE.
- Four transport squadrons at 30 UE.
- One air/sea rescue squadron of Lancasters at 20 UE.

As before, this force was to be organised as one British and one Canadian Group, with a third, British, Group remaining in SEAC as a reserve in case reinforcement was required. Although it was intended that the force should ultimately be mounted on Lincolns, these were not now expected to be available for the initial deployment. The first four bomber squadrons (and one Mosquito squadron) were to be operational by mid-October, with the next four bomber squadrons following a month later.

It was recognised that an initial deployment of just four squadrons

would be insufficient either to carry out effective area bombing or to destroy smaller precision targets so early attacks could have little more than a 'nuisance' effect, their main value being to accumulate experience of in-theatre operations. When the force had built up to eight squadrons, however, it was anticipated that its destructive power, focused by the use of H2S and Pathfinders, would be sufficient for it to make some positive impact.<sup>49</sup>

On 6 June, it was decided to reduce the bomber element of Tiger Force to just eighteen squadrons, comprising eight RAF, eight RCAF and two RAAF units.<sup>50</sup> In the meantime the New Zealand Cabinet had given approval for the RAF contingent to include, the largely NZ-manned, No 75 Sqn.

General Spaatz, commanding US Strategic Air Forces in the Pacific, had specifically requested that the British contribution should include two TALLBOY-capable squadrons and Nos 9 and 617 Sqns were included in the Order of Battle to satisfy this request. By mid-June it was anticipated that the first ten squadrons to be deployed would comprise eight of Lancasters (five British, two Canadian and one Australian), including the TALLBOY squadrons, one of Mosquito B35 pathfinders and one PR/Met squadron with Mosquito PR34s.<sup>51</sup>

Almost inevitably, these plans were subject to change and by late July, the advance element had become nine Lancaster squadrons (six RAF – including No 75 Sqn – two RCAF and one RAAF) and the Mosquito pathfinder squadron. The follow-up force was now expected to comprise eleven Lincoln squadrons (four RAF, six RCAF and one RAAF) plus an air-sea rescue squadron with Lancasters and Catalinas, with the USAAF providing the necessary photo-reconnaissance and meteorological cover. The first five squadrons (the Mosquito unit, the two TALLBOY units and two main force units) were expected to be operational by 1 December, ten by 1 January and fifteen by 1 February; all twenty bomber squadrons were expected to be in-theatre and available for operations by 1 March.

Production delays, modifications, and development problems prevented the Lincoln from entering service until late August 1945, when the first few were delivered to No 57 Sqn, strictly on a trials basis, and it seems unlikely that, even if the war had not ended, they would have begun to appear in the Pacific much before the spring of 1946.



*Had the war continued into 1946, Tiger Force would eventually have been equipped with black and white Lincolns like this one, which was one of the first to be delivered to No 57 Sqn. MAP*

By July, the number of personnel allocated to Tiger Force was 34,200, including 2,500 Canadian engineers. Further reinforcing parties, air-sea rescue, and communications units would follow until the Force reached its full strength, estimated at 66,305 personnel, by mid-April 1946.

The planned Order of Battle as at 15 August 1945 was as follows:<sup>52</sup>

<b>No 5 Group, RAF</b> Comprising Nos 551, 552, 553, 554, and Special Missions Wings	
Comm Flight	Three Auster
<b>No 551 Wing, RAF.</b> Forming at Coningsby, to be operational by January 1 <sup>st</sup> , 1946	
No 83 Sqn	20 Lancaster B.1(FE) or B.VII(FE)
No 97 Sqn	20 Lancaster B.1(FE) or B.VII(FE)
No 627 Sqn	30 Mosquito B.35 (PF) Detached to Woodhall Spa
<b>No 552 Wing, RAF.</b> Forming at Metheringham, to be operational by January 1 <sup>st</sup> 1946	
No 106 Sqn	20 Lancaster B.1(FE) or B.VII(FE)
No 467 Sqn (RAAF)	20 Lancaster B.1(FE) or B.VII(FE)

No 544 Sqn	20 Mosquito PR(Met)34, forming at Benson
<b>No 553 Wing, RAF.</b> Forming at East Kirby, to be deployed in build-up 1946.	
No 57 Sqn	20 Lincoln B.II
No 460 Sqn (RAAF)	20 Lincoln B.II
<b>No 554 Wing, RAF.</b> Forming at Spilsby, to be operational by January 1 <sup>st</sup> , 1946.	
No 75 Sqn (RNZAF)	20 Lancaster B.I(FE) or B.VII(FE)
No 207 Sqn	20 Lancaster B.I(FE) or B.VII(FE)
<b>Special Missions Wing, RAF.</b> Forming at Waddington, to be called forward, late 1945.	
No 9 Sqn	20 Lancaster B.I(FE) or B.I (Special)
No 617 Sqn	20 Lancaster B.I(FE) or B.I (Special)
<b>No 6 Group, RCAF</b> Comprising Nos 661, 662, 663, 664 Wings plus one other.	
Comm Flight	Three Auster
<b>No 661 Wing, RCAF.</b> Formed at Yarmouth, Nova Scotia, to be operational by January 1 <sup>st</sup> , 1946	
No 431 (RCAF) Sqn	20 Lancaster B.I(FE) or B.VII(FE)
No 434 (RCAF) Sqn	20 Lancaster B.I(FE) or B.VII(FE)
<b>No 662 Wing, RCAF</b> Force build-up Wing	
No 419 (RCAF) Sqn	20 Lincoln B.II
No 428 (RCAF) Sqn	20 Lincoln B.II
<b>No 663 Wing, RCAF</b> Forming at Debert, for deployment early 1946.	
No 420 (RCAF) Sqn	20 Lincoln B.II
No 425 (RCAF) Sqn	20 Lincoln B.II
<b>No 664 Wing, RCAF.</b> Forming at Scoudouc, New Brunswick, for deployment early 1946	
No 405 (RCAF) Sqn	20 Lincoln B.II
No 408 (RCAF) Sqn	20 Lincoln B.II
<b>RCAF Wing</b> To be arranged later	

<b>Ancillary Units</b>	
ASR squadron	10 Lancaster ASR. III and 10 Catalina, not yet established.

Comm Flight	Six Auster, two Expeditor C.1, one Expeditor C.1 (VVIP)
Force Reserve	Nos 49 and 189 Sqns RAF with 20 Lancaster/Lincoln each.

### **Deployment – and Disbandment.**

The initial deployment plans had envisaged that the first ground echelons would sail on or about 30 June, with aircraft and crews beginning to fly out on or after 15 August. To pave the way, a survey party was dispatched to Okinawa by air while the first of seven convoys, carrying personnel, equipment, armament and vehicles, was being prepared. The first, SHIELD, comprising eight ships carrying 3,000 airfield construction personnel, 15,000 tons of construction equipment, 1,000 vehicles and a Mobile Field Hospital, sailed for the Ryukyu Islands via Panama at the end of June.<sup>53</sup> Components of the second convoy, VACUUM, sailed in July but other ships were delayed for a time due to a backlog of shipping at Okinawa, and the third convoy, FORTIFY, never left.

When the ships sailed, there was still no specific destination for the British force but on 12 August, a signal from HQ 20th Air Force advised that Futema airfield on Okinawa would be ready to accept Tiger Force in October – but by that time, of course, the Japanese war would have ended.

On 6 August, the day on which the first atomic bomb was dropped, Tiger Force's Advanced HQ Party left the UK in order to be established in-theatre in time to receive the first wave of the deployment.<sup>54</sup> A second bomb was dropped on the 9th and on the 10th Japan began to seek surrender terms. At 1800hrs that day the Force Commander announced that Tiger Force would not now be required to bomb Japan. Instead, it was to be used to establish a British Air Force of Occupation in Japan [BAFO(Japan)].

On 22 August, following confirmation of the Japanese surrender,<sup>55</sup> the Air Ministry directed that all Tiger Force squadrons (none of which had yet begun to move) were to be returned to the operational control of Bomber Command. Rather than being used to establish BAFO(Japan), however, HQ Tiger Force was disbanded on 15 September 1945, those elements of its Advanced HQ and of HQ 302 Wg which were already in, or en route to, the Far East were to be

merged and put at the disposal of ACSEA to form a new HQ 'provisionally to be known as Air HQ Hong Kong'.<sup>56</sup> Meanwhile the SHIELD and VACUUM convoys had been diverted to Hong Kong where their resources were to be used to assist in the re-establishment of a British administration, while the airfield construction units began to repair the damaged facilities.

### **The Aftermath**

#### **BDU Flight Refuelling Trials.**

Although it had been decided in April 1945 that Tiger Force would not employ flight refuelling, the Bomber Development Unit at Feltwell had been instructed to complete its trials programme. Ground training had begun in March with the flying phase being conducted between May and August using two tankers (ND574 and ND843) and two receivers (ND793 and ND991).

The first successful hook-up was made late in May and refuelling operations were subsequently carried out at altitudes between 5,000 and 20,000 feet, on two occasions after a 4½-hour cross-country flight. The average time from making contact to breakaway was 19 minutes (24 minutes at 20,000 feet) and the time taken actually to transfer 1,100 gallons of petrol was between 11 and 12 minutes. So far as the pilots were concerned, no difficulties were encountered in maintaining formation, although for the crewmen working in the rear fuselage, the operation became more difficult above 10,000 feet because of the low temperatures and the need to use oxygen.

The BDU Report concluded: 'Flight refuelling is undoubtedly a successful method of increasing the range and or bomb load of an aircraft, and the number of unsuccessful sorties during the trials was only two out of 36 flights...' Although it went on to acknowledge that, while a single aircraft could be refuelled without difficulty, 'the question of refuelling large numbers of aircraft in a short space of time becomes more complicated.'<sup>57</sup>

Meanwhile the problems of tanker/receiver interception and rendezvous were being addressed by the RAE and the TRE, and in a demonstration at Staverton, a system based on the use of REBECCA Mk II was shown to have a satisfactory performance over a range of some 50 miles.

Further trials were subsequently made with one aircraft homing

onto another using a radio compass (Bendix MN26) in the tanker and a normal MF transmitter (T1154 at 454 KHz) in the receiver, and this demonstrated that a successful rendezvous could be achieved, even in poor visibility, so long as the receiver's altitude was known.

### **Future Policy on Flight Refuelling.**

Following cancellation of the refuelling contracts associated with Tiger Force, AMSO noted that a very large sum of money had been spent on developing the technique and its equipment and that 'it would be a pity if no use were to be made of this work. (. . .) There seems to me to be little doubt that flight refuelling may well be of great importance to the Royal Air Force in the future, both for long distance bombing and for air transport work.'<sup>58</sup> In July 1945, the Directorate of Operational Requirements (DOR) issued a paper on flight refuelling, setting out advantages and disadvantages when employed with bomber and transport aircraft, and recommending that tactical trials should be carried out. It was pointed out that the original order for fifty sets of equipment was 80% complete and that, since the production facilities were still available, this could be brought up to 100% at comparatively small cost.<sup>59</sup>

Since the European war was over and deployment to the Pacific had yet to begin, large numbers of aircraft and crews were available to undertake trials on a relatively large-scale, and it was pointed out that such an opportunity was very unlikely to recur. It was recommended, therefore, that modification sets sufficient to equip two squadrons, at 20 UE each, should be completed and that a programme should be mounted to investigate the practical value of flight refuelling.

On 2 August, representatives of Bomber, Coastal and Transport Commands met at the Air Ministry to discuss the desirability of such a trial.<sup>60</sup> It was agreed that each Command would consider their requirements separately and submit proposals to the Air Ministry. Before any further progress was made, however, the Japanese war ended and priorities changed.

### **Flight-refuelled Transport Operations.**

Although flight refuelling had been ruled out for bomber operations in the spring of 1945, it was still under consideration in the context of freight flights to the Far East. At the request of HQ Transport Command, FRL prepared a report involving the use of



*Four of the eleven Lancasters allotted for wartime development were used for civil trials during 1946-47. Here, Lancaster tanker G-AHJW (ED866) refuels Lancaster receiver G-AHJU (LM681). FRL photo, neg. 167.*

Yorks. It was envisaged that a York would stage out to India via Malta, Cairo, Shaibah and Karachi, accompanied by a Lancaster tanker which would top it up on each leg. By taking off with a reduced fuel load, it was calculated that the York would be able to lift twice its normal weight of freight, and that the Lancaster would also have the capacity to carry up to another 6,000 lbs of small packages. Thereafter, the Yorks would shuttle back and forth between Bengal and the Philippines, refuelling in flight near Rangoon.<sup>61</sup> The ending of the Japanese war rendered Tiger Force unnecessary, however, and with it the need for supporting freight flights.

### **Postscript**

Of the eleven Lancasters allotted for flight refuelling development, the four BDU machines were scrapped; four other aircraft were used in post-war civil operational trials; one aircraft was written off, and two were retained by FRL for further development, including trials of

the 'probe and drogue' system in 1949-1951.

Some of the stored refuelling equipment was later refurbished, modified, and delivered to the USAF to meet an urgent requirement for flight refuelling B-29s of Strategic Air Command.

The first use of flight refuelling in combat operations was made in July 1951, when KB-29 tankers refuelled RF-80s over Korea.<sup>62</sup>

**Acknowledgements:** The author wishes to thank the Cobham Archives for granting access to its material, and the staff of The National Archives at Kew for their assistance.

**Notes :**

<sup>1</sup> Gardner, Brian; *Aerial Refuelling At Farnborough* (Air-Britain, 1999).

<sup>2</sup> Refuelling was carried out after take-off from Foynes Ireland and Botwood Newfoundland to a weight greater than maximum permitted take-off weight to permit a payload to be carried.

<sup>3</sup> Cobham Archives, FRL Report No.46, 'Refuelling Service Aircraft in Flight – Stirling Bomber', 20 June 1939.

<sup>4</sup> TNA AIR20/7. Minute from DOR to ACAS(OR&T), 1 June 1940.

<sup>5</sup> 'Flight Refuelling – The Position Today', Air Marshal Sir Robert Saundby, *The Aeroplane*, 28 November 1952. Reproduced by permission of Aeroplane Magazine/www.aeroplanemonthly.com Having been Director of Operational Requirements from December 1938 to April 1940 and Assistant Chief of the Air Staff (Operational Requirements and Tactics), April-November 1940, Saundby would have been directly concerned with these issues at the time.

<sup>6</sup> TNA AIR9/379. Refuelling in the Air, 14 January 1944.

<sup>7</sup> Cobham, Sir Alan (ed Christopher Derrick); *A Time To Fly* (London, 1978) p185. Reproduced courtesy of Shephard-Walwyn (Publishers) Ltd.

<sup>8</sup> The Greener gun was used by the coastguard to fire a line to ships in distress. FRL had adapted it to fire the grapnel and contacting line for its 'ejector' or 'looped hose' refuelling method.

<sup>9</sup> TNA AIR20/4744. VCAS to ACAS(TR), 18 February 1944.

<sup>10</sup> TNA AIR20/4652. ACAS(TR) to Director of Overseas Operations, 23 February 1944.

<sup>11</sup> TNA AIR9/379. Re:Desirability of homeward bound refuelling, DBOps to ACAS Ops, 18 March 1944.

<sup>12</sup> TNA AIR20/4744. Paper: 'The Interception Problem', DBOps, 6 March 1944.

<sup>13</sup> *Ibid.* Notes of Meeting held 25 May 1944 to examine the question of Lancaster flight refuelling.

<sup>14</sup> TNA AIR14/1440. ACAS(P) to AOCinC, HQ Bomber Command, 21 August 1944.

<sup>15</sup> TNA AIR20/3394. Minute from Director of Policy (Air), to AOCinC Bomber Command, 5 September 1944.

<sup>16</sup> TNA AIR20/4744. Report on Lancaster Flight Refuelling, 19 September 1944.

<sup>17</sup> TNA CAB99/29. Record of Octagon Proceedings, 5-20 September 1944, page

171.

<sup>18</sup> TNA AIR20/4744. HQ Bomber Command, Ops Requirements Section, 18 November 1944.

<sup>19</sup> TNA AIR20/5818. British Participation in the VLR Bombing of Japan, BOps1, 11 December 1944.

<sup>20</sup> TNA AIR20/4744. Deployment of British VLR bomber forces to the Pacific, DD Plans to Dir of Plans, Air Ministry, 13 December 1944.

<sup>21</sup> TNA AIR20/5818. British Participation in VLR Bombing of Japan, Appendix 'E', 'Tirpitz Attack' by BOps1 dated 11 December 1944.

<sup>22</sup> TNA AIR20/2744. Notes on Redeployment meeting of December 1944, and proposals to be put to VCAS. Minute from ACAS(Ops) dated 18 December 1944.

<sup>23</sup> TNA AIR14/1102. Minutes of the Second Meeting of the Redeployment Subcommittee on VLR Force for the Pacific, held on 16 February 1945.

<sup>24</sup> TNA AIR20/2720. Minutes of meeting held in VCAS's Office on 24 February 1945 to discuss preparation of Lancaster/Lincoln aircraft for Tiger Force.

<sup>25</sup> UE – Unit Establishment, the number of aircraft that a unit was intended to operate.

<sup>26</sup> TNA AIR14/1102. Aircraft For Operation Tiger, Summary of Conclusions reached at meeting held in VCAS's office on 24 February 1945.

<sup>27</sup> TNA AIR10/3931. Secret Organisation Memorandum 155/1945. Only lodged at High Wycombe, the Nucleus Planning Staff was actually subordinate to Technical Training Command's HQ 28 Gp for administrative purposes but was controlled directly by ACAS(P).

<sup>28</sup> *Ibid.* Secret Organisation Memorandum 1086/1945.

<sup>29</sup> TNA AIR20/4744. Flight Refuelling of Lancasters, memo 26 February 1945.

<sup>30</sup> One of the development aircraft was equipped as a 'hermaphrodite', with both tanker and receiver equipment.

<sup>31</sup> TNA AIR20/4744. Flight Refuelling of Lancasters, memo 26 February 1945.

<sup>32</sup> Cobham Archives, Cobham manuscript.

<sup>33</sup> TNA AIR20/4744. Minutes of meeting held on 18 April 1945 at VCAS's Office.

<sup>34</sup> *Ibid.* DD of Policy (G)1, memo dated 4 April 1945.

<sup>35</sup> Cobham Archives – The Military Economics of Flight Refuelling, FR/CE/106, dated 26 April 1945, FRL.

<sup>36</sup> Cobham Archives – Sir Alan Cobham's manuscript, 'Flight Refuelling Story, 1940 to the purchase of the company 1947'.

<sup>37</sup> Cobham; *op cit*, pp185-186.

<sup>38</sup> TNA AIR14/2045. Note on Fuel Tankage for Lancaster Aircraft of the VLR Force, HQ 5 Group, 28 April 1945.

<sup>39</sup> Mason, Francis K; *The Avro Lancaster* (Huddersfield, 1989) p234.

<sup>40</sup> TNA AIR20/3394. Saddle tank, minute dated 22 March 1945.

<sup>41</sup> TNA AIR20/2720. Memo by AVM Satterly, dated 26 April 1945.

<sup>42</sup> *Ibid.* Report on Force Commander's visit to Pacific, July 1945.

<sup>43</sup> TNA AIR14/895. Operational Requirements – Tiger Force, AVM Satterly, for Commander Designate, to UsofS, 22 May 1945.

<sup>44</sup> TNA AIR14/895. Minutes of a meeting, 'Lancaster VII Aircraft For Tiger Force', held on 8 June 1945.

<sup>45</sup> The Lancaster III differed from the Mk I primarily in having Packard-built Merlins. The Rolls-Royce powered Mk VII incorporated earlier Mk I/III modifications and had a Martin mid-upper turret positioned further forward.

<sup>46</sup> TNA AIR14/895. Minutes of meeting held at Austin Motors on 23 May 1945 to discuss production of the Lancaster VII for Tiger Force.

<sup>47</sup> TNA AIR23/1898. Memorandum on Training of Aircrews, Nucleus Planning Staff, Tiger Force, 6 July 1945.

<sup>48</sup> TNA AIR14/895. Air Ministry, ACAS Pol(G), to Nucleus Planning Staff Headquarters, 30 May 1945.

<sup>49</sup> TNA AIR14/2045. Operational Policy, Tiger Force, AM Lloyd to ACAS(P), 11 May 1945.

<sup>50</sup> TNA AIR20/2720. Minutes of meeting held 6 June 1945.

<sup>51</sup> TNA AIR14/1102. Minutes of meeting held under chairmanship of ACAS(P) in the Air Council Room on 14 June 1945.

<sup>52</sup> 'Tiger Force', Bruce Robertson, *Air Pictorial*, October 1974, p390. Reproduced with permission. Note that Nos 551-553 Wgs had originally been formed as Nos 349-351 Wgs on 25 May 1945 only to be renumbered on the 29th, and that Tiger Force was also to have had a dedicated transport wing, No 302, the HQ of which was formed at Ibsley on 1 July 1945.

<sup>53</sup> TNA AIR23/1897. Establishment of British VLR Force on Okinawa, 13 July 1945.

<sup>54</sup> TNA AIR24/1582. Tiger Force Operations Record Book.

<sup>55</sup> Confirmation of the Japanese surrender was broadcast by the Prime Minister at 0001 hrs on August 15.

<sup>56</sup> TNA AIR10/3932. Secret Organisation Memorandum 2121/1945.

<sup>57</sup> TNA AIR14/894. BDU Report No 84.

<sup>58</sup> TNA AIR20/7417, Memo from ACAS to VCAS, 1 June 1945.

<sup>59</sup> TNA AIR20/4744. Air Ministry, Director of Operational Requirements, 27 July 1945.

<sup>60</sup> TNA AIR14/894. Minutes of meeting held at Air Ministry on 2 August 1945.

<sup>61</sup> Cobham Archives – 'Flight Refuelling Techniques applied to Transport Operations in support of Tiger Force.' FRL Report No FR/CE/108, dated 26 June 1945.

<sup>62</sup> In addition to two B-29s modified to hose/drogue tankers for the USAF under Project Outing, eight KB-29M 'looped hose' tankers were modified by FRL to 'hose/drogue' configuration. The RF-80s were fitted with a probe on each wingtip tank.

## BOOK REVIEWS

**Dowding of Fighter Command – Victor of the Battle of Britain** by Professor Vincent Orange. Grub Street; 2008. £20.00

Professor Vincent Orange has made a great contribution to the recording of Royal Air Force history over a number of years, His major works on senior commanders – Park, Coningham, Tedder and Slessor – have been well received and his next book is always eagerly awaited. This volume (a 320-page hardback with 53 b/w photographs) is no exception, although so much has been written about Lord Dowding, his travails, his achievements and his perceived failures, that it was questionable just how valuable it could be. Vincent Orange has clearly aimed to produce the definitive work on Dowding, just as his friend and mentor, Henry Probert, did for Harris. It can claim the authority of his own immersion in the history of the Service and of an encyclopaedic and catholic list of sources, published and primary.

Perhaps inevitably, one approached this book with three principal questions in mind. First, what new information on Dowding could it provide? Next, how complete a picture of the man and his career would it offer? And, finally, how objective and rigorous an account would Vincent Orange present to his reader?

The odds against finding anything new to be said about a man whose controversial career has been crawled over and analysed by generations of historians and other writers are considerable. Indeed, the listings of source material cited in this volume illustrate that point, given that they include many from secondary, published sources. The picture is perhaps further complicated by the author's use of many references to his own earlier work on Park, which rather obscures the sources upon which his comment is based. Many of the associated passages in this present work are near-verbatim extracts from the Park biography.

Perhaps the most significant 'new' facts that emerge and are well described, relate to Lord Dowding's personal grasp of technology, to its evaluation, and to its practical application at a time of rapid innovation and development. His approach to the integration of available sensors into the Dowding System is well known but the book provides numerous other examples of his methodical approach to evaluating new and established equipment and procedures and paints a

very compelling picture of this aspect of his character. The contrast between his personal evaluation of an experimental AI radar at Martlesham Heath in June 1939, seated on a plank of wood, under a shroud in the back of Fairey Battle and that of Herman Göring, ensconced in an armchair in the cabin of a Ju 90 at Werneuchen in 1942, could not be more stark. Where Dowding immediately impressed by his grasp of the potential and application of the equipment which saw its realisation in the AI-equipped Beaufighter, Göring was dismissive of expecting his crews to sit, as he put it, in a cinema! Professor Orange casts a new and very positive light on Dowding's often derided mission to the USA in 1941, generously acknowledging his own failure in the past to appreciate its success. He is similarly approving of the findings of Dowding's inquiry into RAF unit establishments, his final job, but suggests that little was done to implement them.

The completeness of Vincent Orange's account of the life of Lord Dowding is impressive and well over 800 references in a list of 679 endnotes are witness to his diligence in exploring his subject. He succeeds admirably in defining Dowding's character, not least by setting in perspective the nickname 'Stuffy' which is both accurate and at the same time misleading. He leaves the reader with a much clearer idea of the man, his moods and manner. The controversial aspects of his tenure as CinC Fighter Command and the manner of his departure are well and sympathetically described.

It is in considering my third question as to the objectivity and rigour of Professor Orange's assessment of Lord Dowding – and of his many detractors and adversaries – that I have to confess to moments of unease. This volume hints at the attitudes and prejudices of its author as much as it does those of its subject. One is left in no doubt that Vincent Orange's sympathies lie with Dowding in his many challenges to the Trenchardist orthodoxy of the time. He is fiercely dismissive of the Air Ministry, of Bomber Command and of the Staff College and of all those in any way associated with these organisations. He even takes a swipe *en passant* at the Official Historians, as mere creatures of the Ministry. A degree of stereotyping evident in his characterisation of those in his sights; his view of these targets borders, unfairly in my view, on contempt! It might further be argued that there is a degree of naïvety in his very black and white

view of affairs, not least in a failure to give due weight to the game of catch up that was, perforce, being played in all areas of Defence in 1940.

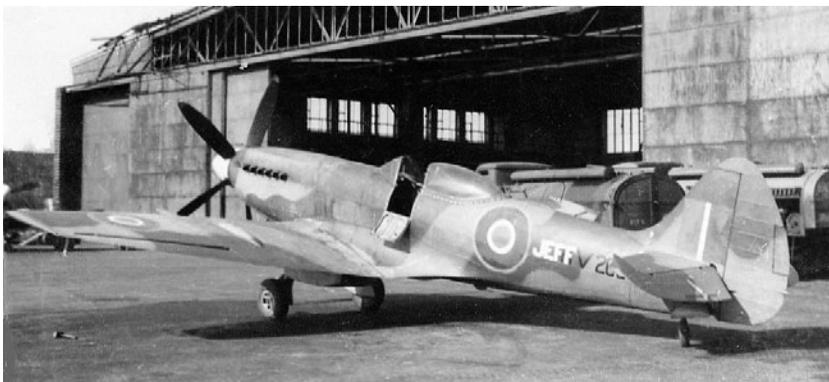
He may well be right in his undisguised preference for Dowding over Ellington, Newall or Douglas, or for Park over Leigh-Mallory. However, one is left with a nagging concern that total balance has not been achieved, for all the occasional acknowledgement of weakness on the part of Dowding himself. Vincent Orange's reliance on the so-called 'Dowding History', 'an 84 page manuscript written by Dowding in 1956 to assist Basil Collier with his biography and later also used by Robert Wright' places a considerable onus on the objectivity of what almost inevitably must have been an *apologia pro vita sua*. However, it must be said that the account of Dowding's removal from Fighter Command is balanced, fair and generally objective in his handling of all parties.

That all said, as is always the case with Professor Orange, this is a well written and important book and its completeness and readability will allow readers to decide for themselves whether any of my occasional unease is justified. Certainly, it must rank as the major work on Lord Dowding and it is none the worse for making its reader think twice about its judgements and their justification.

### **AVM Sandy Hunter**

**Combat Codes** by Vic Flintham and Andrew Thomas. Pen & Sword; 2008. £30.

Members may recall that I reviewed this book, very positively, when it first appeared in 2003. So far as the nature of the content is concerned, I can do no better than repeat my summary from Journal 29: '*Combat Codes* is essentially a series of lists of tabulated data, although there are explanatory essays on the concept of codes and the way in which their use evolved, along with some useful notes on how to use the book. The core of the content is provided by a series of tables dealing with the pre-war, the wartime and the post-war RAF, but these are complemented by similar tables covering the wartime identification codes used by the FAA and the RCAF, RNZAF, RAAF, SAAF and the Indian Air Force plus US Army and USAAF units operating in the European and Mediterranean theatres. It does not stop there either, as post-war coverage is extended to embrace the



*Combat Codes* includes a comprehensive listing of ‘personal’ codes. Your editor particularly likes this one, which is noted, but not illustrated, in the book. Seen here at Utersen shortly after the end of the war in Europe, it is a Spitfire LF XIV, MV263, that belonged to OC 126 Wg, Wg Cdr G E ‘Jeff’ Northcott.

continued use of the wartime system by (mostly European) air forces until it finally faded away (in Norway) in 1970. The RAF picture is brought right up to date with an explanation of the logic behind the various systems of tail codes that it has employed since the 1970s. Last but not least, there is a list of all known ‘personal codes’ reflecting the good old days when a Wing Leader expected to be able to adorn ‘his’ aeroplane with his initials. [. . .] To amplify this mass of tabulated information there are no fewer than 280 photographs’ – and I guessed that well over 80% of these were being published for the first time.

Unfortunately, the book’s original publisher, the late-lamented Airlife, went into liquidation not long afterwards so the book went out of print before it had really had an opportunity to establish itself as the valuable work of reference that it undoubtedly is. Fortunately, Pen & Sword have stepped into the breach and it is now available again. Still in hardback, it is in a slightly smaller format, which means that it runs to more pages – 272 in quarto versus 246 in the earlier A4(ish). This has meant some rejigging of the content, but it has all been retained, as have all of the original pictures plus a shot of a Eurofighter Typhoon.

When this book first appeared, I observed that, while it was ‘as good as it gets for the time being’, there were ‘still gaps to be filled

and (*that the authors had made*) no attempt to hide them, indeed known omissions and uncertainties are italicised throughout.’ The publication of a second edition has provided the opportunity to update and amend the original; these changes are very subtle, of course, amounting to alterations to occasional entries embedded within densely composed tables or merely a change in typeface – but they are there – so it is definitely worth investing in the new edition.

It is excellent news that this book is available again and the cherry on the cake is that the price of the revised second edition has been brought down to a far more reasonable £30, compared to the rather eye-watering £45 of the first edition. If you are a researcher, you just have to have a copy.

**CGJ**

**Missing Believed Killed. The Royal Air Force and the Search for Missing Aircrew 1939-1952** by Stuart Hadaway. Pen and Sword: 2008. £19.99.

I can think of no better way to set the scene for potential readers of this book than to quote the last two sentences of the author’s text. He writes; ‘In the age before computer databases, DNA testing, or any effective form of biometric records, the Air Ministry went out to search for 70,000 needles in an unimaginably large haystack. More incredibly still, for the most part they found them.’

It seems, perhaps, that this is not a book to be read primarily for enjoyment, given its somewhat sombre subject matter, but rather for enlightenment about the efforts which were made to meet the concern, which was increasingly expressed during the wars of the 20th Century and remains very much present today, for clear identification of individuals lost in battle and their final resting places. However, in fact it does offer enjoyment, of the same sort that one gets from a good ‘police procedural’, which is to be found in the fascinating nature of much of the ‘procedure’ described and discussed here. It has never been the case that relatives would be satisfied by the generality of any ‘corner of a foreign field’; what they want is certainty about its location. The task of locating, and in many cases identifying, the remains of the fallen was an enormous undertaking given the global scale of the conflict in WW II. We are shown here how such work was done, often with very limited resources and, as in the Far East in

particular, in what could be remote, dangerous and inaccessible places. The author provides an authoritative account of the evolving organisations set up to carry out the work which involved the forensic, detective and documentary research skills that were needed. His text is enriched by numerous extracts from official documents and also from informal ones passing between the workers at the time. He cites letters to and from casualties and includes eyewitness accounts of recovery operations.

The overall responsibility for dealing with casualties came to lie with P4(Cas) which was set up on 16 October 1940 as a Branch of the Directorate of Personal Services. For losses in the UK the earliest on the scene from a practical point of view had been the Wreck Recovery Units who worked with local Maintenance Units. In the Battle of Britain for example, No 49 MU was responsible for some 1,400 square miles of Kent alone over which they had to clear up aircraft wreckage and retrieve bodies. Such work had a high priority because of the adverse effect on public morale which could result from the presence of downed British aircraft in the countryside. However, as the war progressed aerial warfare took place over thousands of square miles which presented particular difficulties for the location of wrecks and the reclamation of bodies. By 1941 the workload was getting beyond the initial resources of P4(Cas) and an addition to it, the Missing Research Section (MRS) was authorised. The section was small and led by Flt Lt A P LeM Sinkinson who continued in his role as a lynch-pin of the RAF's efforts to trace its aircrew for eight years. In December 1944 a team known as the Missing Research and Enquiry Service (MRES) had been formed and arrived in Paris where they soon realised that they would be unable to cope with the sheer volume of outstanding cases. By March 1945, No 1 Missing Research and Enquiry Section had been added to the MRES and seven more Sections were established in Europe. The administration of these was then organised into three main field units (MREUs), in France, Germany and the Low Countries and by the end of that year there were five such Units covering Europe and the Middle East. Over the course of 1946 and 1947 ten smaller Search Teams tackled Burma, Siam and Indo-China. Enough has been said here I think to indicate the extent and detail of organisations set up to do the necessary work.

Stuart Hadaway is a curator on the staff of the RAF Museum and, as can be expected, his work is of a very good standard. Handling the vast quantity and variety of source data cited required skill and judgement. The author's professionalism avoids the trap, so often fallen into by the less skilled, of including completely indigestible amounts of such stuff. We are given sufficient detail to show clearly the immense scale of the task and the evolution of techniques to acquire the data and then to go on to its analysis. It is true, as implied in the quotation with which I opened this review, that forensic science was relatively undeveloped in the 1940s. However, coroners' courts had a long history and post mortems were certainly not uncommon. In addition the skills of police investigative procedures and those of both historians and lawyers could be drawn upon. The book is illustrated with interesting photographs, by no means all of gravestones, and there are five useful appendices and a good bibliography. Taken with the text, this provision of data could make the book a good starting point for anyone perhaps wishing to do some research of their own into family history. To sum up in more general terms, we have here a fitting tribute to the care and compassion shown by the RAF in dealing with its fallen and with their relatives. I can recommend that you read it, either by purchase if you would like to have it as a work of reference on your own shelves, or as an interesting read in its own right from your local library.

**Dr Tony Mansell**

**Diary Of A Night Bomber Pilot In World War I** by Clive Semple, edited by Wing Commander Alan Mawby. Spellmount, 2008. £25.

It remains a constant surprise that personal accounts of the First World War continue to emerge in print, particularly those describing air operations – in this case, No 207 Sqn's participation (flying Handley Page O/400s) in the Independent Force's strategic bombing campaign against Germany between July and November 1918. We should be grateful that any of this material has survived and that, in turn, it has been made available by publishers such as Spellmount, who have produced a thick and extremely well illustrated book. It has clearly been a labour of love for Clive Semple, Lt Leslie Semple's son, who has toiled assiduously to visit the locations mentioned by his father and to expand on rather thin material. Unfortunately, this is also

the book's fundamental weakness. While the finished product is over 300 pages long, less than 200 are text (the remainder are photographs or illustrations) of which about 40 pages comprise the original diary. Bearing in mind the title of the book, it is surprising to discover that only about a quarter of the diary covers the period on 207 Squadron (ie only ten out of the book's 300 pages). One finds a similar situation with the photographs. Of the 200 included only about 80 are original – the others are largely well known images from sources such as the IWM.

Does any of this really matter? Well I think it does because, in expanding the narrative, the author has included a great deal of extraneous, if not irrelevant, material. More importantly, these excursions significantly weaken the flow while making it difficult to concentrate on the story. For example, we are provided with a page on the spinning characteristics of the Camel by way of expanding on the entry for 10 July 1918 which mentions seeing a Camel spin into the ground at the Pilot's Pool. Similarly, the two-line entry for 25 October 1918, mentioning the death of an anonymous DH9 observer, provides an excuse to include a two-page discourse on the origins and history of the Commonwealth War Graves Commission. Numerous extracts from the *Daily Mail* are included, even an imaginary passage describing a flying lesson at Vendôme. When elaborating on Leslie Semple's period in Crete (at Suda Bay, although this is not mentioned) we are offered some cod history on Arab rights in Palestine. My point is not a political one; it is that such digressions detract from an otherwise interesting account. In short, the book could have been successfully edited to half its current length (with much of the remaining material placed in footnotes) without losing any impact and to the considerable benefit of the reader.

So, what about the content? The actual diary itself is certainly interesting, covering as it does flying training at Cranwell, Vendôme and Stonehenge as well as time at the Pilot's Pool. A minor niggle is that the index is adequate but not comprehensive. There are, for instance, some interesting passages on bombs and bombing (as one might expect) but neither subject features in the index. Considerable effort has clearly been expended in research but it is wrong to suggest (as the dust jacket blurb asserts) that this is a unique record. Paul Bewshers' *Green Balls* (London: William Blackwood, 1919) and

Richard Kingsford's *Night Raiders of the Air* (London: John Hamilton, 1939) immediately come to mind. It is also not the first time that the Lighthouse System for night navigation has been described; Trevor Henshaw's *The War at Night* (Cross & Cockade Journal, Vol 30, No 4, 1999) and William Fischer's *The Development of Military Night Aviation to 1919* (Alabama: Air University Press, 1998) both provide greater detail – as does the Official History. In view of the author's efforts, it is also strange to find that he has apparently not drawn on the accounts of flying training at Cranwell and Vendôme that have been published by Cross & Cockade in recent years.

It is difficult to avoid the conclusion that this is an article masquerading as a book. Whether you should buy it really depends on your taste. If you like a discursive style, and are happy to wander through the broader political, military and social history of the Great War as reflected in an individual's diary, then most of my criticisms are irrelevant. The diary is certainly well worth reading and the original photographs are new and interesting, although at £25 I have to say that it is a high price to pay.

### **AVM Peter Dye**

**Air Force Records** by William Spencer. The National Archives, 2008. £12.99.

This 160-page softback supersedes the broadly similar *RAF Records in the PRO* that appeared in 1994. The new edition is more sharply focused, reflecting its sub-title, *A guide for family historians*, and, perhaps, the fact it has only one author, rather than the four who contributed to its predecessor. That said, do not be misled by that sub-title. While the book's central aim may be to provide advice to genealogists intent on reconstructing the career of an individual who served with any of the flying services, not just the RAF, going right back to the RE and its balloons, it does much more. Tracing someone's Service records inevitably involves excursions into some or all of the London Gazette, medal rolls, citations for awards, information on PoWs and camps, aircraft accident records, courts martial, unit diaries, campaign histories and much else.

If you are not already familiar with Kew, Spencer provides an invaluable introduction into what is available on site and on how to go

about accessing it. More than that, he also summarises the kind of complementary information that is held by other institutions, notably the museums at Hendon, Yeovilton, Lambeth and elsewhere and he provides the contact addresses of the offices currently concerned with the maintenance of records of personnel of all three Services. One word of warning, while this book does provide ample advice on how to trace your granddad's records, there is no guarantee that you will find them; apart from anything else, the information may not have survived and, even if it has, it may be subject to data protection legislation.

There are a couple of slips of the pen, eg a 'Marshall' got past the proof-reader on p67 and something went wrong with a table of comparative ranks on p146, but the only significant error I spotted was on p33 where a photocopy of a page from a file is captioned as the 'nominal roll of the first 55 pilots of the RFC'; it is actually a list, as at 17 August 1914, of the fifty-five commissioned pilots left behind in the UK after the RFC's 105-officer operational echelon had deployed to France. But let us not quibble. I have been a frequent visitor to Kew for forty years and I have a fair grasp of what is and is not available in my particular fields of interest, yet I learned things from this book. If I had not been fortunate enough to have been able to acquire the example offered for review, I would certainly have bought one. If you are planning on going to Kew (even if you are an old hand) it would be well worth investing in a copy; you can pick one up at the bookshop when you get there.

**CGJ**

**Diver! Diver! Diver!** By Brian Cull with Bruce Lander. Grub Street; 2008. £30.

If I describe this book as a typical Brian Cull/Grub Street production that should convey an impression of a well-researched, nicely produced factual account of a specific air campaign. In this case the content is summed up by the sub-title – 'RAF and American Fighter Pilots Battle the V-1 Assault over South East England 1944-45'. The result is a fairly hefty volume running to some 472 pages plus an eight-page insert of relevant photographs – snapshots of pilots, stills from camera gun film and the like. That sub-title sells the content a little short, as the story also covers the *Luftwaffe's* use of

other first-generation missiles/guided weapons, including the Fritz-X and Hs 293 and the rather desperate *Mistel* ‘piggy-back’ concept. Furthermore, the book goes on to provide details of the equally clumsy and unsuccessful American attempts to employ war-weary Fortresses and Liberators as remotely-piloted aircraft packed with explosives and, tucked away among the copious endnotes, there are some facts and figures relating to the US Navy’s more satisfactory experience with the Bat glider bomb in the Pacific where it sank a number of Japanese ships.

In a book of this size there are bound to be one or two typos and a few slips of the pen, eg Air Mshl Roderic Hill is ranked as an AVM on p103; Tempest JN411 should have been JN811 on p130; the reference to ‘F4U Hellcats’ on p255 should have read ‘F4U Corsairs’ and Fg Off H Cook’s name has been omitted on page 424 (against 24-25/9/44). But there are not enough of these double-takes to disturb the flow. My only real complaint, well two really, is to do with maps. The three maps squeezed in on page 383 should, I think, have been given a page each and it would have been useful to have had before-and-after maps to show the early and late dispositions of the lines of defence for London – the ways in which airspace was allocated to the guns, balloons and fighters.

The bulk of the text, about 300 pages, is a day-by-day account of the air activity between mid-June and the end of August 1944. On each date, squadrons are dealt with individually in numerical order with claims tabulated by: pilot’s name; aircraft serial number and (where known) individual code; time and location. In the vast majority of cases these lists are then amplified by a descriptive narrative – a personal recollection, an extract from a Combat Report or an eye-witness account by a civilian. It is here that the occasional Mosquito navigator gets a mention, but all of the tabulated information is summarised at Appendix II where *all* of the navs are identified. Indeed, Appendix II serves as a handy reference to the whole subject, because, apart from listing chronologically *every* claim made by fighters, it also provides overall totals both by squadron and by aircraft type. The author’s totals do not tally exactly with the long-standing ‘official’ figures but he has drawn his facts from a meticulous review of primary sources and I suspect that his ‘recount’ is probably the more accurate version – after all he does cite chapter and verse for

each claim.

Because of the diary format, the main text is bound to be somewhat repetitive and the book is rather heavy going if you try to read it from cover to cover. But I would imagine that most folk will use it as a work of reference, entering at Appendix II and/or the index to personalities (which is helpfully broken down by nationality, RAF (including Commonwealth and Allied personnel), American, Polish, German and, where appropriate further sub-divided into military and civilian) as a means of accessing the passages of particular interest. That said, the lengthier narrative passages are very readable. Extracts for instance, from statements to the House made by the Prime Minister and Herbert Morrison and from speeches by Josef Goebbels, add colour and background and some forty very interesting pages are devoted to the campaign against the V-1s air-launched by He 111s.

‘Definitive’ is an overworked adjective when it comes to historical accounts, but I do not see how anyone will be able to improve on this one. If you need to know how the RAF countered the V-1, it is all here. Since the subject is a little specialised, we are indebted to both the author and the publisher for making it available – and in a very accessible form. Recommended.

**CGJ**

**From North Africa to The Arakan** by Alan McGregor Peart DFC.  
Grub Street; 2008. £20.00.

Peart learned to fly with the RNZAF in New Zealand before travelling, via the USA and Canada, to the UK where, as a sergeant pilot, he flew Spitfires with No 610 Sqn commanded at the time (June 1942) by Johnnie Johnson. In November, after a brief interlude flying night patrols from Gibraltar in a Hurricane, he seems to have more or less ‘posted himself’ to No 81 Sqn at Bône. His apparent desertion was sorted out by the CO and he stayed with the squadron until 1944, moving with them via Malta and Sicily to Italy and then on to India and Burma. As a result, his combat claims (6 + 1 shared destroyed and 9 damaged) included Italian, German and Japanese aircraft.

Peart suffered some periods of bad health and he was taken ill at the end of the North African campaign and again in Sicily when he was hospitalised with malaria. On rejoining the squadron at Gioia del Colle he was judged to be in need of some building up and encouraged

to eat heartily, advice which earned him his enduring nickname of 'Porky'. In November 1943 No 81 Sqn went to India, specifically the Arakan, and it is at this point that the omission of any maps in the book becomes noticeable. Whilst most people have a reasonable grasp of the geographies of Mediterranean countries, and even India, I suspect that many of us are less familiar with the place names associated with the Burma campaigns.

Commissioned by this time, and still flying Spitfires, by now Mk VIIIs, which he liked, Peart was one of a handful of fighter pilots who operated from the jungle strip at 'Broadway', 200 miles behind the Japanese lines, to provide cover for Wingate's second Chindit expedition. At this juncture he gives us a graphic account of a notable action on 17 March 1944 in which he and the CO took on some twenty *Oscars*. In the engagement that followed, which he describes as '... a mêlée of mad flying on my part with no chance of hitting back' (although he was credited with shooting down one of the intruders) Sqn Ldr Whitmore was shot down. Peart's survival was attributable to the robustness of his Spitfire which stood up to the treatment to which it was subjected, its airframe sustaining significant damage – from the rough handling, rather than Japanese bullets.

Having participated in the air defence of Imphal and Kohima, his long stint of combat flying came to an end in August 1944 when No 81 Sqn was withdrawn to Ceylon. Now suffering from bad leg ulcers and impetigo he was posted away, 'given the boot' as he puts it, to Poona. There he was to spend three months instructing in fighter techniques, punctuated by periods in hospital to deal with recurrent bouts of dysentery. Having been awarded a well-earned DFC in June 1944, Peart was eventually repatriated to New Zealand early in 1945. Posted to CFS Woodburn to become an instructor, the war ended before he could do any instructing himself and he left the Service not long afterwards. It took him some time to recover his health and to re-integrate into civilian life but, when fit again, he completed his engineering degree and went on to a successful career as a civil engineer 'thanking the Lord for an exciting and very fulfilling life.'

His book is densely packed with incidents, far too many to detail here, and full of interest for both lay and/or professional readers. What we get is a lucid account of the author's life and actions in the air and on the ground. He writes fluently and comments in an informed

manner on the nature of aerial warfare as he experienced it, of Service life and of the environments in which he found himself. Where Service life is concerned he seems at times to have been some sort of free-floating entity, as when he posted himself to Bône and when the RNZAF failed to pay him for the whole of the time he was in India, leaving him to subsist there on two special allowances for aircrew serving in the Far East. In the context of environments he says that nothing else in his experience could compare with the terrible flying conditions, the severe climate and the multiple diseases to which men were exposed in the Far East. So, in providing tales of the Burmese theatre, that of the so-called 'Forgotten War', Peart has made a valuable contribution to our knowledge of what went on there. Finally, he has provided, in an Appendix, his well-informed (through hands-on experience) thoughts on aerial marksmanship – and these alone are probably worth the asking price. I am glad to have a copy of his book on my shelves and I can certainly recommend it to others.

**Dr Tony Mansell**

**With Wings Like Eagles – A History of the Battle of Britain** by Michael Korda. Harper Collins; 2009. \$25.99 (available in the UK later in 2009)

Michael Korda, scion of the renowned film-making dynasty of the 1930s and '40s, served for two years in the Royal Air Force as a young man and clearly retains a great regard for the Service. A long-time resident in New York, his latest book (a 322-page hardback with 40 b/w and 5 colour plates) is plainly written for the United States market, as may be detected in some of its punctuation and spelling. Korda paints a full picture of the years leading up to the Battle of Britain and of the Battle itself that is faithful to most generally accepted views of events. He has a pleasing, highly readable style which, if placed on a continuum running from broadsheet to tabloid, would settle somewhere about the *Daily Mail* or *Daily Express* point on that scale.

Michael Korda has produced a book that reaches what most would regard as broadly the right conclusions, notably in his judgements about Dowding whom he credits rightly with the creation of the air defence system, without which success would have eluded Fighter Command in 1940. He offers a controversial view of Dowding's

relationship with Churchill, hinting that the latter's account of events, in *Their Finest Hour*, Volume II of *The Second World War*, was crafted to suggest support when little had existed at the time of Dowding's removal. Indeed, he is plainly sceptical of the objectivity of Churchill's *magnum opus* itself.

Michael Korda also places an interesting construction on the tactical handling of the Battle, suggesting that it was Dowding's aim to conceal the true size of his fighter force, by fielding squadrons singly, rather than in greater strength. It is here that the author displays an imperfect understanding of the degree of centralisation of control in the Dowding System. His description suggests that the Battle was controlled direct from Bentley Priory and its 'Filter Room' (*sic*). He has a shaky grasp of the relationship of HQ Fighter Command and its subordinate Groups and their Sectors. This is a pretty fundamental criticism of the quality of the research behind this book, the accuracy of which is repeatedly seen to be flawed in errors of detail, of which there are many.

Errors of detail, reliance on a pretty thin bibliography, the absence of primary sources – all these suggest that this very readable book is not by any means a major historical work. Nonetheless, it provides a good overview of the Battle and its origins and is ideally suited to its intended readership who will enjoy the odd well-deserved swipe at Brit stereotypes. I cannot resist referring to a recent review of this book in a distinguished American daily newspaper, in which Dowding drew praise for having laid 'the foundations for a solid air defense: a network of radar stations, an all-volunteer observer corps, a well fortified operations room at RAF headquarters, and a ready fleet of *fighter jets...*' That said, I would be as likely to refer to the use of tanks in the American Civil War, were I to review a book on that conflict!

### **AVM Sandy Hunter**

**No 485 (NZ) Squadron 1941-1945** by Paul Sortehaug and Phil Listemann. [www.raf-in-combat.com](http://www.raf-in-combat.com) ; 2006. 18€

This history of No 485 Sqn is an example of a relatively new series of softbacks dedicated to individual RAF units. This one contains, as they all do, a narrative account supported by numerous appendices tabulating, in considerable detail, an operational diary, claims and

losses (including accidental), awards, sundry maps and a brief note on each of the more than 200 pilots who flew with the squadron. All of this data, and much more, is backed up by about 100 photographs and eight colour profiles and presented in just 90 (approx  $9\frac{1}{2} \times 6\frac{1}{2}$  inch) pages. In other words, it is a real quart-into-a-pint-pot exercise and one which the publisher has pulled off with considerable success, and with no concessions to quality, as the paper used is glossy throughout and features colour wherever appropriate.

There are some instances of clumsy expression within the narrative and there are a few spelling mistakes – or perhaps typos – which might have been avoided by just one more reading of the galleys. While I can live with this sort of thing, there one or two other points that are more significant. There is, for instance, a reference to the ‘Griffon-engined’ Spitfire XVI which should have read ‘Packard Merlin-engined’. I have no doubt whatsoever that the author(s) are well aware of the difference and that this was merely an oversight, but, as such, it was avoidable. Then again, I would have to take issue with the statement that No 85 Gp was relegated to maintenance and training from October 1944 – true, in part, but it did retain a substantial operational commitment and continued to provide 2nd TAF’s night defence until the end of the war. If I had to make a real criticism, however, it would be the total lack of recognition afforded to the unit’s groundcrew – these books are all about the pilots. Nothing wrong with that, of course, but they didn’t do it all by themselves and a *squadron* history really ought to make some mention of its support element, even when this was a quasi-independent Servicing Echelon.

New titles in this series appear rather erratically and have thus far tended to focus on the less well-known ‘WW II-only’ fighter units, including Nos 71, 310, 312 and 457 Sqns, although other titles are in preparation and the series has also featured the longer-lived No 501 Sqn – this one runs to 137 pages, although less than two of these are devoted to the squadron’s pre- and post-war activities.

Oddly enough, while all of these books are written in English, they are actually published in France (hence the price being quoted in euros) and they may prove to be a little difficult to track down in the UK. That said, they are available at one or two of the specialist aviation book dealers and they can be ordered direct via the

publisher's website. I fancy that, unless the publisher reissues them, these very worthwhile booklets may well become collectors' items because some are already out of print and the second-hand price is starting to climb.

The histories of individual RAF squadrons (or, to be pedantically inclusive, squadrons which flew with the RAF) are slowly, very slowly, appearing in print but the majority still languish in the relative obscurity of official archives. Notwithstanding any of my earlier observations, by making the exploits of additional units more accessible, this series makes a significant contribution to the recording of the annals of the RAF – and at a very reasonable price.

**CGJ**

**Bader's Last Flight** by Andy Saunders. Grub Street; 2007. £16.99.

At 1115 hrs on 9 August 1941, five Blenheims and 180 Spitfires of Circus 68 crossed the French coast. Five RAF pilots, including the Leader of the Tangmere Wing, Douglas Bader, failed to return. Already an icon, Bader's collision with a Messerschmitt 109, which resulted in his aircraft losing its tail, obliging him to parachute into captivity, would later be immortalised on film, in print and on canvas. However, this widely accepted version of Bader's demise is challenged by Andy Saunders in his latest book: *Bader's Last Flight: An In-depth Investigation of a Great WW II Mystery*.

Saunders originally expressed his doubts as long ago as 2003 and three years later his contention became the basis for a TV documentary on Channel 4. This book is the latest iteration of his theory. Any writer re-examining a legend such as Bader's risks being accused of 'revisionism' and of undermining the reputation of a wartime hero, the more so when the events occurred within living memory. Yet Saunders tactfully analyses the historical evidence and tries to separate myth from verity. The result is a polemic book of very wide interest on many levels.

Perhaps wisely, Saunders largely avoids analysing Bader's character and maintains an objective approach. As many members will know, Bader was a controversial figure. Ill-disciplined and egotistical, yet strong-willed and utterly fearless, he was, by some accounts, loathed as much as loved by the men he commanded. However, in the darkest hours of WW II, when Britain stood alone, he was the man of

the moment and a personification of determination to succeed against overwhelming odds. With this complex personality, Bader achieved things that lesser men could not, both during and after the war.

Although, at 160 pages, the book is relatively short, it manages to cover the events surrounding Bader's loss in just the right amount of detail to maintain the reader's interest. It sets the scene by describing the aim of the Circus concept, explaining how, following the Battle of Britain, the new AOC 11 Group, Leigh-Mallory, employed the principles of 'offensive action' and 'concentration of force' and took the battle to the enemy in an extension of his controversial 'Big Wing' concept. The aim was not 'control of the air' *per se*, but rather to reduce the *Luftwaffe's* fighter strength north of the Seine – Adolf Galland's *Jagdgeschwader* 26. However, this placed Fighter Command at the same tactical disadvantage as the *Luftwaffe* had been during the Battle of Britain – operating at long range over enemy territory where the enemy could choose to accept battle only when it had an advantage. The results were heavy RAF losses. Yet, at the strategic level, the Circuses successfully demonstrated Britain's ability to conduct offensive operations, making it clear to potential allies that the UK was far from beaten and was still a cause worth supporting.

The book illustrates how the 'fog of war' can complicate assessing progress during an air campaign. Circus 68 claimed twenty-one enemy aircraft definitely or probably destroyed. In fact, the *Luftwaffe* lost only one aircraft. Indeed, Saunders highlights the endemic culture of over-claiming associated with specific Spitfire squadrons. Similarly, the *Luftwaffe* claimed seven Spitfires, whereas Saunders concludes that only two Spitfires were lost to enemy fighters.

The media have been quick to make headlines of 'blue-on-blue' fratricide in recent campaigns. This book makes the point that 'friendly fire' is nothing new, concluding that, of the five RAF pilots who failed to return from Circus 68, three had fallen to the guns of other Spitfires.

On another level, the book reveals how myths can develop from very limited information. Saunders describes how the legend of Bader's demise appears to be based on little substantiated evidence, other than the hero's own description of events, and points out that Bader's account actually changed over time. In his excellent book, *The First and the Last*, Galland describes how, when Bader was

brought to his headquarters shortly after his capture, he wanted to meet the pilot who had shot him down. Yet in his foreword to some editions of Galland's book, Bader describes his 'mid-air collision'. When interviewed in 1989, 'Johnnie' Johnson, who flew on Circus 68 with 616 Squadron, stated that Bader 'hated the idea that anyone shot him down'. Much later, in 1982, when Bader was the subject of a *This is Your Life* TV show, he jokingly remarked of his wingman, 'I think he shot me down!'

Saunders has used an eclectic mix of archival analysis of both British and German records, interviews and archaeological excavation to support his thesis that Bader was most probably the victim of friendly fire. The book reveals how a pilot from Bader's wing shot the tail off 'an Me 109' before falling prey to another Messerschmitt and becoming a POW himself. Saunders excavated the crash site of the only Bf 109 lost during Circus 68 and found its tail intact; the only aircraft known to have lost its tail was Bader's . . .

In his conclusion, Saunders acknowledges the brave and courageous fliers of Circus 68 and admits that he can reach no definitive conclusion; he merely offers a credible interpretation. Whatever your opinion of Douglas Bader, this book is a welcome addition to the historical debate. I recommend it.

**Wg Cdr Andy Walters**

**Though Without Anger** by Colin Cummings. Nimbus Publishing (October House, Yelvertoft, NN6 6LF), 2008. £22.00.

Members may already be aware of Colin Cummings' five-volume series that provides details of all RAF aircraft lost, globally, due to accidents in the air and on the ground between VE-Day and 1996. Bill Chorley has chronicled all of Bomber Command's wartime losses (both in combat and through flying accidents at training units); Norman Franks has covered wartime losses sustained by the squadrons of Fighter Command while Ross McNeill, David Gunby and Pelham Temple have made a start on Coastal Command, the Middle East and the Mediterranean. *Though Without Anger* fills another gap in the record by chronicling losses of transport and special duties aircraft and assault gliders, world-wide, between 1940 and 1945. The result is a hefty, 638-page, A5 softback. Each of the, more than 1,000, entries provides the date, unit, aircraft type and serial

number, the location, a brief account of the incident and identifies any fatalities. It really could not be much more comprehensive than that. When it came to gliders, however, even the indefatigable Cummings had to admit defeat. While the specific details of gliders lost on routine flights and at Arnhem have been provided, because they were ultimately expendable, record keeping appears to have been less painstaking on other occasions. Even so, all gliders written off on other operations are noted in one appendix, along with the date of their demise, and all fatalities associated with those losses are listed in another but it has not been possible to match these personnel with individual gliders.

The commercial potential of books of this nature must, I imagine, be relatively limited because they are somewhat esoteric and are thus likely to appeal to a niche market rather than the general reader. But for the folk who inhabit that niche, they are absolutely invaluable. Clearly, the raw information is out there, after all these authors have managed to dig it out, but by making it readily available in an easily assimilated form it has made the task of other writers so much easier. We need people like Colin Cummings to do the spadework for us, and we need to buy their books in order to encourage them to do it again. Recommended.

**CGJ**

*Note. Owing to mismanagement on my part, two Society members were commissioned to review the next book. Since both took the trouble to do so, both of their opinions are offered here. Ed*

**Drop Zone Burma – Adventures in Allied Air-Supply 1943-45** by Roger Annett. Pen & Sword, 2008. £19.99.

Annett's debut book was the very entertaining and evocative *Drop Zone Borneo*, a personal memoir of flying in the Far East in the mid-1960s. Now the one-time RAF transport pilot has focused on air supply operations in an earlier era – WW II. This latest offering is based on the memories of twelve veterans of the Burma campaign: three RAF Dakota aircrew, four RAF groundcrew (three of whom flew as air dispatchers), three infantrymen, and a signaller – together with no less a personality than Dame Vera Lynn

Annett looks at how each Serviceman came to be in the forces and then takes their various experiences, laced with his own historical

commentary, to trace the ebb and flow of war in Burma. We hear what it was like to be a ‘squaddie’ on the ground receiving re-supply from the air: ‘We had your lot dropping bullets and bully beef to us on parachutes. Marvellous that was.’ What it was like to fly the Dakota on operations: ‘It was a terrifically robust aeroplane. We were often hit by gunfire and landed with bullet holes in the airframe – once we got a hole as big as your fist from a mortar shell.’ And what it was like to be a dispatcher on the Dakota: ‘The dispatchers would manhandle the first of the packs, chute on top, and weighing in at well over 100 lbs, to the sill of the door – always open, ready to go. [...] At the green light, it was time to heave, the man at the back shoving with every ounce of strength his legs could muster, and out the pack would shoot into the slipstream.’ A real scoop, which adds another charming dimension to the book, are Vera Lynn’s recollections of travelling to Burma and singing to the boys in a war zone. Her piano made a unique piece of air freight!

The result is a personal and chronological record of a gruelling and long-lasting campaign that so nearly ended in disaster and the spectre of the Japanese knocking at the gates of India. The author highlights the Allies’ success in developing air supply, to which the Japanese, with their overstretched lines of communication, ultimately had no answer. Not for nothing did Field Marshal William Slim title his own classic account of the campaign *Defeat into Victory*. While this is an unashamedly ‘feel good’ book, Annett’s warm, engaging style vividly portrays the hardships and the humour of the times and makes a delightful read for layman and historian alike.

### **Sqn Ldr Tony Fairbairn**

The author’s first book, *Drop Zone Borneo*, described his personal experiences flying tactical transport sorties during the ‘Confrontation’ period of the 1960s. For his second venture, Roger Annett sets out to describe the previous generation’s efforts during the Burma campaign.

As a framework, Annett uses the recollections of a dozen veterans; aircrew, ground staff and soldiers, together with an input from Dame Vera Lynn. Their stories are then, where possible, interwoven although for the most part the subjects did not meet or serve in the same units. Annett also includes in his story some aspects of his own

research and – lucky chap – tells us of his flight in a Dakota of The Battle of Britain Memorial Flight. The account is enhanced with contextual information about the military situation which obtained in Burma and the Far East during this time. The final part of the book tells us how the veterans rebuilt their lives after the war. The whole is illustrated with three maps and two sections of monochrome photographs, depicting the book's subjects and some of various aspects of wartime life in Burma. The book is hardback and runs to 213 pages, including a comprehensive index.

The book is a good read but in trying to deal with the dozen subjects plus Dame Vera, the chronology of the account gets a bit confusing and the reader needs to bear this in mind. It is a general account of the lives of some ordinary service people who came from many different backgrounds and participated in one of the least glamorous theatres of the war; not for nothing was this the theatre of the 'Forgotten Army' – and air force.

Where the book disappoints is that it does not deliver on its title. The story of the work of the four main Dakota squadrons is barely touched and certainly not in any serious detail. The two Canadian squadrons are completely neglected and furthermore, the work of the Dakotas and Liberators undertaking the special duties work and dropping supplies and agents, not just in Burma but throughout the theatre, go without mention.

In summary, a good account of the experiences of a small group of soldiers and airmen but not a book for the serious student of air transport operations.

**Wg Cdr Colin Cummings**

## **ROYAL AIR FORCE HISTORICAL SOCIETY**

The Royal Air Force has been in existence for almost ninety years; the study of its history is deepening, and continues to be the subject of published works of consequence. Fresh attention is being given to the strategic assumptions under which military air power was first created and which largely determined policy and operations in both World Wars, the 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 £18 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)

### THE TWO AIR FORCES AWARD

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

1996	Sqn Ldr P C Emmett PhD MSc BSc CEng MIEE
1997	Wg Cdr M P Brzezicki MPhil MIL
1998	Wg Cdr P J Daybell MBE MA BA
1999	Sqn Ldr S P Harpum MSc BSc MILT
2000	Sqn Ldr A W Riches MA
2001	Sqn Ldr C H Goss MA
2002	Sqn Ldr S I Richards BSc
2003	Wg Cdr T M Webster MB BS MRCGP MRaES
2004	Sqn Ldr S Gardner MA MPhil
2005	Wg Cdr S D Ellard MSc BSc CEng MRaES MBCS
2007	Wg Cdr H Smyth DFC RAF

### THE AIR LEAGUE GOLD MEDAL

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

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

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